

MEETING OF THE PREPARATORY COMMITTEE
OF THE INDEPENDENT WORLD COMMISSION
FOR THE OCEANS

Lisbon, Portugal

30 June 1995

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Adoption of Agenda

The Provisional Agenda placed below may be adopted by the Preparatory Committee with such amendments as the Committee may consider necessary.

- Item 1: Adoption of Agenda
- Item 2: Opportunity and feasibility of establishing an Independent World Ocean Commission
- Item 3: Approval of Terms of Reference
- Item 4: Consideration and approval of procedures to be followed by the Commission

- Item 5: Supporting structures (Office of the President, Secretariat) and arrangements for the preparation of position papers to be commissioned, etc.
- Item 6: Proposed Action Calendar
- Item 7: Preliminary consideration on the table of contents of the final report
- Item 8: Proposed Budget for 1995-1998 and related aspects of supporting and servicing systems to be adopted
- Item 9: Membership of the Commission
- Item 10: Proposed agenda for the first meeting of the Executive Committee of the Commission
- Item 11: Proposed agenda for the first Plenary Session of the Commission
- Item 12: Other matters.

Approval of terms of reference of the
Independent World Commission

Suggested terms of reference of the Independent World on the Oceans are placed below.

Terms of reference

- . to focus world attention and to generate public awareness on the importance of sustainable ocean and coastal development and the law of the sea;
- . to monitor the ratification, implementation, and progressive development of the United Nations Convention on the Law of the Sea, at national regional and global levels;
- . to examine whether States, especially developing countries, are able to fulfil their duties, enjoy their rights and generate benefits under the Convention, to analyze the difficulties they might encounter, and to propose ways and means to overcome them;
- . to assess the implementation of relevant outcomes of the United Nations Conference on Environment and Development, particularly of Chapter 17 of Agenda 21, at national, regional and global levels, and interactions with the Convention;
- . to follow the development of global and regional programmes of cooperation and development in marine sector and examine how they can be adjusted and further enhanced, in order to respond to the new requirements of integrated ocean management and sustainable development;
- . to examine the role of the Law of the Sea and ocean development in the process of restructuring the United Nations system as a whole for the 21st. century and elaborate proposals to strengthen this role.

The Committee may approve the Terms of Reference with such amendments as are considered necessary.

Consideration and approval of the procedures
to be followed by the Commission

The Independent World Commission on the Oceans (hereinafter the "Commission") will be established for focussing world attention and to generate public awarness on sustainable ocean development and the Law of the Sea and related aspects of international cooperation. The Commission has to establish its own procedure.

The following suggestions are for the preparatory Committee's consideration and approval with such changes as are deemed necessary.

The Independent World Commission on the
Oceans

1. The purpose of the World Commission on the Oceans (hereinafter the Commisssion) is to prepare and issue a report and make recommendations to the international community on the matters under its Terms of Reference
2. The Commission will consist of about 30 Members including a Chairman and 6 Vice Chairmen
3. Honorary Members - Sponsors
4. Eminent Persons may be invited to make their contributions to the work of the Commission.

5. The Chairman, Vice Chairman and the General Coordinator shall constitute the Executive Committee of the Commission.

6. Membership of the Commission is determined by resignation.

Executive Committee

7. The Executive Committee (hereinafter the "Committee") shall determine policy regarding activities, organisation, financing and administration of the Commission.

8. The Committee shall establish and maintain a Trust Fund whose monies shall consist of:

- grants and donations;
- acquisition through testamentary disposition, legacy or endowment;
- any other acquisition.

9. The monies in the Trust Fund shall be applied to the activities of the Commission in accordance with the budget approved by the Executive Committee. The Committee shall appoint the Treasurer from among the Vice-Chairman.

10. The Committee shall appoint the Executive Secretary to the Commission. The Executive Secretary shall be the chief executive officer of the Commission and be responsible to the President and the Executive Committee. He will be an ex-officio member of the Commission.

11. The Executive Secretary shall have executive and administrative authority for the implementation of the policies and decisions established by the Committee and under empowerment by the Chairman.
12. The Executive Secretary can, under authority of the Chairman, establish contracts for work to be undertaken for the Commission.
13. The Executive Secretary and the Trespure can jointly open and close bank accounts, sign cheques and carry our other transactions within the limits and conditions determined by the Committee.
14. Within six months of the close of the financial year, which would run from January first up to and including December thirty-first, the Executive Secretary shall draw up a financial statement covering the proceding year and the Treasurer shall submit the same for approval of the Committee.
15. The Committee shall appoint an independent auditor for the purpose of supervising the book-keeping regulary and to report to the Committee with regard to the financial statement.

Meetings of the Commission and Executive Committee

16. The Commission and Committee shall meeť regularly at least once a year. Additional meeting shall be held when the Chairman finds it appropriate.
17. The Chairman, and in his absence a Member of the Committee appointed by him, will preside over meeting of the Commission and of the Committee.

18. The meeting shall be convened by the Executive Secretary at least 20 working days prior to the date of the meeting along with a Provisional Annotated Agenda.
Provided that when the Chairman finds it appropriate he may reduce the 20 days time period.
19. The record of discussion of Commission and Committee meeting shall be kept by the Executive Secretary and approved by the presiding officer.

Dissolution of the Commission

20. The Committee is authorised to take the decision to dissolve the Commission.
21. After the decision of the dissolution, the Commission will continue to exist in so far as such is necessary for the liquidation of its affairs by the Executive Committee.
22. After the debts have been paid, the Executive Committee shall determine the allocation of the remaining assets of the Commission.

Brief on action calender

The proposed action calender is at pages.

The Preparatory Committee may approve the action calender with such modifications as are considered necessary.

The Preparatory Committee may also like to fix dates for the Plenary meeting of the Commission proposed to be held in 1995 from 4 - 6 September in Japan. The Committee may also like to approve the meeting of the Executive Committee of the Commission in Tokyo on 3 September, 1995 and the conducting of thematic and regional hearing.

The main tasks before the Commission would be to:

- announcement of the establishment of the Commission to the Fiftieth Session of the UN General Assembly;
- submit a progress report to the UN Commission on Sustainable Development, in summer 1996;
- finalise the Report of the Commission in 1997 and submission to the 51st Session of U.N. General Assembly;
- presentation of the Report, at an high level meeting ("Ocean and Society at the Threshold of the Third Milenium") in Lisbon, as part of the programme for 1998 - International Year of the Oceans.

1995

The time table for 1995 could be as follows:

- I) Mobilising funds and other forms of support;
- II) Establishing servicing structures and initiating preparation for thematic and regional hearings and consultations
- III) Meeting of Executive Committee - Tokyo 3 Sept.1995
- IV) Plenary Session - Tokyo - 4/6 Sept.1995
- V) Thematic and Regional hearings Oct./Dec.1995
First half 96

Thematic and Regional hearings will be organised from October 1995 and pursued in the first half of 1996.

A suggested action calendar for the regional hearing could be as under:

Item	Action	Date	Responsible Party
1.1	Avertise setting up of the Commission in the region	October 1995	Vice-Chairmen and arrangements to be decided
1.2	Write to various regional organisations regarding format, modus operandi and arrangements for Regional hearings	October/ /December 1995	Vice-Chairmen and arrangements to be decided

1.3	Organise regional hearings	January/June 1996	Concerned Vice-Chairmen and Regional Organisation concerned (e.g. IOI, IOMAC)
1.4	Summarise hearing and other inputs; elaborating recommendations to be submit to the Secretariat	April to October 1996	Concerned Vice-Chairman, Regional Organisers and Secretariat
1.5	Progress report and other information will be circulate when available to all members of the Commission	1996 as soon as possible after preparation	Chairman and Secretary to the Commission

As would be seen from the above time table, the concerned Vice-Chairmen would supervise and guide the finalisation of the reports emanating from the Regional hearings. The allocation could perhaps be as follows:

Vice President

Prof. Elisabeth Mann Borgese - North Hemisphere

Prof. Guido de Marco - Mediterraneo

Amb. José Israel Vargas - Central and South America

Mr. Yoshio Suzuki - Asia

Amb. Layashi Yaker - Africa

1996, 1997 and 1998

In 1996 the Commission would pursue regional and thematic hearings. It should also present the Commission's views to the Commission on Sustainable Development (CSD) at its summer session (1996) as the CSD would be considering the sustainable development of the oceans. There could be two plenary meetings of the Commission and four meetings of the Executive Committee in 1996. The detailed time table and work plan would be submitted in September 1995. Monaco has agreed to host a Plenary in early 1996. In 1997 the Commission would finalise its Report which would be released in 1998 (the International Year of the Ocean) and, possibly presented at an high level Conference, in Lisbon, in the context of EXPO 98, "The Oceans - An Heritage for the Future". There could be two plenary meetings of the Commission and four meetings of the Executive Committee in 1997 and two meetings of the Executive Committee in 1998. Detailed workplans and time tables would be submitted in 1996 and 1997.

Preliminarily suggestions regarding the table of contents
of the Final Report

The draft table of contents of the final report placed below for preliminary consideration.

Draft table of contents

1. Introduction. Changing global system. Increase in number of actors - States, NGOs, TNCs, media, citizens' groups and associations. Interdependence of issues, emergence of technological and institutional "gaps" due to High Technology, rise of environmental issues; issues of poverty, unemployment, gender, youth, indigenous people. The U.N. Special Conferences, in the wake of the Rio, 1992, Conference: their conclusions, recommendations, and consequences. Economic disequilibria and their impact on security. The changing concept of security and its implications.

2. Sustainability - the concept and its economic, political, cultural and social consequences. Sustainable development of marine resources - fish, food, water, drugs, energy, minerals, shipping, space, recreation; their place in the global economy (seventy percent of international trade; fifty percent of tourism; coastal development). Increasing population pressure on coastal areas and its environmental impact. Islands development.

3. Legal issues, including
 - . interlinkages between Law of the Sea Convention, UNCED Conventions on Biodiversity and Climate Change, 1959 Antarctic Treaty, and Agenda 21;

gaps in the form of national legislations and regional protocols.

4. Science and Technology. The science of planetary systems (GOOS, ecosystems, study of geosphere and biosphere) and High Technology. Cooperative and other mechanisms for involving the developing countries - national, regional, global: New approaches to "technology transfer" in the age of high technology.
5. Institutional requirements at national, regional, and international levels. Institutional mechanisms for the development of integrated policies and cooperative ventures, at national, regional, and international level.
6. Ocean governance and the restructuring of the international system, including the U.N. system and the place of the new actors therein.
7. Conclusions and action-oriented recommendations, including financial implications and ways of dealing with them.

Finalisation of membership of the
Independent World Commission for the Oceans

A proposal for membership which should be around 30, will be submitted for consideration to the Preparatory Committee. Final composition shall take into account the need to cover, collectively, matters concerning UNCLOS, UNCED (Agenda 21, Chapter 17), international cooperation in ocean affairs, marine sciences and technologies, uses and management, capacity building as well as a balanced regional representation.

A number of Eminent Persons could be invited to particular Sessions, or part thereof, in the context of their competence on particular subjects.

The Provisional List of Members needs to be revised by the Committee.

Actions by the Preparatory Committee

The Preparatory Committee is invited to consider alternatives I, II, III (submitted by the informal consultations in Paris) and IV (submitted by the staff of the Presidency), from the view point of:

- (I) the alternative supportings structures, including secretariat and related arrangements.
- (II) Funding regarding both the support to the Commission as a whole (e.g. logistics including Secretariat, functioning, contracts for the preparation of backgown reviews/studies, regional and thematic hearings and consultations.
- (III) the strategy to be followed in raising funds, including identification of funding and donor agencies.
- (IV) the desirability to establish a Sponsors Committee or Group.

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ANNEXES

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Approval of terms of reference of
the World Commission

Suggested terms of reference of the Independent World on the Oceans are placed below.

Terms of reference

- . to focus world attention on the importance of sustainable ocean development and the law of the sea;
- . to monitor the ratification, implementation, and progressive development of the Convention, at national, regional and global levels;
- . to examine whether States, especially developing countries, are able to fulfil their duties, enjoy their rights and generate their benefits under the Convention, to analyze the difficulties they might encounter, and to propose ways and means to overcome them;
- . to assess the implementation of Chapter 17 of Agenda 21, at national, regional and global levels and to observe the functioning of the Convention in this process (legal framework; peaceful settlement of disputes; enforcement);
- . to follow the development of regional programmes of cooperation and development in the marine sector and examine how they can be adjusted to the new requirements of integrated ocean management and sustainable development;
- . to examine the role of the Law of the Sea and ocean development in the process of restructuring the United Nations system as a whole for the 21st century and elaborate proposals to strengthen this role

The Committee may approve the terms of reference with such amendments as are considered necessary.

Consideration and approval of the procedures
to be followed by the Commission

The Independent World Commission on the Oceans (hereinafter the "Commission") will be established for focussing world attention on sustainable ocean development and the Law of the Sea. The Commission has to establish its own procedure.

The following suggestions are for the Committee's consideration and approval with such changes as are deemed necessary.

The Independent World Commission on the
Oceans

1. The purpose of the World Commission on the Oceans (hereinafter the Commission) is to issue a report and make recommendations to the international community on the following matters:

- . to focus world attention on the importance of sustainable ocean development and the law of the sea;
- . to monitor the ratification, implementation, and progressive development of the Convention, at national, regional and global levels;
- . to examine whether States, especially developing countries, are able to fulfil their duties, enjoy their rights and generate their benefits under the Convention, to analyze the difficulties they might encounter, and to propose ways and means to overcome them;
- . to assess the implementation of Chapter 17 of Agenda 21, at national, regional and global levels and to observe the functioning of the Convention in this process (legal framework; peaceful settlement of disputes; enforcement);
- . to follow the development of regional programmes of cooperation and development in the marine sector and examine how they can be adjusted to the new requirements of integrated ocean management and sustainable development;
- . to examine the role of the Law of the Sea and ocean development in the process of restructuring the United Nations system as a whole for the 21st century and elaborate proposals to strengthen this role

as well as to undertake all that which is related to the foregoing in the widest sense.

2. The Commission will consist of not more than 30 Members including a Chairman and not more than 6 Vice Chairmen.
3. Honorary Members (?).
4. Eminent Persons may be invited to make their contributions to the work of the Commission.

5. The Chairman and Vice Chairmen shall constitute the Executive Committee of the Commission.
6. Membership of the Commission is terminated by resignation.

Executive Committee

7. The Executive Committee shall determine policy regarding activities, organisation and financial administration of the Commission.
8. The Executive Committee shall establish and maintain a Trust Fund whose monies shall consist of:
 - grants and donations
 - acquisition through testamentary disposition, legacy or endowment
 - any other acquisition.
9. The monies in the Trust Fund shall be applied to the activities of the Commission and in accordance with the budget approved by the Executive Committee. The Committee shall appoint the Treasurer.
10. The Executive Committee shall appoint the Secretary to the Commission. The Secretary shall be the chief executive officer of the Commission and be responsible to the Chairman and the Executive Committee. He will be an ex-officio member of the Commission.
11. The Secretary shall have executive and administrative authority for the implementation of the policies and decisions established by the Executive Committee and under empowerment by the Chairman.
12. The Secretary can under authority of the Chairman offer contracts for work to be undertaken for the Commission.
13. The Secretary and a Trustee can jointly open and close bank accounts, sign cheques and carry out other transactions within the limits and conditions determined by the Committee.
14. Within six months of the close of the financial year, which would run from January first up to and including December thirty-first, the Secretary shall draw up a financial statement covering the preceding year and the Treasurer shall submit the same for approval of the Committee.
15. The Committee shall appoint an independent auditor for the purpose of supervising the book-keeping regularly and to report to the Committee with regard to the financial statement.

Meetings of the Commission and Executive Committee

16. The Commission and Executive Committee shall meet regularly at least once a year. Additional meetings shall be held when the Chairman finds it appropriate.
17. The Chairman, and in his absence the Vice Chairman appointed by him, will preside over meetings of the Commission and Executive Committee.
18. The meeting shall be convened by the Secretary by the fastest possible means of intimating the Commission/Committee members at least 20 working days prior to the date of the meeting along with an annotated agenda.

Provided that when the Chairman finds it appropriate he may reduce the 20 days time period.
19. The record of discussion of Commission and Committee meetings shall be kept by the Secretary and approved by the presiding officer.

Dissolution of the Commission

20. The Executive Committee is authorised to take the decision to dissolve the Commission.
21. After the decision of the dissolution, the Commission will continue to exist in so far as such is necessary for the liquidation of its affairs by the Executive Committee.
22. After the debts have been paid, the Executive Committee shall determine the allocation of the remaining assets of the Commission.

Brief on action calendar

The proposed action calendar is at pages 8-10.

The Committee may approve the action calendar with such modifications as are considered necessary.

The Committee may also like to confirm the dates for the Plenary meeting of the Commission proposed to be held from 6-8 September, 1995 in Japan. The Committee may also like to approve the meeting of the Executive Committee of the Commission in Tokyo on 5 September, 1995 and the conducting of regional hearings from August, 1995 onwards.

Proposed Action Calendar

The Commission's terms of reference are:

- . to focus world attention on the importance of sustainable ocean development and the law of the sea;
- . to monitor the ratification, implementation, and progressive development of the Convention, at national, regional and global levels;
- . to examine whether States, especially developing countries, are able to fulfil their duties, enjoy their rights and generate their benefits under the Convention, to analyze the difficulties they might encounter, and to propose ways and means to overcome them;
- . to assess the implementation of Chapter 17 of Agenda 21, at national, regional and global levels and to observe the functioning of the Convention in this process (legal framework; peaceful settlement of disputes; enforcement);
- . to follow the development of regional programmes of cooperation and development in the marine sector and examine how they can be adjusted to the new requirements of integrated ocean management and sustainable development;
- . to examine the role of the Law of the Sea and ocean development in the process of restructuring the United Nations system as a whole for the 21st century and elaborate proposals to strengthen this role

The main tasks before the Commission would be to:

- submit an information report to the Fiftieth Session of the UN General Assembly;
- submit recommendations to the Commission on Sustainable Development in April 1996;
- finalise the Report of the Commission in 1997;
- release the Report in 1998 (the Year of the Oceans).

1995.

The time table for 1995 could be as follows:

Regional hearings	July-December, 1995
Meeting of Executive Committee, Tokyo	5 September, 1995
Plenary Session, Tokyo	6-8 September, 1995

The IOI regional centres would organise the regional hearings in July/December, 1995, summarise the results of such hearings and submit a report to headquarters. They could also make an interim report and submit in time for the Plenary Session to be held in Tokyo in September.

A suggested action calendar for the regional hearings could be as under:

Item	Action	Date	Responsible Party
1.1	Advertise setting up of the Commission in the region	July, 1995	Centre Directors, IOI
1.2	Write to various authorities inviting memoranda, views and whether submitter wants to be heard in person.	July, 1995	Centre Directors, IOI
1.3	Organise regional hearings	1 August, 1995 - 31 March, 1996	Concerned Vice-Chairman and Centre Director, IOI
1.4	Summarise memoranda etc. and emerging recommendations and submit to headquarters	31 July, 1995	Concerned VC and Centre Director, IOI
1.5	Prepare draft information report and circulate to all members of the Commission	15 August, 1995	Chairman and Secretary to the Commission
1.6	Consider information report	5 Sept. 1995 <hr/> 6-8 September 1995	Executive Committee <hr/> Commission
1.7	Finalise information report and submit to UNGA	15 October, 1995	Chairman and Secretary to the Commission

As would be seen from the above time table, the concerned Vice-Chairmen would supervise, guide and finalise the reports emanating from the Regional hearings. The allocation could perhaps be as under:

Vice President	IOI Centre
Prof. Guido de Marco	Malta
Prof. E.M. Borgese	Halifax
Amb. Layachi Yaker	Senegal, India
Mr. Yoshio Suzuki	India, Japan, South Pacific & China
VC from Latin America	Costa Rica

1996, 1997 and 1998.

In April 1996 the Commission would submit its recommendations regarding the oceans to the Commission on Sustainable Development (CSD) as the CSD would be considering the sustainable development of the oceans. There could be two plenary meetings of the Commission and four meetings of the Executive Committee in 1996. The detailed time table and work plan would be submitted in September, 1995. Monaco has agreed to host a Plenary in early 1996.

In 1997 the Commission would finalise its Report which would be released in 1998 (the Year of the Ocean). There could be two plenary meetings of the Commission and four meetings of the Executive Committee in 1997 and two meetings of the Executive Committee in 1998. Detailed workplans and time tables would be submitted in 1996 and 1997.

Preliminary considerations and arrangements for the preparation and a table of contents of the final report

The draft table of contents of the final report placed below for approval.

Draft table of contents

1. Introduction. Changing global system. Increase in number of actors -- States, NGOs, TNCs, media, citizens' groups and associations. Interdependence of issues, emergence of technological and institutional "gaps" due to High Technology, rise of environmental issues; issues of poverty, unemployment, gender, youth, indigenous people. The U.N. Special Conferences, in the wake of the Rio, 1992, Conference: their conclusions, recommendations, and consequences. Economic disequilibria and their impact on security. The changing concept of security, including economic and environmental security and its implications.
2. Sustainability -- the concept and its economic, political, cultural and social consequences. Sustainable development of marine resources -- fish, food, water, drugs, energy, minerals, shipping, space, recreation; their place in the global economy (seventy percent of international trade; fifty percent of tourism; coastal development). Increasing population pressure on coastal areas and its environmental impact. Islands development.
3. Legal issues, including
 - . interlinkages between Law of the Sea Convention, UNCED Conventions on Biodiversity and Climate Change, 1959 Antarctic Treaty, and Agenda 21;
 - . gaps in the form of national legislations and regional protocols.
4. Science and Technology. The science of planetary systems (GOOS, ecosystems, study of geosphere and biosphere) and High Technology. Cooperative and other mechanisms for involving the developing countries -- national, regional, global: New approaches to "technology transfer" in the age of high technology.
5. Institutional requirements at national, regional, and international levels. Redefining of the Regional Seas Programmes. Institutional mechanisms for the development of integrated policies, at national, regional, and international level.
6. Ocean governance and the restructuring of the international system, including the U.N. system and the place of the new actors therein.
7. Conclusions and action-oriented recommendations, including financial implications and ways of dealing with them.

Membership of the Independent World Commission
for the Oceans

In the informal consultations held in Paris from 10-11 April, 1995, the documentation circulated by the Executive Director of IOI (at Annexes I and II) was thoroughly and comprehensively studied and the following recommendations were made:

- . The proposed membership of the Commission, which should not exceed a total of 30, should be strengthened in the following areas:
 - . South Korea
 - . Indonesia
 - . Oceania
 - . Carribean/Latin America
 - . Gulf Cooperation Council.
- . The Executive Director of the IOI and the Treasurer appointed by the Commission should be ex officio members of the Commission.
- . A number of Eminent Persons could be added and invited to particular Sessions, or part thereof, in the context of their eminent competence on particular subjects.
- . A list of Honorary Members, including Heads of State, could also be added.

The list of Members needs to be finalised by the Committee.

To assist the Committee, brief descriptions of the suggested members is at Annex A.

**INDEPENDENT WORLD COMMISSION FOR THE SEAS
AND OCEANS**

Preliminary list of suggested names:

1. President Mario Soares, Chairman
2. Professor Guido de Marco, Vice Chairman, * Europe
3. Mr. Layachi Yaker, Vice Chairman, * Africa
4. Dr. Elisabeth Mann Borgese, Vice Chairman, * North America
5. Dr. Yoshio Suzuki, Japan *, Vice Chairman, Asia
Vice Chairman, Latin America
6. Alicia Barcena, * Mexico
7. Mohammed Bedjaoui, * Algeria
8. Cheng (AALCC)
9. Umberto Colombo, * Italy
10. Rene Dupuy, France *
11. Jens Evensen, Norway
12. Carl-August Fleischhauer, * Germany
13. Tommy Koh, * Singapore
14. Abdul Koroma, * Sierra Leone
15. Gunnar Kullenberg, Denmark
16. Former Prime Minister Lubbers, * Netherlands
17. Ronald St. John MacDonald, * Canada
18. Mircea Malitzaspain
19. Federico Mayor, *
20. Dr. Merkel, Minister for the Environment, Germany *
21. (Prince) Moulay Hicham ben Abdallah of Morocco
22. Robert Muller, * France
23. Osmal, Kader (Minister of Forests & Water, South Africa)
24. Arvid Pardo, * Malta
25. Christopher Pinto, * Sri Lanka
26. Mario Ruivo, * Portugal
27. Juan Somavia, * Chile
28. James Gustave Speth, * USA
29. Danielle de St. Jorre, * Seychelles
30. Su Jilan * (Academician, Academic Sinics, China)
31. Professor Swaminathan, * India
32. Ted Turner
33. Joseph Warioba, * Tanzania
34. Alexander Yankov, * Bulgaria
35. Malaysia
36. Brazil
37. one meteorologist

* have indicated that they would accept if invited.

	Social Sciences	Natural Sciences
Africa	Mohammed Bedjaoui* Prince Moulay Hicham ben Abdallah Osmal Kader Abdul Koroma* Danielle de St. Jorre* Joseph Warioba* Layashi Yaker*	
Asia	Tommy Koh* Yoshio Suzuki*	Su Jilan* S.M. Swaminathan*
E. Europe	Mircea Malitza Alexander Yankov*	
W. Europe	Umberto Colombo* Rene Jean Dupuy* Jens Evensen Carl-August Fleischhauer* Prime Minister Lubbers* Guido de Marco* Robert Muller* Arvid Pardo* Christopher Pinto* Mario Soares Heinz-Dieter Spranger	
L. America & Carribean	Alicia Barcena* Juan Somavia*	
N. America	E.M. Borgese* Ronald St. John Macdonald* James Gustave Speth* Ted Turner	

Supporting structures (Office of the President,
Secretariat) and arrangements for the
preparation of position papers to be commissioned etc.

All previous Commissions have had position papers either prepared by the staff/consultants attached to the Commission or from outside agencies/persons/working groups.

The Committee may like to decide on:

- (i) what position papers need to be prepared for the first Plenary;
- (ii) what position papers need to be prepared for inclusion in the report to the Commission on Sustainable Development in April 1996;
- (iii) which individuals/institutions etc. need to be contacted.

Thereafter the Secretary should be asked to prepare the necessary proposals for consideration of the Executive Committee on 3 September, 1995.

The Background Note prepared by IOI is at Annex B and a paper detailing the work done by IOI in relation to Ocean Governance, 1991-95, is at Annex C. Proposals from IOIs China, India and South Pacific are at Annexes D, E and F.

Proposed Budget for 1995-1998 for
and decision on servicing system
to be adopted

The Informal Consultation in Paris on 10 and 11 April, 1995 unanimously came to the following conclusions:

- travel should be by Executive/Club Class except for the Chairman who should travel First Class;
- Commissioners should be encouraged voluntarily to pay for their own travel expenses;
- regarding servicing of the activities of the Commission the following three alternatives should be considered:
 - . the IOI, with its regional centres, servicing the activities of the Commission including administration, maintenance of accounts, regional hearings, preparation of position papers, agenda etc.; the IOI could be strengthened by up to 5 high grade professionals/consultants as considered necessary;
 - . the IOI being responsible for administration, maintenance of accounts, regional hearings etc. with another secretariat being established for servicing the Commission;
 - . a totally separate secretariat being established with the IOI responsible for the regional hearings.

The Informal Consultation was of the view that each of the alternatives had its pros and cons and that the whole matter should be considered carefully.

Accordingly the Budget has been separately prepared for three alternatives and the position is as below:

	Cost
Alternative I (IOI)	\$3.92 million
Alternative II (IOI & separate secretariat)	\$5.43 million
Alternative III (separate secretariat)	\$6.55 million

The details are at pages 17 to 21 while an explanatory note on the proposed budget is at pages 22 to 32.

Funds Position.

The position regarding funds is briefly stated.

Government of the Netherlands

The Government of the Netherlands has responded favourably to a request for funds (letter from Mr. Pronk, Minister for Development Cooperation at Appendix VI). Though no amount

has been mentioned in the letter, it is understood that the amount may be US\$ 300,000 per year.

Sasakawa Peace Foundation, Japan

The Sasakawa Peace Foundation has agreed to meet all the costs of a plenary meeting to be held in Japan in September, 1995 and amounting to US\$ 300,000 as well as \$ 120,000 for regional hearings in Asia.

Government of Monaco

The Government of Monaco has agreed to fund a plenary meeting of the Commission to be held in early 1996 costing up to US\$ 300,000.

UNDP

A proposal has been sent to UNDP for a grant of US\$ 120,000 for the four IOI Centres in Fiji, Madras, Dakar and Costa Rica for funding regional hearings. The amount of US\$ 120,000 is likely to be approved.

CIDA

CIDA has responded favourably to a request for \$ 30,000 for conducting hearings in Canada.

Approval of Committee.

The Preparatory Committee may kindly decide:

- (i) how many of the proposed activities are to be approved.
- (ii) the alternative secretariat system according to which the budget is to be prepared.
- (iii) the strategy to be followed in raising the required funds, including funding and donor agencies to be targeted.

Details of Budget for the Commission
1995-1998

The Budget, it may be noted, is in modular form and can be adjusted by taking out any activity (plenary meetings of Commission, meetings of Executive Committee, regional hearings etc.). The note as presented would thus enable the Committee to finalise the activities based on estimates of how much money can be raised.

The Informal Consultation held in Paris on 10 and 11 April, 1995 suggested that three alternative budgets be prepared based on:

- the IOI secretariat servicing the Commission with the addition of a core group of 5 high grade professionals to prepare the papers and the report. The IOI Operational Centres would conduct the hearings in 1995 and conclude this work in early 1996. (Alternative I).
- the establishment of a separate secretariat for servicing the Commission and in charge of writing papers and the Report while the IOI would be responsible for the regional hearings, the maintenance of accounts and other administrative matters. (Alternative II).
- the establishment of a totally separate secretariat for the Commission. (Alternative III).

The budget could be thus divided into two parts: the fixed and the variable.

The picture of the **fixed budget** for Meetings and Regional Hearings year-wise is as below:

Item	1995 (8 months)	1996	1997	1998	Total
1.1 Preparatory work	50.0				50.0
1.2 Plenary meetings	175.0	350.0	350.0	-	875.0
1.3 Executive Committee meetings	66.0	116.0	116.0	100.0	398.0

Item	1995 (8 months)	1996	1997	1998	Total
1.4 Regional hearings					
* Meetings	180.0	60.0	-	-	240.0
* Coordination by HQ					
. travel & DSA	24.0	12.0	-	-	36.0
. staff / consult- ants	70.0	50.0	-	-	120.0
. communic- ations	50.0	35.0	-	-	85.0
* Administrat- ion-regional					
. travel & DSA	36.0	12.0	-	-	48.0
. staff / consult- ants	75.0	25.0	-	-	100.0
. communic- ations etc.	80.0	20.0	-	-	100.0
1.5 Expenses of Chairman & Vice Chairman					
* Travel & DSA	112.0	56.0	56.0	24.0	248.0
* administrat- ive assist- ance	50.0	70.0	70.0	20.0	210.0
Total	968.0	806.0	592.0	144.0	2510.0

The **variable budget** as for accounting, administration and report preparation for the three alternatives is as below:

Accounting, administration, report preparation
Alternative I

In the first alternative, i.e., the IOI Secretariat servicing the Commission, there is marginal addition to the administrative staff of IOI and the addition of 5 high grade professionals in the middle of 1996 to the middle of 1997 for preparing papers for the Commission and finalising the Report. Since IOI has an agreement with the Government of Malta exempting its employees from tax, the cost of five professionals including secretarial assistance is estimated at US\$ 400,000 per year.

All figures in \$'000

Activity	1995	1996	1997	1998
Administration				
2.1 Staff/Consultants	50.0	50.0	50.0	50.0
2.2 Travel & DSA	10.0	10.0	10.0	10.0
2.3 Communications etc.	30.0	30.0	30.0	30.0
Reports				
3.1 Staff/Consultants	-	200.0	200.0	-
3.2 Travel & DSA	-	30.0	30.0	-
3.3 Publishing	10.0	20.0	200.0	-
Admin. Subtotal	100.0	340.0	520.0	90.0
Meetings Subtotal	968.0	806.0	592.0	144.0
Total	1068.0	1146.0	1112.0	234.0

Budget 1995-1998	US\$ 3,560,000
Contingencies @ 10%	US\$ 356,000

Total	US\$ 3,916,000

Accounting, administration, report preparation-HQ
Alternative II

In the case of the second alternative, i.e., the establishment of a separate secretariat for servicing the Commission with IOI responsible for administration and accounts, the amount under the head 3.1 Staff/Consultants is estimated at US\$ 700,000 per year (\$ 500,000 for salaries, \$ 100,000 office expenses, \$ 100,000 for supporting staff). It may be noted that the salaries being taxable would be dependent on the taxation structure and living expenses of where the high grade professionals are located. US\$ 100,000 per person is a very conservative figure. The professionals are expected to be in position from 1 July, 1995 - 31 December, 1997.

All figures in \$'000

Activity	1995	1996	1997	1998
Administration				
2.1 Staff/Consultants	50.0	50.0	50.0	50.0
2.2 Travel & DSA	10.0	10.0	10.0	10.0
2.3 Communications etc.	30.0	30.0	30.0	30.0
Reports				
3.1 Staff/Consultants	350.0	700.0	700.0	-
3.2 Travel & DSA	30.0	30.0	30.0	-
3.3 Publishing	10.0	20.0	200.0	-
Admin. Subtotal	480.0	840.0	1020.0	90.0
Meetings Subtotal	968.0	806.0	592.0	144.0
Total	1448.0	1646.0	1612.0	234.0

Budget 1995-1998	US\$ 4,940,000
Contingencies @ 10%	US\$ 494,000

Total	US\$ 5,434,000

Accounting, administration, report preparation-HQ
Alternative III

In the third alternative, 2 professionals - one for accountancy and the other for administration are included under the head 2.1 Staff/Consultants. The cost is on the basis of \$ 200,000 for salaries, \$ 50,000 for supporting staff and \$ 50,000 for office expenses. The staff would have to be there till the end of the Commission's work i.e. from 1 June, 1995 till 31 December, 1998. Other things remain the same as for Alternative II.

All figures in \$'000

Activity	1995	1996	1997	1998
Administration				
2.1 Staff/Consultants	150.0	300.0	300.0	300.0
2.2 Travel & DSA	10.0	10.0	10.0	10.0
2.3 Communications etc.	30.0	30.0	30.0	30.0
Reports				
3.1 Staff/Consultants	350.0	700.0	700.0	150.0
3.2 Travel & DSA	30.0	30.0	30.0	10.0
3.3 Publishing	10.0	20.0	200.0	-
Admin. Subtotal	580.0	1090.0	1270.0	500.0
Meetings Subtotal	968.0	806.0	592.0	144.0
Total	1448.0	1896.0	1862.0	644.0

Budget 1995-1998	US\$ 5,950,000
Contingencies @ 10%	US\$ 595,000

Total	US\$ 6,545,000

Expenditure Position.

The total costs both fixed and variable, under the three alternatives is thus as under:

Alternative I	US\$ 3.92 million
Alternative II	US\$ 5.43 million
Alternative III	US\$ 6.55 million

Note on the Proposed Budget for the Commission
1995-1998

The proposed budget for the Commission is based on activities delineated in the Action Plan.

As is clear from the proposed activities, the World Commission on the Oceans would be acting in both a centralised and decentralised manner. On the one hand all decisions vest in the Commission and the Executive Committee while on the other hand it would be, through its Vice Presidents, organising regional hearings and so acting in a fairly decentralised manner.

Its activities would be as under:

Centralised:

- . Preparatory work
- . 5 Plenary meetings of the Commission (1 in 1995, and 2 each in 1996 and 1997)
- . 12 Executive Committee Meetings (2 each in 1995 and 1998, and 4 each in 1996 and 1997)
- . Preparation of:
 - * information report to UNGA (1995)
 - * recommendations to Commission on Sustainable Development (1996)
 - * final report (1997)

Decentralised:

- . holding of regional hearings
- . preparation of documents region-wise for:
 - * information report to UNGA
 - * recommendation to CSD
 - * final report

The schedule of activities is at Appendix I (page 26).

Fixed Budget - estimates of expenditure

1.2 Plenary

Each plenary (of 3 working days) is expected to cost \$ 175,000 as under:

Air fares for 30 Commissioners	\$ 90,000
DSA for 30 Commissioners (4 days)	\$ 30,000
Air fares for staff (5)	\$ 10,000
DSA for staff (5)	\$ 5,000
Meeting Expenses	\$ 10,000
Communications, telephone, fax etc.	\$ 20,000
Miscellaneous	\$ 10,000

Total	\$ 175,000

1.3 Executive Committee

Each inter-sessional executive committee meeting (3 days) is expected to cost \$ 50,000 as under:

Air fares for 7 persons	\$ 21,000
DSA for 4 days	\$ 7,000
Air fares for staff (2)	\$ 4,000
DSA for staff (2)	\$ 2,000
Meeting expenses	\$ 5,000
Communications etc.	\$ 5,000
Miscellaneous	\$ 6,000

Total	\$ 50,000

The executive committee meeting held along with the plenary would cost \$ 8000 for DSA, meeting expenses etc.

1.4 Regional Hearings

Meetings

Each meeting is expected to cost \$ 30,000.

Travel & DSA

The Executive Director and headquarters staff of IOI and the Regional Directors of IOI would also have to undertake journeys. The cost for 1995 is estimated at \$ 60,000 and for 1996 at \$ 24,000.

	1995 \$	1996 \$
Headquarters staff (8 journeys - 1995, 4 journeys - 1996)	24,000	12,000
Regional directors (8), 2 journeys each	36,000	12,000
	-----	-----
Total	60,000	24,000

Staff expenses

The staff both at headquarters and the regions would need to be augmented. A rough estimate for augmenting the administrative structure would be \$ 145,000 for 1995 and \$ 75,000 for 1996.

	1995 \$	1996 \$
Headquarters	70,000	50,000
Regions (8)	75,000	25,000
	<u> </u>	<u> </u>
Total	145,000	75,000

Communications etc.

Other administrative expenses are estimated at \$ 130,000 for 1995 and \$ 55,000 for 1996.

	1995 \$	1996 \$
Communications etc.		
* Headquarters	50,000	35,000
* 8 centres	80,000	20,000
	<u> </u>	<u> </u>
Total	130,000	55,000

1.5 Chairman and Vice Chairmen

The Chairman and the Vice-Chairmen would have to have funds to cover their travel to the various regional hearings. They would also need secretarial assistance. The costs would be as below:

(in \$'000)

	1995	1996	1997	1998
28 air journeys in 1995, 14 in 1996 and 1997 and 6 in 1998 @ \$ 4,000 per journey	112	56	56	24
Secretarial assistance to Chairman / Vice Chairmen	50	70	70	20
	<u> </u>	<u> </u>	<u> </u>	<u> </u>
	162	126	126	44

The detailed fixed budget based on the above details may be seen at Appendix II (page 27).

The total meetings expenditure (which is the same for all alternatives) is as below:

\$ '000

	1995	1996	1997	1998	Total
Subtotal for meetings	968	806	592	144	2510

Variable Budget - estimates of expenditure

The budget varies according to the alternative selected.

Administration**2.1 Staff / Consultants**

When alternative I is selected, the total cost of staff/consultants is taken as the marginal cost of augmenting the staff of IOI which is estimated at \$ 50,000 per annum (p.a.).

The above figures remain unchanged in the case of alternative II because it is still IOI which looks after accountancy, administration etc.

In alternative III, the cost of 2 Professionals (one for administration and the other for accountancy) is taken as \$ 200,000 p.a. with \$ 50,000 for the supporting staff \$ 50,000 for office expenses (rent for office space, furniture, fax etc.) or a total of \$ 300,00 p.a.

2.2 Travel & DSA

This is estimated at \$ 10,000 p.a. in all cases.

2.3 Communications, stationery etc.

This is estimated at \$ 30,000 p.a. in all cases.

Reports**3.1 Staff/consultants**

In the case of alternative I this is estimated at \$ 400,000 per year. The amount is low because of the salaries being tax free and Malta being 30-40 per cent cheaper than Europe.

In the case of alternative II and III the expenses are estimated at \$ 700,000 p.a. as given below.

Salary of 5 top grade professionals	\$ 500,000
Supporting staff	\$ 100,000
Office expenses (rent etc.)	\$ 100,000

Total	\$ 700,000

3.2 Travel and DSA

This is estimated at \$ 30,000 p.a. in all cases.

3.3 Publishing

1000 copies interim report to UNGA (50 pages)	\$ 10,000
1000 copies recommendation to CSD (100 pages)	\$ 20,000
5000 copies final Report - 3 volumes in book form (1000 pages)	\$ 200,000

Total Budget

The total costs for the three alternatives (details at Appendices III to V) are as below:

Alternative I	US\$ 3,916,000
Alternative II	US\$ 5,434,000
Alternative III	US\$ 6,545,000.

Activity	Yr	1995				1996				1997				1998				
		Qtr	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<u>Central-ised</u>																		
1.1 Preparatory work		x																
1.2 Plenary Meetings				x		x		x		x		x						
1.3 Execut- ive Com- mittee			x	x		x	x	x	x	x	x	x	x		x		x	
1.4 Prep- aration of reports etc.					x				x				x					
<u>Regional</u>																		
2.1 Hearings			x	x	x													
2.2 Prepara- tion of docum- ents			x				x				x							

Meetings & Regional Hearings

All figures in \$'000

Activity	1995	1996	1997	1998	Total
1.1 Preparatory	50.0	-	-	-	50.0
1.2 Plenary					
* Travel & DSA	135.0	270.0	270.0	-	675.0
* Administration	40.0	80.0	80.0	-	200.0
1.3 Executive Committee					
* Travel & DSA	40.0	74.0	74.0	68.0	256.0
* Administration	26.0	42.0	42.0	32.0	142.0
1.4 Regional hearings					
* Meetings	180.0	60.0	-	-	240.0
* Coordination-HQ					
. Travel & DSA	24.0	12.0	-	-	36.0
. staff / consultants	70.0	50.0	-	-	120.0
. communications etc.	50.0	35.0	-	-	85.0
* Administration - Regional					
. travel & DSA	36.0	12.0	-	-	48.0
. staff / consultants	75.0	25.0			100.0
. communications etc.	80.0	20.0			100.0
1.5 Expenses of Chairman / Vice Chairmen					
* travel & DSA	112.0	56.0	56.0	24.0	248.0
* admin. assistance	50.0	70.0	70.0	20.0	210.0
Meetings Subtotal	968.0	806.0	592.0	144.0	2510.0

Accounting, administration, report preparation
Alternative I

All figures in \$'000

Activity	1995	1996	1997	1998
Administration				
2.1 Staff/Consultants	50.0	50.0	50.0	50.0
2.2 Travel & DSA	10.0	10.0	10.0	10.0
2.3 Communications etc.	30.0	30.0	30.0	30.0
Reports				
3.1 Staff/Consultants	-	200.0	200.0	-
3.2 Travel & DSA	-	30.0	30.0	-
3.3 Publishing	10.0	20.0	200.0	-
Admin. Subtotal	100.0	340.0	520.0	90.0
Meetings Subtotal	968.0	806.0	592.0	144.0
Total	1068.0	1146.0	1112.0	234.0

Budget 1995-1998	US\$ 3,560,000
Contingencies @ 10%	US\$ 356,000

Total	US\$ 3,916,000

Accounting, administration, report preparation-HQ
Alternative II

All figures in \$'000

Activity	1995	1996	1997	1998
Administration				
2.1 Staff/Consultants	50.0	50.0	50.0	50.0
2.2 Travel & DSA	10.0	10.0	10.0	10.0
2.3 Communications etc.	30.0	30.0	30.0	30.0
Reports				
3.1 Staff/Consultants	350.0	700.0	700.0	-
3.2 Travel & DSA	30.0	30.0	30.0	-
3.3 Publishing	10.0	20.0	200.0	-
Admin. Subtotal	480.0	840.0	1020.0	90.0
Meetings Subtotal	968.0	806.0	592.0	144.0
Total	1448.0	1646.0	1612.0	234.0

Budget 1995-1998	US\$ 4,940,000
Contingencies @ 10%	US\$ 494,000

Total	US\$ 5,434,000

Accounting, administration, report preparation-HQ
Alternative III

All figures in \$'000

Activity	1995	1996	1997	1998
Administration				
2.1 Staff/Consultants	150.0	300.0	300.0	300.0
2.2 Travel & DSA	10.0	10.0	10.0	10.0
2.3 Communications etc.	30.0	30.0	30.0	30.0
Reports				
3.1 Staff/Consultants	350.0	700.0	700.0	150.0
3.2 Travel & DSA	30.0	30.0	30.0	10.0
3.3 Publishing	10.0	20.0	200.0	-
Admin. Subtotal	580.0	1090.0	1270.0	500.0
Meetings Subtotal	968.0	806.0	592.0	144.0
Total	1548.0	1896.0	1862.0	644.0

Budget 1995-1998	US\$ 5,950,000
Contingencies @ 10%	US\$ 595,000

Total	US\$ 6,545,000

Ministry of Foreign Affairs

The Hague

To:

Ms. E. Mann Borgese
International Ocean Institute
Dalhousie University
1226 Le Marchant Street
Halifax, Nova Scotia
CANADA B3H 3P7

Date:

23 januari 1995

Reference:

DIO/JS-2474

Subject:

Subsidy request World Commission
for the Oceans

Department:

DIO/JS

Thank you for your letters of 25 September and 8 November 1994. I support the establishment of a Commission with sufficient authority worldwide to draw attention to the importance of sustainable ocean development and the law of the sea.

As I indicated earlier I intend to respond positively to your request for a financial contribution. I hope to be able to indicate an exact amount in the near future. The level of the Netherlands contribution, among other things, depends on the confirmed commitments of other contributors. I would also like to suggest that efforts are made to acquire commitments of a wide range of countries which are representative of the various regions of the world. This would certainly enhance the commission's stature and authority.

I look forward to receiving this information. After receiving such information, and after the establishment of the Trust Fund by the Commission, I will inform you about the Netherlands contribution.

THE MINISTER FOR DEVELOPMENT COOPERATION,

J. P. Pronk

Proposed agenda for the first meeting
of the Executive Committee of the Commission

The proposed agenda for the first meeting of the Executive Committee of the Commission is as follows:

- Item 1: Adoption of the Agenda
- Item 2: Consideration and approval of procedures to be followed by the Commission
- Item 3: Approval of Work Plan for 1995 and 1996 and likely actions for 1997 and 1998
- Item 4: Approval of table of contents of final report
- Item 5: Approval of Budget of the Commission 1995-1998
- Item 6: Consideration of the report of the Secretary regarding progress made in regional hearings, fund raising etc.
- Item 7: Consideration of staff/consultants to be recruited, position papers to be commissioned etc.
- Item 8: Approval of Agenda for the first Plenary of the Commission
- Item 9: Approval of draft Information Report to the Fiftieth Session of UN General Assembly and to be placed before the first Plenary of the Commission
- Item 10: Any other matters with the approval of the Chair.

The Committee may approve the proposed agenda with such modifications as are considered necessary.

Proposed agenda for the first Plenary
Session of the Commission

The proposed agenda for the first Plenary of the Commission is as follows:

- Item 1: Adoption of the Agenda
- Item 2: Approval of terms of reference of the Commission
- Item 3: Approval of Workplan for 1995 and 1996 and likely actions in 1997 and 1998
- Item 4: Approval of Budget for 1995-1998
- Item 5: Report to the Plenary of the actions taken so far
- Item 6: Approval of table of contents of final report of the Commission
- Item 7: Approval of the information report to be submitted to the Fiftieth Session of the UN General Assembly
- Item 8: Any other item with the approval of the Chairman.

The Committee may approve the proposed agenda with such modifications as are considered necessary.

A N N E X A

INDEPENDENT WORLD COMMISSION FOR THE OCEANS

PRELIMINARY LIST OF SUGGESTED MEMBERS

Mario Soares, Chairman

Dr. Soares is President of the Republic of Portugal.

Layashi Yaker, Vice Chairman, Africa.*

Mr. Yaker has been Minister of Foreign Commerce in the Government of Algeria. He has been Algerian Ambassador to Washington and Moscow, Undersecretary General of the United Nations and Executive Secretary of the United Nations Economic Commission for Africa. He is President of the Governing Board of the International Ocean Institute and a member of the Club of Rome.

Yoshio Suzuki, Vice Chairman, Asia*

Dr. Suzuki is an economist. He has been associated with the Central Bank of Japan for over 30 years. He is now Chief Counsellor to the Nomura Research Institute.

Guido de Marco, Vice Chairman, Europe*

Professor Guido de Marco is Deputy Prime Minister and Minister of Foreign Affairs of Malta.

Juan Somavia, Chile, Vice Chairman, Latin America and the Caribbean

Dr. Somavia has been one of the Group of Eminent Persons advising on Multinational Corporations. He was a member of the Tinbergen Committee on Reshaping the International Order. He is now Chile's Permanent Representative to the United Nations in New York. He was Chairman of the Preparatory Committee for the Social Summit.

Elisabeth Mann Borgese, Vice Chairman, North America*

Dr. Borgese is Professor of Political Science at Dalhousie University. She is the founder and Hon. Chairman of the International Ocean Institute. She has been Adviser to the Delegation of Austria throughout UNCLOS III. She is the author of numerous books and essays on the Law of the Sea and ocean affairs

Alicia Barcena, Mexico*

Dr. Barcena was on the staff of the UNCED Secretariat in Geneva. She was responsible for Chapter 17 of Agenda 21. She is now Executive Director of the Earth Council in Costa Rica.

Mohammed Bedjaoui, Algeria*

Dr. Bedjaoui has been Permanent Representative of Algeria to the United Nations in New York. He has been one of the African leaders throughout UNCLOS III. He is the author of numerous books and essays on the New International Economic Order, on the Common Heritage of Mankind. He is President of the International Court of Justice.

Umberto Colombo, Italy*

Dr. Colombo has been Director-General of the Ente Nazionale Energia Alternativa (ENEA) in Italy. He has been Minister for Universities and Scientific Research. He is a member of the Club of Rome.

Hasjim Djalal, Indonesia

Dr. Djalal is a diplomat and expert in international law. He has been Indonesia's Ambassador to Canada and to Germany. He was one of the leaders of UNCLOS III and President of the first Session of the Assembly of the International Sea-bed Authority.

Ren Jean Dupuy, France*

Dr. Dupuy is Professor of International Law at the University of Nice and at the College du France in Paris. He is the author of numerous books on international relations, human rights, and the Law of the Sea.

Jens Evensen, Norway

Dr. Evensen has been Director General of the Legal Department of the Ministry of Foreign Affairs in Norway. He acted as Chair for the Norwegian Petroleum Council, the Fishery Limits Committee and many other committees. He was in charge of negotiating the Trade Agreement with the European Communities in 1972; Minister of Commerce, 1973-4, and head of the Norwegian Delegation to UNCLOS

III. He was one of the outstanding leaders of this Conference. From 1985 to 1994 he was a Judge at the ICJ.

*Carl-August Fleischhauer, * Germany*

Dr. Fleischhauer has been Legal Adviser to the Foreign Office of Germany and Legal Adviser and Under-secretary General of the United Nations. He is now a Judge at the International Court of Justice.

Moulay Hicham ben Abdallah, Morocco

Prince Hicham is an expert in international law and relations in which he holds a degree from Princeton University. His thesis supervisor was Professor Richard Falk.

*Koh, Tommy * Singapore*

Dr. Koh has been President of UNCLOS III, Ambassador to Washington and Chairman of the Prepcom for UNCED (Rio, 1992). He is now Professor at the Law School of the University of Singapore.

*Abdul Koroma, * Sierra Leone*

Ambassador Koroma has been one of Africa's leaders at UNCLOS III and the Preparatory Commission for the International Seabed Authority and for the International Tribunal for the Law of the Sea. He is now a Judge at the International Court of Justice.

Gunnar Kullenberg, Denmark

Dr. Kullenberg is an oceanographer. He is presently Secretary of the Intergovernmental Oceanographic Commission (IOC) of UNESCO

*Ruud Lubbers, * Netherlands*

Dr. Lubbers was Minister of Economic Affairs (1973-77) and Prime Minister of the Netherlands (1982-94). He is a leader of the Christian Democratic Party.

*Ronald St John Macdonald, * Canada*

Professor Macdonald has been Dean of the Law School of Dalhousie University, Professor of international Law at Toronto University, and Visiting Professor at Peking University. He is a Judge at the European Court for Human Rights in Strasbourg.

Mircea Malitza, Romania

Professor Malitza is an expert on education and a Member of the Club of Rome. He is the President of the Black Sea University.

Federico Mayor, Spain*

Dr. Mayor has been Professor Molecular Biology at the University of Barcelona and Minister of Education of Spain. He is Director-General of UNESCO.

Mochtar Kusuma-Atmadja, Indonesia

Dr. Mochtar is Professor of Law at Padjadjaran University Law School and University of Indonesia Law School in Djakarta, as well as Advisor to the Minister of Justice, Minister of Mines and Energy, and Minister for Foreign Affairs of Indonesia. He was a member of the Indonesian Delegation to UNCLOS III. He was Minister of Justice from 1974 to 1978. From 1978 to 1988 he was Minister of Foreign Affairs. In 1990 he was appointed to the Panel of Conciliators and Arbitrators of the ICSID, World Bank. He is the author of numerous books and articles.

Robert Muller, France*

Dr. Muller has been Undersecretary-General, U.N. He is now Chancellor of the University for Peace, Costa Rica. He is the author of numerous books on human affairs and education for peace.

Osmal, Kader, South Africa

Dr. Osmal is Minister of Forests & Water, of the Government of South Africa. He is a close associate of President Mandela.

Arvid Pardo, Malta*

Dr. Pardo has been Ambassador of Malta to U.N., USA, USSR, and High Commissioner to Canada; It was his address to the First Committee of the General Assembly (1967) that led to the establishment of UNCLOS III. He is widely known as "Father of the Law of the Sea"

Christopher Pinto, Sri Lanka*

Dr. Pinto has been one of Asia's leaders at UNCLOS III. He is now Secretary-General Iran-U.S. Claims Tribunal.

James Gustave Speth, USA*

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Professor Swaminathan is a biologist. He has been the Chairman of the International Commission for Peace and Food, and main author of its report *Uncommon Opportunities*.

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Professor Yankov was one of the leaders of UNCLOS III. He was the Chairman of the Third Committee, responsible for Parts XII, XIII, and XIV of the Convention, dealing with Marine Scientific Research, the Protection of the Marine Environment and the Development and Transfer of Technology. He is a Member of the International Law Commission, a member of the Council of IOC, and of the Governing Board of IOI, and Professor at the Law School of the University of Sophia.

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A N N E X B

BACKGROUND NOTE
ON THE
INDEPENDENT WORLD COMMISSION FOR
THE SEAS AND THE OCEANS

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**BACKGROUND NOTE ON THE WORLD COMMISSION
ON THE SEAS AND THE OCEANS**

The World Commission on the Seas and the Oceans has been established in the context of the basic importance of the world ocean in the development of human society, the maintenance of peace and the health of the biosphere.

The oceans cover three-fourths of the earth's surface. They are of crucial importance for the economy/ecology of the 21st Century. The new order for the seas and the oceans created by the United Nations Convention on the Law of the Sea, 1982, (LOS Convention) and which has come into force with effect from 16 November, 1994, creates a model for a new global order of the oceans which is capable of meeting the challenges of the next century. This model has been further expanded by the United Nations Conference on Environment and Development, 1992 (UNCED) to embrace the coastal zone as an important facet of the land-sea interface and as a matter of critical importance to the management of the global ecosystem and the oceans. The Secretary General's Agenda for Peace and his Agenda for Development underpins many of the issues generated by UNCED and the LOS Convention.

Law of the Sea Convention

The law of the sea has evolved since time immemorial in a pragmatic fashion, responding to the needs of particular historical eras for establishment of a legal order based on recognized and widely accepted rules - under the aegis of which the oceans could peacefully and profitably be used for the purposes of, and within the ambit of the techniques available to, the peoples of that era. Thus the law of the sea has, during its evolution, addressed among other things navigation, providing freedom of the sea, and fisheries, subsumed under the same doctrine. Later it began to establish the jurisdictional limits of the sea for peacetime and wartime purposes. As technology and the enhanced voyaging and exploiting power that went with it advanced, the law of the sea was used to establish ad hoc regulatory regimes - catching of some species of fish and cetaceans, for example, was regulated by quotas.

When the composition and ordering of international society began to change after World War II, with the advent of the United Nations and the impetus it provided for decolonization, and as both the world's population and its demands on the sea grew in tandem with unprecedented technological advances in navigating, exploiting, and surveying of the oceans and their resources, the new international community, especially its newly independent and still developing members, began to seek a new international economic order (NIEO) and looked to the oceans for partial realization of their goals. The Third United Nations Conference on the Law of the Sea (UNCLOS III), convened by the UN General Assembly from 1973 to 1982 to review all ocean issues, did not, however, fully realize the demands of developing states for a new international oceans order (NIOO). The very novelty of the provisions of the LOS Convention, for example, with respect to

deep seabed mining led to reservations on the part of the industrialised countries though the other provisions of the Convention have, by and large, tended to become customary state practice and law.

The LOS Convention has greatly expanded national jurisdiction through the concept of the 200 nautical miles exclusive economic zone (EEZ) where the coastal and hinterland states have rights and duties to explore and exploit the resources of the ocean. But although the LOS Convention confers rights and duties to coastal and hinterland states to explore and exploit the resources of the ocean, these rights do not, in actual fact, translate into tangible benefits for most of the developing states. The reasons for this are quite clear. In large measure the principal interest of the major powers in the oceans has been in security and other strategic matters. It is no surprise that some of the ocean areas, such as the Indian Ocean and its resources, have remained relatively unexplored and unmapped as compared to, for example, the Pacific and Atlantic oceans. For instance, the extent of the Indian Oceans' riches has for a long time been unknown. Even though steps toward comprehensive exploration and mapping of the ocean have been taken in recent years, most of the developing coastal states have almost entirely depended on external assistance because individual countries are hampered by lack of finances, technology, and a skilled labour force. This external assistance has more often than not been inadequate.

For many developing coastal states, expanded jurisdiction offers the promise of a greatly expanded resource base with regard to minerals, hydrocarbons, and living resources. However, many coastal states receive few benefits since rational management of ocean resources still remains largely unexplored and unexploited. Lack of resources in the form of capital, human resources, and technology has further complicated the situation.

The LOS Convention has established a new legal order for the oceans from which the development of all possible uses of ocean space and its resources will emanate. The LOS Convention recognizes the exclusive rights and jurisdiction of the coastal states over the resources adjacent to the coast and extending out to 200 nm (see Articles 56 and 57). Likewise, the Convention recognizes the right of the coastal states in the resources of their Continental Shelf, which may extend up to 350 miles or beyond under certain circumstances (see Articles 76 and 77). The immense resource potentials, both living and nonliving, if properly explored, exploited, and conserved, could certainly alleviate some of the economic problems affecting most developing countries and raise the living standards of their people. The Convention also gives developing countries a share of the profits emanating from the resources of the deep seabed in the area beyond national jurisdiction.

UNCED

UNCED ended in Rio de Janeiro, Brazil on 14 June 1992 with agreement on a wide range of environment and development issues.

Perhaps the most important outcome of this historic meeting was the new appreciation that environment and development are part of an indivisible whole and that they must be dealt with together. Consistent with the findings of the 1987 World Commission on Environment and Development (the Brundtland Commission and its report Our Common Future), the 172 nations gathered in Rio generally agreed that the greatest threats to a quality environment on a global basis are poverty, unrestrained population growth, and unsustainable patterns of consumption. **Sustainable development** has emerged as the key goal.

Oceans and coasts are but one chapter (Chapter 17) of the 40 chapters making up the 800 page 'Agenda 21' but many feel that it is one of the more substantive parts of Agenda 21.

Before discussing Chapter 17 of Agenda 21, it should be stressed that virtually none of the UNCED decisions are self-implementing and, except for the conventions on climate change and biological diversity, none are legally binding on nations. However, nations participating in the drafting of the Agenda 21 action programmes and formally approving their content (as all of them did), have associated themselves with the findings of the Agenda (as to the existence of certain problems and needs) and with the prescriptions for solutions laid out in the document. Hence, Agenda 21 represents a collective commitment of most of the world's nations to address a set of environment and development-related problems using a common orientation (the goal of sustainable development) to the best of their abilities and given their individual needs, constraints and limitations.

The UNCED text on the oceans gives support to four concepts:

- that the marine environment (ocean and adjacent coastal areas) 'forms an integral whole that is an essential component of the global life support system';
- that the oceans and adjacent coastal areas are 'a positive asset presenting opportunities for sustainable development';
- that the LOS Convention sets forth rights and obligations of states and 'provides the international basis upon which to pursue the protection and sustainable development of marine and coastal environment and its resources'; and
- that, given increasing problems of environmental loss and degradation, 'new approaches to marine and coastal area management and development are needed (at the national, subregional, regional, and global levels), approaches that **are integrated in content, and precautionary and anticipatory in ambit.**'

Integrated coastal management

In the Agenda 21 text dealing with oceans and coasts, coastal nations commit themselves to integrated management and sustainable development of coastal areas and marine environments under their national jurisdiction. The text calls for integrated policy and decision-making processes and provides a series of suggested actions that can assist coastal states in strengthening their efforts at integrated management of coastal and ocean areas.

Marine environmental protection

Agenda 21 calls for coastal nations to increase their efforts to deal with land-based sources of marine pollution. While this component accounts for up to eighty percent of the pollution currently found in the oceans, international efforts to deal with the problem have lagged. Among other things, the Agenda 21 programme calls upon nations to employ coastal planning and management efforts, including the control of non-point sources of pollution, as a step in strengthening existing activities.

Increasing efforts at the regional level are also called for to deal with the regulation of land-based sources of pollution.

Sustainable use and conservation of marine living resources

The improved conservation and management of high seas fisheries stocks was one of the ocean topics most vigorously debated at UNCED.

It seems likely that the new Sustainable Development Commission will address the conservation and management of fisheries stocks as an issue of high priority. Given the mandates contained in Agenda 21, first priority may be given to the high seas issues (including highly migratory species), but conservation and management practices within national jurisdictions will also be addressed.

The elements of the New Global Partnership

Seen in its largest perspective, the actions taken at the Rio UNCED meeting represent a coordinated effort at creation of a new global partnership on environment and development. Setting aside national security concerns, the new partnership aims to address what arguably are the most fundamental problems facing the world today—those of poverty, overpopulation, and unsustainable consumption.

The new partnership has two specific goals:

- . providing funding and technical assistance to the nations of the South so that they can develop in ways

that minimize the impact of that development on the earth's environment and global life support system.

- . motivating nations of the North to begin to move away from unsustainable patterns of consumption in order to create 'environmental space' for the development of the South.

The overall goal, of course, is to encourage nations individually and collectively towards 'sustainable development' and here a delicate balance is required. Poorer nations of the South do not want to see policies that favour future generations at the expense of the present generation many of whom continue to live in impoverished conditions.

The new partnership, the seeds for which were sown in Rio, can be thought of as composed of five components:

- . a set of principles (the Rio Declaration) that collectively describe the goals of the 'new order' that is sought;
- . a set of policies and action programmes (Agenda 21) that call for the kinds of changes in national and international behaviour that will be necessary if the world is to move toward a condition of sustainable development;
- . a series of financial arrangements (largely grants and loans from the North to the South) that will fund the additional costs that will be incurred in implementing Agenda 21;
- . agreements that acknowledge that the South will need 'access' to the environmentally sound technologies of the North;
- . the creation of a new institution to oversee the implementation of Agenda 21 (the Sustainable Development Commission).

Secretary-General's Agendas for Peace and Development

The implementation of the Secretary-General's Agendas for Peace and for Development as well as the implementation of the decisions of the Social Summit would enhance sustainable development and comprehensive security, including economic security (development) and environmental security (conservation). Ocean development and the Law of the Sea could make significant contributions to the implementation of all three agendas. Their implementation in the marine sector is in fact essential. Regional cooperation and organisation, with proper linkages both to the mechanisms of national and of global governance, and an interdisciplinary, transectoral approach to decision-making and problem-solving, are central to all three, as they are to Agenda

21 and the Convention on the Law of the Sea. Planning from bottom up, not from top down; participation of the nongovernmental sector, women, youth, indigenous people; the eradication of poverty are goals in decision-making that all these programmes have in common. Conceptualisation of, and in a number of cases already practical experience with, the necessary institutional arrangements is more advanced in the marine sector than elsewhere. With the necessary adaptations, they could find wider application.

World Commission on the Seas and Oceans

To carry further the process initiated by the LOS Convention and UNCED, a World Commission on the Seas and the Oceans (the Commission) has been set up under the leadership of President Soares of Portugal.

The Commission's terms of reference are:

- . to refocus world attention on the importance of sustainable ocean development and the law of the sea;
- . to monitor the ratification, implementation, and progressive development of the Convention, at national, regional, and global levels;
- . to examine whether States, especially developing countries, are able to fulfil their duties, enjoy their rights and generate their benefits under the Convention, to analyze the difficulties they might encounter, and to propose ways and means to overcome them;
- . to monitor the implementation of Chapter 17 of Agenda 21, at national, regional and global levels and to observe the function of the Convention in this process (legal framework; peaceful settlement of disputes; enforcement);
- . to follow the development of regional programmes of cooperation and development in the marine sector and examine how they adjust to the new requirements of integrated ocean management and sustainable development;
- . to examine the role of the Law of the Sea and ocean development in the process of restructuring the United Nations system as a whole for the 21st century and elaborate proposals to strengthen this role.

As is clear, the main objective of the Commission is to synthesise the LOS Convention and UNCED's Agenda 21, to fill in the gaps, if any, to suggest other necessary measures, and to indicate the institutional mechanisms at the international, regional and national levels that would help the attainment of what is set out in Agenda 21 and the LOS Convention.

The Issues Before the Commission

The coastal zone.

The oceans and seas cover 70 per cent of the Earth's surface and are active components of the global biosphere. One of the major developments of the last 20 years has been the realization that this vast sector of the environment is dynamic and interactive; thus, long-term environmental management of even a small portion of the marine environment requires an integrated approach which must include consideration of the coastal zones and also their drainage basins and the atmosphere.

The coastal zone, here defined as the region between the seaward margin of the continental shelf and the inland limit of the coastal plain, is among the regions of highest biological productivity on Earth. It is also the zone with the greatest human population. According to UNEP, about 60 per cent of humanity (or nearly three billion people) live in the coastal zone, and two-thirds of the world's cities with populations of 2.5 million or more are near estuaries. Within the next 20-30 years the population of this zone is expected to almost double. Some data on the coastal zone is presented in Table 1. As will be seen from there, the rise in urban population is much higher in the South (more than double that in the North).

This increase is inevitably altering land-use patterns in coastal zones. Other impacts there - and in the coastal regions generally - come from pollution, flooding, land subsidence and compaction, and the effects of upland water diversion. Natural habitats are being lost through reclamation for urban and industrial development, agriculture and mariculture. Nearshore regions are being degraded by eutrophication and industrial waste; public health is threatened by sewage contamination of beaches and seafood; and the marine environment is being fouled by the progressive build-up of chlorinated hydrocarbons, plastic litter and the accumulation of tar on coastlines. Some of the waste products of coastal development, augmented by discharges through coastal outfalls and rivers, spread outwards to the world oceans, carried by the atmosphere, currents and ships.

The proper management and sustainable development of the coastal zone is thus an issue of critical importance that is being addressed by the World Commission. Some of the questions that arise are:

- what are the scientific and technological parameters that need to be addressed in this connection
- whether integrated institutional mechanisms exist to ensure sustainable development of the marine environment
- what environmentally sound technologies are required

Marine Pollution.

The sea is the ultimate sink for most of the liquid wastes and a considerable fraction of the solid wastes resulting from human activities on land. According to UNEP, more than three-quarters of all marine pollution comes from land-based sources, via drainage and discharges into rivers, through outfalls flowing directly to estuaries, bays and open coast, and from the atmosphere. The rest comes from shipping, dumping and offshore mining and oil production. The greater part of this pollution passes into coastal waters, and more than 90 per cent of all chemicals, refuse and other materials entering these waters remains there in sediments, wetlands, fringing reefs and other coastal ecosystems.

Such excessive nutrient loads bring marked ecological changes. The structure of plankton communities is altered, with preferential growth of small flagellates rather than the larger diatoms, and unusual plankton 'blooms', uncontrolled by the normal processes of grazing. The subsequent decomposition of the mass of organic matter deoxygenates the water, killing fish and invertebrates, while some species of algae produce foam and scum which interfere with fishing and reduce the amenity of beaches when washed ashore. In some cases the sea is discoloured, giving rise to the term 'red tide'. Some of the plankton species are toxic, and consumers of seafood exposed to such blooms are at risk from paralytic, diarrhoeic and amnesic shellfish poisons.

Some 6.5 million tonnes of litter finds its way into the sea each year. In the past, much of it disintegrated quickly, but resistant synthetic substances have in recent years replaced many natural, more easily degradable materials. Plastics, for example, can persist for up to 50 years, and because they are usually buoyant, they are widely distributed by ocean currents and winds. Many beaches are littered with plastic waste of various kinds, from land and ships. Along the beaches of the Mediterranean, about 70 per cent of the debris examined in one investigation was plastic: in the Pacific the figure exceeded 80 per cent. A major source of plastic debris is the fishing industry: UNEP has estimated that more than 150,000 tonnes of plastic fishing gear is lost (or discarded) in the oceans each year. Such debris is a nuisance to the tourist industry and can be a serious hazard to marine animals such as seals. A particularly serious new problem is posed by modern plastic drift nets, which are many kilometres in length and which, if they break free from a vessel, continue to float around the oceans entrapping and killing all manner of species.

Tables 2 and 3 give an account of the extent of human disturbance and a list of the international and marine protected areas. Both are, as is to be expected, much higher in the North relative to the South.

Some of the questions that arise are:

- what steps can be taken by the North to eliminate

and/or reduce sources of pollution;

- what steps can be taken in the South to minimise marine pollution consistent with the objective of eliminating poverty and raising standards of living;
- how can environmentally safe technologies be made available to the South;
- what institutional mechanisms can be developed to ensure the development and acquisition of such technologies by the South.

Marine resources-living

The seas are the source of resources like fish, drugs, seaweeds etc. which are good sources of protein, provide livelihood to millions and could be used for the cure of many diseases.

Marine fisheries, unlike terrestrial species, are not subject to the exclusive sovereignty of one state-except when they are located in internal waters or territorial seas-and generally migrate through a variety of jurisdictional zones in which foreign-flag vessels have certain rights.

Treaties that apply to conservation of migratory species in general or to trade in endangered species comprehend only such marine species of fish and mammals as are listed in their appendices, but many other marine species are increasingly susceptible to the threat of over-exploitation. Their conservation has, however, mainly been related to controlling access to fisheries and limiting catch. The rise in catches has been phenomenal: in 1938 the world fish catch was 15 million tonnes (m.t); by 1958 it had risen to 28 m.t.; by 1978 to 64 m.t.; by 1990 to 76 m.t. It is expected that by the year 2000 it may reach 100 m.t., at which point it is likely to level off. The reasons for this increase include rising populations, mostly located on coasts, the increase in the number of independent states, many wishing to enter or expand the fishing industry, but, above all, the enormous advances made in technological means of spotting, fishing, and processing fish. From use of rod and line and small and simple sailing boats operating close-inshore using simple nets and taking fish mainly for human consumption locally, developed sections of the industry have progressed to the highly sophisticated factory ships. Details of marine catches are at Table 4.

There is also a question of marine biodiversity. Over 90 per cent of the world's living biomass is contained in the oceans, which cover 71 per cent of the Earth's surface. Despite the predominance of marine ecosystems, only a small percentage of the oceans has been sampled. New marine phenomena, communities, and species are constantly being identified. In 1977, hydrothermal vents, or undersea hot springs, were discovered on the ocean floor. They support diverse communities, not through the

photosynthetic activity of primary producers such as plants or algae but through the chemical breakdown of hydrogen sulfide and other compounds to create energy. Marine biodiversity is so poorly known that we continue to discover even large vertebrates. In 1938, the coelacanth fish, long thought extinct, was found living in the Indian Ocean. In recent years, specimens of the megamouth shark, a 5-meter-long filter feeder, were caught.

How diverse are marine ecosystems? Recent discoveries have upped estimates of total marine species from 160,000 in 1971 to at least 10 million species, possibly more today. Although the marine environment may not rival its terrestrial counterpart in total number of species, it is more diverse in measures of uniqueness-of a total of 33 animal phyla, 32 are found in the ocean and 15 are exclusively marine-and of function-that is, for the variety of lifestyles its species has evolved to survive. For example, marine organisms ranging from zooplankton to baleen whales have adapted filter-feeding strategies to capture their food, a rare or nonexistent phenomenon on land. Marine ecosystems also exhibit more complex food webs.

Marine biodiversity provides a wealth of services. Photosynthetic phytoplankton lock up atmospheric carbon, a primary contributor to global warming. Fish and shellfish provide a plentiful supply of protein to human populations worldwide. Seaweed derivatives are used in the production of food, cosmetics, shampoo, detergent, and industrial lubricants. And because many marine organisms rely on chemical defences, the oceans are a promising source of new medicine. The same chemicals that protect species against predators may serve humanity in combating hypertension, cardiovascular problems, and viral and bacterial infections. The oceans could thus in the future provide many drugs and chemicals in combating many of the prevalent diseases.

Another untapped source is mariculture. The total marine fish, crustaceans and molluscs produced through mariculture was hardly 6 million tons per annum in 1989-90. This could increase manifold especially if allied to biotechnology. This is a fertile area for the South provided the developing countries can set up an appropriate scientific and technological infrastructure.

The issues that arise are:

- how to have sustainable development of marine resources both in the capture and aquaculture sectors
- what institutional, legal, financial, manpower development and technological steps are necessary in this regard

Marine resources-non living

The oceans have vast resources in the state of energy, minerals

and transportation systems. The present position regarding offshore oil and gas is at Table 5 and of shipping and transportation at Table 6. Obviously the proven reserves of oil and gas in the South will rise as more exploration takes place. But even as it is these is considerable scope for the developing nations to add to their resource base and economic welfare. The lack is of capital, technology and trained manpower. The issues that would arise would be similar to those that arise in the case of living resources.

Sustainable ocean development and the law of the sea

The Convention has parts and Articles relating to the protection and preservation of the marine environment (Part XII), conservation of living resources in the exclusive economic zone (Article 61), conservation and management of the living resources of the high seas (Part VII Section 2) and the co-operation of States bordering enclosed or semi-enclosed seas to co-ordinate the management, conservation, exploration and exploitation of the living resources of the sea (Article 123(a)).

The above provisions require the coastal states to promulgate laws and regulations in pursuance of the aims specified in the Convention and to co-operate both among themselves and with competent international organisations towards the achievement of these ends.

The questions that arise are:

- whether the actions taken by States so far can be considered to be adequate? If not what are the reasons for not taking adequate action? And what needs to be done to promote the taking of such action.
- whether the cooperation by States in the spheres of enforcement, conservation, science and technology, including the setting up of international, regional and subregional institutions can be considered to be adequate? If not, what more needs to be done.
- whether the specialised agencies of the United Nations (FAO, IMO, UNESCO/IOC, UNIDO, WMO) have been cooperating with the States, especially developing States, to further the prospects of sustainable development? If not, what needs to be done.

Ratification, implementation, and progressive development of the Convention at national, regional and global levels

The Convention has become law with effect from 16 November, 1994 but many states have not yet ratified it and many who have ratified it, have not yet implemented it.

The Convention mandates cooperation between States at national, regional and global levels in various areas including, inter alia,

- . sea lanes, and traffic separation schemes in straits (Article 41 (5))
- . navigational and safety aids and the prevention, reduction and control of pollution in straits (Article 43)
- . conservation of living resources, including highly migratory species, marine mammals and anadromous stocks (Articles 61, 64, 65 and 66)
- . conservation of living resources of the high seas (Articles 117 - 119)
- . enclosed and semi-enclosed seas (Article 123)
- . access for land-locked states to the sea (Articles 129, 132)
- . orderly, safe and rational management of the resources of the international area (Articles 150, 151 and 160)
- . protection and preservation of the marine environment (Articles 197, 199 - 202)
- . marine scientific research for peaceful purposes (Articles 242 - 244)
- . development and transfer of marine technology (Articles 266, 268 - 273)
- . establishment of regional marine scientific and technological research centres, particularly in developing States (Article 268)

The issue that needs to be tackled is the extent to which States have been cooperating in the above fields? What can be done to further such co-operation including the establishment of marine scientific and technological research centres?

States, especially developing countries, and their ability to fulfil their duties and enjoy their rights and generate their benefits under the Convention; Agenda 21; regional programmes

The Convention has vastly expanded the jurisdiction of coastal States. This gives to the States the opportunity to enjoy their rights and generate benefits. But at the same time the Convention also casts duties on the States - provision of safety and navigational aids, the establishment of search and rescue systems, establishment of total allowable catch, transfer of environmentally safe technology to developing countries,

providing assistance in the fields of marine science and research etc. At the same time the enjoyment of rights and the generation of benefits requires inter alia, inputs in the form of adequate surveillance systems, scientific research, exploration, marine technology, finance, trained manpower and integrated management systems - matters in which the developing countries in particular are lacking. The issue is a broad one and it is necessary to:

- specify the actions and policies necessary to remedy these deficiencies?
- indicate what needs to be done in this regard - by international organisations, the industrialised states, developing countries and the international funding agencies at the national, regional and international levels?

Secretary General's Agenda for Peace and Development

Ocean issues are integrally linked up with the issues of Peace and Development. Planning from the bottom up, participation of NGOs, women, youth and indigenous people, the eradication of poverty - these are all common goals.

Questions that will arise are:

- whether proper linkages can be established between the mechanisms and programmes for sustainable ocean development and the implementation of the Secretary-General's Agendas for Peace and for Development, and of the decisions of the Social Summit.

It is clear that problems of global governance, first pioneered in the Law of the Sea with the incredibly complex "Constitution for the Oceans," have matured considerably during the last decades. Ocean development and the Law of the Sea must now be considered in this broader context, as possible model for, and part of a new social, economic, and political order for the 21st century under a restructured United Nations.

Role of the Law of the Sea and Ocean Development in the process of restructuring the United Nations

There is talk of restructuring the United Nations so as to enable it to meet the challenges of the 21st Century. The Oceans cover 71 per cent of the globe but there is no adequate coverage of matters relating to the Oceans by the UN System. The broad issue is as to how the UN should be restructured to adequately deal with oceanic matters both at the international and regional levels.

Coastal Areas

	Length of Coastline (million km)	Maritime Area		Population in Coastal Urban Agglomerations		% rise
		Shelf to 200 m depth	EEZ	1980	2000	
Africa	37.9	1.3	12.0	43.2	111.6	158%
Asia	163.6	6.8	20.3	281.8	487.1	73%
Oceania	52.5	2.5	14.2	13.4	18.1	35%
North & Central America	184.0	5.6	18.8	88.9	121.4	36%
South America	30.7	2.0	10.1	59.6	104.6	76%
Europe	69.6	2.0	14.7	111.8	130.0	16%
USSR (former)	47.9	1.2	4.5	18.4	24.0	30%
World	568.2	21.4	94.6	617.1	996.8	62%

Source: Table 22.6 World Resources, 1994-95, Oxford University Press, 1994

Coastal Areas

	Length of Coastline (kilometres)	Maritime Area (thousand sq. km)		Population in Coastal Urban Agglomerations (thousands)		% rise 1980-2000
		Shelf to 200m in depth	EEZ	1980	2000	
AFRICA	37,908	1,326	11,981	43,213	111,643	158%
Algeria	1,183	14	137	3,493	7,613	118%
Angola	1,600	67	606	1,132	3,603	218%
Benin	121	x	27	585	2,527	332%
Cameroon	402	11	15	854	2,802	228%
Cape Verde	965	x	789	125	360	188%
Comoros	340	x	249	89	240	170%
Congo	169	9	25	217	571	163%
Cote d'Ivoire	515	10	105	1,495	4,125	176%
Djibouti	314	x	6	211	455	116%
Egypt	2,450	37	174	4,246	8,020	89%
Equatorial Guinea	296	x	283	181	392	117%
Ethiopia	1,094	48	76	760	1,909	151%
Gabon	885	46	214	155	498	221%
Gambia, The	80	x	20	109	293	169%
Ghana	539	21	218	1,336	3,139	135%
Guinea	346	38	71	696	2,025	191%
Guinea-Bissau	274	x	150	174	353	103%
Kenya	536	14	118	489	2,020	313%
Liberia	579	20	230	465	1,195	157%
Libya	1,770	84	338	1,496	4,322	189%
Madagascar	4,828	180	1,292	570	2,032	156%
Mauritania	754	44	154	238	1,177	395%
Mauritius	177	92	1,183	410	565	38%
Morocco	1,835	62	278	5,543	11,472	107%
Mozambique	2,470	104	562	1,109	5,240	372%
Namibia	1,489	x	x	76	290	282%
Nigeria	853	46	211	4,383	14,135	222%
Reunion	201	x	x	279	479	72%
Senegal	531	32	206	1,378	3,077	123%
Seychelles	491	x	1,349	x	x	x
Sierra Leone	402	26	156	453	1,175	159%
Somalia	3,025	61	783	1,186	3,308	179%

South Africa	2,881	143	1,553	4,272	8,294	94%
Sudan	853	22	92	356	1,193	235%
Tanzania	1,424	41	223	1,750	6,945	297%
Togo	56	1	2	324	983	203%
Tunisia	1,143	51	86	2,476	4,540	83%
Zaire	37	1	1	102	276	71%
ASIA	163,61	6,769	20,258	281,83	487,1	73%
Bahrain	161	5	5	279	582	108%
Bangladesh	580	55	77	1,809	5,053	179%
Brunei	161	x	x	x	x	x
Cambodia	443	x	56	50	287	474%
China	14,500	870	1,356	38,936	66,510	71%
Cyprus	648	6	99	291	457	57%
Hong Kong	733	x	x	4,614	6,088	32%
India	12,700	452	2,015	37,317	78,255	110%
Indonesia	54,716	2,777	5,409	29,166	58,303	100%
Iran, Islamic Rep	3,180	107	156	872	1,480	70%
Iraq	58	1	1	0	0	x
Israel	273	4	23	2,826	4,110	45%
Japan	13,685	480	3,861	78,349	88,798	13%
Jordan	26	x	1	70	146	108%
Korea, Dem People's Rep	2,495	x	130	5,973	14,233	138%
Korea, Rep	2,413	245	x	16,911	29,292	73%
Kuwait	499	12	12	1,190	2,660	123%
Lebanon	225	4	23	2,016	3,135	56%
Macao	40	x	x	x	x	x
Malaysia	4,675	373	476	3,997	9,158	129%
Maldives	644	x	959	x	x	x
Myanmar	3,060	229	509	3,923	7,695	96%
Oman	2,092	61	562	62	302	338%
Pakistan	1,046	58	318	5,215	12,350	137%
Philippines	22,540	178	1,786	17,736	37,181	110%
Qatar	563	24	24	197	455	131%
Saudi Arabia	2,510	78	186	1,954	4,201	115%
Singapore	193	0	0	2,414	2,950	22%
Sri Lanka	1,340	27	517	2,433	3,496	44%
Syrian Arab Rep	193	x	10	266	853	21%
Thailand	3,219	258	86	5,698	13,541	138%
Turkey	7,200	50	237	9,928	17,028	72%

United Arab Emirates	1,448	59	59	824	1,517	84%
Viet Nam	3,444	328	722	5,585	14,317	156%
Yemen	1,906	25	584	927	2,660	187%
<u>OCEANIA</u>	52,488	2,514	14,171	13,41	18,117	35%
Australia	25,760	2,269	4,496	10,568	13,902	32%
Fiji	1,129	2	1,135	244	423	73%
New Zealand	15,134	243	4,833	2,279	2,832	24%
Papua New Guinea	5,152	x	2,367	322	960	98%
Solomon Islands	5,313	x	1,340	x	x	x
<u>NORTH & CENTRAL AMERICA</u>	184,950	5,632	18,759	88,896	121,410	36%
Antigua and Barbuda	153	x	x	x	x	x
Bahamas	3,542	86	759	x	x	x
Barbados	97	x	167	100	146	46%
Belize	386	x	x	x	x	x
Bermuda	103	x	x	x	x	x
Canada	90,908	2,903	2,939	3,066	3,852	26%
Cayman Islands	160	x	x	x	x	x
Costa Rica	1,290	16	259	1,050	2,258	115%
Cuba	3,735	x	363	6,628	8,942	35%
Dominica	148	x	20	x	x	x
Dominican Rep	1,288	18	269	2,787	5,797	108%
El Salvador	307	18	92	1,680	3,049	81%
Greenland	44,087	x	x	x	x	x
Grenada	121	x	27	x	x	x
Guadeloupe	306	x	x	142	196	38%
Guatemala	400	12	99	780	932	19%
Haiti	1,771	11	160	1,216	2,845	134%
Honduras	820	53	201	583	1,923	230%
Jamaica	1,022	40	298	1,016	1,689	66%
Martinique	290	2	x	217	279	29%
Mexico	9,330	442	2,851	6,529	9,501	46%
Nicaragua	910	73	160	1,166	2,837	143%
Panama	2,490	57	306	989	1,749	77%
Trinidad & Tobago	362	29	77	623	1,110	78%
United States	19,924	1,871	9,711	60,324	74,305	23%
<u>SOUTH AMERICA</u>	30,663	1,985	10,125	59,553	104,628	76%
Argentina	4,989	796	1,164	12,273	16,643	36%
Brazil	7,491	769	3,168	25,616	49,160	92%
Chile	6,435	27	2,288	3,212	4,856	51%

Colombia	2,414	68	603	2,926	3,926	34%
Ecuador	2,237	47	1,159	1,529	3,877	154%
French Guiana	378	x	x	x	x	x
Guyana	459	50	130	213	425	100%
Peru	2,414	83	1,027	6,975	14,339	106%
Suriname	386	x	101	140	216	54%
Uruguay	660	57	119	1,511	1,862	23%
Venezuela	2,800	88	364	5,158	9,324	81%
EUROPE	69,643	1,951	14,7	111,806	129,989	16%
Albania	418	5	12	622	1,140	83%
Belgium	64	3	3	1,968	2,097	7%
Bulgaria	354	12	33	857	1,182	38%
Denmark	3,379	69	1,464	3,980	4,201	6%
Finland	1,126	98	98	1,539	1,998	30%
France	3,427	148	3,493	9,380	10,692	14%
Germany	2,389	41	50	3,944	4,301	9%
Greece	13,676	25	505	5,252	6,559	25%
Iceland	4,988	134	867	186	231	24%
Ireland	1,448	126	380	1,766	2,469	40%
Italy	4,996	144	552	21,232	23,721	12%
Malta	140	13	66	303	327	8%
Netherlands	451	85	85	7,764	9,032	16%
Norway	5,832	103	2,025	2,324	3,033	31%
Poland	491	28	28	1,842	2,853	55%
Portugal	1,693	39	1,774	2,352	3,499	49%
Romania	225	24	32	573	866	51%
Spain	4,964	170	1,219	13,903	17,925	29%
Sweden	3,218	155	155	4,018	4,306	7%
United Kingdom	12,429	492	1,785	26,765	27,790	4%
Yugoslavia (former)	3,935	37	52	1,236	1,767	43%
U.S.S.R. (former)	47,892	1,249	4,490	18,372	23,975	30%
Azerbaijan	x	x	x	x	x	x
Estonia	1,393	x	x	x	x	x
Georgia	310	x	x	x	x	x
Kazakhstan	2,909	x	x	x	x	x
Latvia	531	x	x	x	x	x
Lithuania	108	x	x	x	x	x
Russian Federation	37,653	x	x	x	x	x
Turkmenistan	1,786	x	x	x	x	x
Ukraine	2,782	x	x	x	x	x

Uzbekistan	420	x	x	x	x	x
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Source: World Resources 1994-95, Table 22.6, Oxford University Press, New York.

Levels of Human Disturbance, 1993

Percentage of Total Land Area Classified as Regions of:

	Low Human Disturbance	Medium Human Disturbance	High Human Disturbance
Africa	49	35	16
Asia	30	38	32
North & Central America	56	21	23
South America	59	25	16
Europe	15	18	67
USSR (former)	57	16	28
Oceania	61	27	12
World	48	28	24

Source: Table 20.2, World Resources 1994-95, Oxford University Press, 1994

Levels of Human Disturbance, 1993

	Low Human Disturbance	Medium Human Disturbance	High Human Disturbance
<u>AFRICA</u>	49	35	16
Algeria	83	10	7
Angola	53	29	18
Benin	13	64	24
Botswana	57	42	1
Burkina Faso	12	67	21
Burundi	0	3	97
Cameroon	15	51	33
Central African Rep	46	44	10
Chad	54	40	6
Congo	57	36	8
Cote d'Ivoire	23	38	39
Djibouti	0	100	0
Egypt	79	15	6
Equatorial Guinea	84	0	16
Ethiopia	2	93	5
Gabon	81	2	5
Gambia, The	x	x	x
Ghana	2	56	42
Guinea	34	41	24
Guinea-Bissau	0	36	64
Kenya	43	45	12
Lesotho	0	81	19
Liberia	27	17	57
Libya	90	9	1
Madagascar	15	4	81
Malawi	4	37	59
Mali	67	31	3
Mauritania	92	8	0
Mauritius	x	x	x
Morocco	1	9	90
Mozambique	35	43	22
Namibia	76	21	4
Niger	75	24	1
Nigeria	3	54	43
Rwanda	0	34	66

Senegal	1	48	52
Sierra Leone	0	31	69
Somalia	32	65	3
South Africa	27	33	40
Sudan	32	59	9
Swaziland	0	50	50
Tanzania	41	43	16
Togo	0	58	42
Tunisia	18	56	26
Uganda	45	15	40
Zaire	45	40	15
Zambia	82	9	9
Zimbabwe	18	55	27
<u>ASIA</u>	30	38	32
Afghanistan	17	75	8
Bangladesh	0	19	81
Bhutan	29	58	13
Cambodia	22	21	57
China	32	35	33
India	2	42	55
Indonesia	52	10	38
Iran, Islamic Rep	6	83	11
Iraq	25	57	17
Israel	0	64	36
Japan	0	40	61
Jordan	47	41	12
Korea, Dem People's Rep	0	35	65
Korea Rep	0	18	82
Kuwait	33	54	13
Lao People's Dem Rep	28	6	66
Lebanon	0	13	87
Malaysia	41	19	40
Mongolia	60	35	6
Myanmar	7	47	45
Nepal	21	65	14
Oman	77	23	0
Pakistan	5	80	15
Philippines	3	10	87
Saudi Arabia	83	17	0
Singapore	x	x	x

Sri Lanka	0	60	40
Syrian Arab Rep	9	69	22
Thailand	8	19	73
Turkey	12	40	48
United Arab Emirates	90	10	0
Viet Nam	2	10	88
Yemen	34	66	0
<u>OCEANIA</u>	61	27	12
Australia	62	28	10
Fiji	x	x	x
New Zealand	27	4	69
Papua New Guinea	64	24	13
Solomon Islands	x	x	x
<u>NORTH & CENTRAL AMERICA</u>	56	21	23
Belize	36	0	64
Canada	95	5	2
Costa Rica	12	18	71
Cuba	2	14	84
Dominican Rep	18	16	65
El Salvador	0	50	50
Guatemala	25	12	62
Haiti	5	0	95
Honduras	32	4	63
Jamaica	0	25	75
Mexico	23	33	44
Nicaragua	32	13	56
Panama	99	0	1
Trinidad and Tobago	50	0	50
United States	25	36	39
<u>SOUTH AMERICA</u>	59	25	16
Argentina	37	47	17
Bolivia	78	18	4
Brazil	67	15	18
Chile	56	27	17
Colombia	69	11	20
Ecuador	47	12	41
Guyana	98	1	1
Paraguay	84	13	3
Peru	60	36	4
Suriname	91	3	6

Uruguay	0	76	24
Venezuela	0	79	21
<u>EUROPE</u>	15	18	67
Albania	0	28	72
Austria	0	39	61
Belgium	0	15	85
Bulgaria	0	37	63
Czechoslovakia (former)	1	28	72
Denmark	0	0	100
Finland	52	30	18
France	1	14	85
Germany	0	20	80
Greece	0	14	86
Hungary	1	7	93
Iceland	78	1	21
Ireland	0	0	100
Italy	0	16	84
Netherlands	0	2	98
Norway	66	21	13
Poland	0	13	87
Portugal	0	20	80
Romania	1	23	77
Spain	1	16	82
Sweden	57	17	26
Switzerland	0	35	65
United Kingdom	1	2	97
Yugoslavia (former)	1	24	76
<u>U.S.S.R. (former)</u>	57	16	28
Armenia	x	x	x
Azerbaijan	x	x	x
Belarus	x	x	x
Estonia	x	x	x
Georgia	x	x	x
Kazakhstan	x	x	x
Kyrgyzstan	x	x	x
Latvia	x	x	x
Lithuania	x	x	x
Moldova	x	x	x
Russian Federation	x	x	x
Tajikistan	x	x	x

Turkmenistan	x	x	x
Ukraine	x	x	x
Uzbekistan	x	x	x

International and Marine Protected Areas, 1993

Areas in Million Hectares

	World Heritage Sites		Biosphere Reserves		Wetlands of International Importance		Marine & coastal protected zones	
	No.	Area	No.	Area	No.	Area	No.	Area
Africa	28	28.1	43	20.6	53	4.2	43	9.6
Asia	16	1.7	39	13.2	49	2.4	189	14.0
North & Central America	22	21.5	71	98.2	64	15.5	214	135.8
South America	9	4.0	26	16.9	13	2.8	94	24.7
Europe	11	0.7	99	6.8	353	4.2	180	7.7
USSR (former)	1	0.1	22	10.9	13	3.0	22	4.9
Oceania	13	44.8	13	4.7	45	4.5	229	14.6
World	100	100.9	312	171.3	590	36.6	977	211.3

Source: Table 20.2, World Resources 1994-95, Oxford University Press, 1994

Niger	—	—	1	7,736	1	220	NA	NA
Nigeria	1	—	0	0	—	—	0	0
Rwanda	1	15	—	—	—	—	NA	NA
Senegal	3	1,094	2	929	4	100	4	81
Sierra Leone	—	—	—	—	—	—	0	0
Somalia	—	—	—	—	—	—	0	0
South Africa	—	—	—	—	12	228	13	152
Sudan	2	1,901	0	0	—	—	0	0
Swaziland	—	—	—	—	—	—	NA	NA
Tanzania	2	2,338	4	7,381	—	—	0	0
Togo	—	—	—	—	—	—	0	0
Tunisia	4	32	1	13	1	13	1	4
Uganda	1	220	0	0	1	15	0	0
Zaire	3	298	4	5,482	—	—	0	0
Zambia	—	—	1	4	2	333	NA	NA
Zimbabwe	—	—	2	1,095	—	—	NA	NA
ASIA	39	13,166	16	1,676	49	2,377	189	13,987
Afghanistan	—	—	0	0	—	—	NA	NA
Bangladesh	—	—	0	0	1	60	3	32
Bhutan	—	—	—	—	—	—	NA	NA
Cambodia	—	—	0	0	—	—	0	0
China	9	2,247	4	249	6	529	20	1,184
India	—	—	5	281	6	193	14	474
Indonesia	6	1,482	2	298	1	163	68	8,941
Iran, Islamic Rep	9	2,610	0	0	18	1,358	3	725
Iraq	—	—	0	0	—	—	0	0
Israel	—	—	—	—	—	—	1	31
Japan	4	116	0	0	4	10	30	637
Jordan	—	—	0	0	1	7	0	0
Korea, Dem People's Rep	1	132	—	—	—	—	0	0
Korea, Rep	1	37	0	0	—	—	3	285
Kuwait	—	—	—	—	—	—	0	0
Lao People's Dem Rep	—	—	0	0	—	—	NA	NA
Lebanon	—	—	0	0	—	—	0	0
Malaysia	—	—	0	0	—	—	9	52
Mongolia	1	5,300	0	0	—	—	NA	NA
Myanmar	—	—	—	—	—	—	0	0
Nepal	—	—	2	208	1	18	NA	NA
Oman	—	—	0	0	—	—	1	1
Pakistan	1	31	0	0	9	21	1	16

Philippines	2	1,174	0	0	—	—	5	31
Saudi Arabia	—	—	0	0	—	—	2	475
Singapore	—	—	—	—	—	—	0	0
Sri Lanka	2	9	1	9	1	6	6	303
Syrian Arab Rep	—	—	0	0	—	—	0	0
Thailand	3	26	1	622	—	—	10	625
Turkey	—	—	1	10	—	—	3	114
United Arab Emirates	—	—	—	—	—	—	0	0
Viet Nam	—	—	0	0	1	12	2	34
Yemen	—	—	0	0	—	—	0	0
<u>OCEANIA</u>	13	4,745	13	44,848	45	4,519	229	14,547
Australia	12	4,743	10	42,168	40	4,481	184	13,035
Fiji	—	—	0	0	—	—	1	4
New Zealand	—	—	2	2,677	5	38	32	1,386
Papua New Guinea	—	—	—	—	—	—	0	0
Solomon Islands	—	—	—	—	—	—	0	0
<u>NORTH & CENTRAL AMERICA</u>	71	98,150	22	21,541	64	15,515	214	135,781
Belize	—	—	0	0	—	—	x	x
Canada	6	1,050	6	14,710	30	13,016	48	7,106
Costa Rica	2	729	1	585	2	30	7	194
Cuba	4	324	0	0	—	—	6	227
Dominican Rep	—	—	0	0	—	—	7	270
El Salvador	—	—	0	0	—	—	0	0
Guatemala	2	1,236	1	58	1	48	3	13
Haiti	—	—	0	0	—	—	0	0
Honduras	1	500	1	500	—	—	1	350
Jamaica	—	—	0	0	—	—	0	0
Mexico	6	1,288	1	528	1	47	11	1,119
Nicaragua	—	—	0	0	—	—	0	0
Panama	1	597	2	804	1	81	6	898
Trinidad & Tobago	—	—	—	—	—	—	2	3
United States	44	22,335	10	4,357	11	1,192	107	54,317
<u>SOUTH AMERICA</u>	26	16,866	9	4,043	13	2,820	94	24,717
Argentina	5	2,410	2	655	3	82	7	1,499
Bolivia	3	435	0	0	1	5	NA	NA
Brazil	1	4,937	1	170	—	—	20	2,032
Chile	8	2,417	0	0	1	5	32	10,050
Colombia	3	2,514	0	0	—	—	9	615
Ecuador	2	1,446	2	1,038	2	90	5	8,975
Guyana	—	—	0	0	—	—	0	0

Paraguay	—	—	0	0	—	—	NA	NA
Peru	3	2,507	4	2,180	3	2,416	4	710
Suriname	—	—	—	—	1	12	5	128
Uruguay	1	200	0	0	1	200	1	3
Venezuela	—	—	0	0	1	10	11	704
<u>EUROPE</u>	99	6,765	11	661	353	4,248	180	7,700
Albania	—	—	0	0	—	—	5	28
Austria	4	28	—	—	7	103	NA	NA
Belgium	—	—	—	—	6	10	0	0
Bulgaria	17	25	2	41	4	2	0	0
Czechoslovakia (former)	9	563	0	0	8	17	NA	NA
Denmark	—	—	0	0	27	734	3	12
Finland	1	350	0	0	11	101	0	0
France	6	576	1	12	8	423	27	849
Germany	12	1,259	0	0	31	661	14	732
Greece	2	9	0	0	11	107	13	84
Hungary	5	129	0	0	13	110	0	0
Iceland	—	—	—	—	2	58	5	509
Ireland	2	9	0	0	21	13	0	0
Italy	3	4	0	0	46	57	18	211
Netherlands	1	260	—	—	15	313	10	54
Norway	1	1,555	0	0	14	16	12	3,508
Poland	4	161	1	5	5	7	4	73
Portugal	1	—	0	0	2	31	8	132
Romania	3	614	1	547	1	647	0	0
Spain	11	716	1	4	17	102	9	75
Sweden	1	97	0	0	30	383	5	12
Switzerland	1	17	0	0	8	7	NA	NA
United Kingdom	13	44	2	1	57	215	35	1,194
Yugoslavia (former)	2	350	3	51	7	131	12	227
<u>U.S.S.R. (former)</u>	22	10,930	1	88	13	2,993	22	4,925
Armenia	x	x	x	x	x	x	x	x
Azerbaijan	x	x	x	x	1	133	x	x
Belarus	1	76	1	88	x	x	x	x
Estonia	1	1,560	x	x	1	49	x	x
Georgia	x	x	x	x	x	x	x	x
Kazakhstan	x	x	x	x	3	1,238	x	x
Kyrgyzstan	1	24	x	x	x	x	x	x
Latvia	x	x	x	x	x	x	x	x
Lithuania	x	x	0	0	x	x	x	x

Moldova	x	x	x	x	x	x	x	x
Russian Federation	14	9,029	0	0	3	1,168	x	x
Tajikistan	x	x	0	0	1	6	x	x
Turkmenistan	1	35	x	x	1	189	x	x
Ukraine	3	160	0	0	3	211	x	x
Uzbekistan	1	48	x	x	x	x	x	x

Marine Fisheries - Annual Catch 1989-91
Yield and Estimated Potential

All figures in million metric tons

	Marine Fish		Cephalopods & Crustaceans		Total	
	Annual Catch	Poten- tial	Annual Catch	Poten- tial	Annual Catch	Poten- tial
Atlantic Ocean	18.3	25.5- 33.3	1.9	2.7- 3.9	20.2	28.2- 37.2
Pacific Ocean	45.0	31.0- 45.1	3.3	3.1- 4.4	48.3	34.1- 49.5
Indian Ocean	5.4	4.7- 7.1	0.6	0.6- 0.9	6.0	5.3- 8.0
Mediterranean & Black Sea	1.2	1.1- 1.4	0.2	0.2	1.4	1.2- 1.6
Antarctic	0.1	NA	0.3	NA	0.4	NA
Arctic	0.0	NA	0.0	NA	0.0	NA
World	69.9	62.3- 86.9	6.2	6.5- 9.3	76.1	68.8- 96.2

Source: Table 22.4, World Resources 1994-95, Oxford University Press, 1994

Coastal Resources - Offshore Oil and Gas

	Annual Production				Proven Reserves	
	Oil (million tons)		Gas (billion cubic metres)		Oil (billion tons)	Gas (trill- ion cubic metres)
	1982	1992	1982	1992	1992	1992
Africa	63.8	117.7	6.1	2.1	3.5	4.0
Asia	229.4	309.3	19.5	73.7	18.8	6.8
Oceania	17.8	25.0	7.4	20.0	0.3	0.9
North & Central America	143.6	128.4	156.5	120.6	6.7	3.7
South America	61.2	73.4	1.1	13.2	1.7	1.0
Europe	132.8	181.3	87.3	117.2	5.2	5.0
USSR (former)	8.8	30.9	14.7	10.4	0.3	-
World	657.4	866.0	292.6	357.2	36.5	21.4

Coastal Resources - Offshore Oil and Gas

	Annual Production				Proven Reserves	
	Oil (thousand tons)		Gas (million cubic metres)		Oil (million tons)	Gas (billion cubic metres)
	1982	1992	1982	1992	1992	1992
AFRICA	63,792	117,677	6,080	2,119	3,479	3,957
Algeria	0	0	0	0	0	0
Angola	4,365	19,422	0	486	241	57
Benin	0	0	0	0	117	0
Cameroon	0	7,470	0	52	76	110
Cape Verde	0	0	0	0	0	0
Comoros	0	0	0	0	0	0
Congo	4,316	7,022	0	72	150	76
Cote d'Ivoire	467	0	0	41	3	100
Djibouti	0	0	0	0	0	0
Egypt	28,386	0	755	0	367	142
Equatorial Guinea	0	996	0	0	1	3
Ethiopia	0	0	0	0	0	0
Gabon	5,105	11,952	81	0	190	11
Gambia, The	0	0	0	0	0	0
Ghana	65	598	76	0	4	0
Guinea	0	0	0	0	0	0
Guinea-Bissau	0	0	0	0	0	0
Kenya	0	0	0	0	0	0
Liberia	0	0	0	0	0	0
Libya	0	6,972	0	0	109	3
Madagascar	0	0	0	0	0	0
Mauritania	0	0	0	0	0	0
Mauritius	0	0	0	0	0	0
Morocco	0	0	0	0	0	0
Mozambique	0	0	0	0	0	0
Namibia	0	0	0	0	0	0
Nigeria	18,498	61,254	5,168	1,468	2,040	3,398
Reunion	0	0	0	0	0	0
Senegal	0	0	0	0	136	0
Seychelles	0	0	0	0	0	0
Sierra Leone	0	0	0	0	0	0
Somalia	0	0	0	0	0	0
South Africa	0	0	0	0	0	0

Sudan	0	0	0	0	0	0
Tanzania	0	0	0	0	0	28
Togo	0	0	0	0	0	0
Tunisia	1,520	1,245	0	0	34	0
Zaire	1,070	747	0	0	11	28
ASIA	229,432	309,308	19,492	73,691	18,784	6,805
Bahrain	0	0	0	0	13	0
Bangladesh	0	0	0	0	0	0
Brunei	6,026	7,470	8,786	7,442	137	212
Cambodia	0	0	0	0	14	99
China	0	2,241	0	496	560	120
Cyprus	0	0	0	0	0	0
Hong Kong	0	0	0	0	0	0
India	12,799	35,856	1,457	6,202	1,047	430
Indonesia	26,677	57,270	5,685	7,236	286	1,447
Iran, Islamic Rep	0	23,904	0	2,791	408	453
Iraq	0	0	0	0	0	0
Israel	0	0	0	0	0	0
Japan	43	697	286	72	1	0
Jordan	0	0	0	0	0	0
Korea, Dem People's Rep	0	0	0	0	0	0
Korea, Rep	0	0	0	0	0	0
Kuwait	0	0	0	0	0	0
Lebanon	0	0	0	0	0	0
Macao	0	0	0	0	0	0
Malaysia	15,050	35,308	0	18,606	530	1,529
Maldives	0	0	0	0	0	0
Myanmar	0	0	0	0	109	54
Oman	0	797	0	413	11	28
Pakistan	0	0	0	0	0	0
Philippines	822	1,245	0	0	39	57
Qatar	8,341	9,064	0	1,437	0	0
Saudi Arabia	119,122	78,684	0	6,099	7,888	1,331
Singapore	0	0	0	0	0	0
Sri Lanka	0	0	0	0	0	0
Syrian Arab Rep	0	0	0	0	0	0
Thailand	0	1,992	0	7,029	65	357
Turkey	0	0	0	0	0	7
United Arab Emirates	40,553	49,800	3,227	7,598	7,072	396
Viet Nam	0	4,980	0	8,269	544	283

Yemen	0	0	0	0	60	0
OCEANIA	17,773	24,950	7,370	19,950	313	935
Australia	17,337	24,153	5,685	16,952	258	538
Fiji	0	0	0	0	0	0
New Zealand	435	797	1,685	2,998	18	82
Papua New Guinea	0	0	0	0	37	314
Solomon Islands	0	0	0	0	0	0
<u>NORTH & CENTRAL AMERICA</u>	143,613	128,384	156,517	120,641	6,659	3,674
Antigua and Barbuda	0	0	0	0	0	0
Bahamas	0	0	0	0	0	0
Barbados	0	0	0	0	0	0
Belize	0	0	0	0	0	0
Bermuda	0	0	0	0	0	0
Canada	0	498	0	0	162	298
Cayman Islands	0	0	0	0	0	0
Costa Rica	0	0	0	0	0	0
Cuba	0	0	0	0	0	0
Dominica	0	0	0	0	0	0
Dominican Rep	0	0	0	0	0	0
El Salvador	0	0	0	0	0	0
Greenland	0	0	0	0	0	0
Grenada	0	0	0	0	0	0
Guadeloupe	0	0	0	0	0	0
Guatemala	0	0	0	0	0	0
Haiti	0	0	0	0	0	0
Honduras	0	0	0	0	0	0
Jamaica	0	0	0	0	0	0
Martinique	0	0	0	0	0	0
Mexico	81,604	85,656	9,261	11,370	5,712	1,926
Nicaragua	0	0	0	0	0	0
Panama	0	0	0	0	0	0
Trinidad & Tobago	6,731	6,922	5,047	5,799	78	261
United States	55,278	35,308	142,208	103,471	707	1,189
<u>SOUTH AMERICA</u>	61,233	73,405	1,074	13,179	1,727	953
Argentina	0	0	0	0	31	57
Brazil	8,810	26,145	49	7,236	631	2
Chile	0	847	0	569	54	65
Colombia	0	0	1,024	0	10	40
Ecuador	0	0	0	0	5	20
French Guiana	0	0	0	0	0	0

Guyana	0	0	0	0	0	0
Peru	1,323	3,685	0	0	31	4
Suriname	0	0	0	0	0	0
Uruguay	0	0	0	0	0	0
Venezuela	51,101	42,728	0	5,375	966	765
EUROPE	132,799	181,272	87,263	117,209	5,152	5,024
Albania	0	0	0	0	67	0
Belgium	0	0	0	0	0	0
Bulgaria	0	0	0	0	0	0
Denmark	1,693	6,474	0	3,101	35	93
Finland	0	0	0	0	0	0
France	0	0	0	0	0	0
Germany	0	398	0	0	11	3
Greece	0	299	0	0	4	11
Iceland	0	0	0	0	0	0
Ireland	0	0	1,551	2,067	0	23
Italy	498	3,685	10,523	3,618	8	227
Malta	0	0	0	0	0	0
Netherlands	0	2,191	11,071	17,573	18	283
Norway	26,606	89,640	25,842	32,044	2,364	3,088
Poland	0	0	0	0	27	0
Portugal	0	0	0	0	0	0
Romania	0	697	0	0	18	0
Spain	1,413	697	0	920	1	7
Sweden	0	0	0	0	0	0
United Kingdom	102,588	77,190	38,277	57,886	2,598	1,289
Yugoslavia (former)	0	0	0	0	1	0
U.S.S.R. (former)	8,815	30,926	14,678	10,337	315	17
Azerbaijan	x	19,920	x	0	272	0
Estonia	x	0	x	0	0	0
Georgia	x	0	x	0	0	0
Kazakhstan	x	0	x	0	0	0
Latvia	x	0	x	0	0	0
Lithuania	x	0	x	0	0	0
Russian Federation	x	10,558	x	10,337	41	17
Turkmenistan	x	398	x	0	2	0
Ukraine	x	50	x	0	0	0
Uzbekistan	x	0	x	0	0	0

Coastal Resources - Shipping
1988-90

Million Metric Tons

	Average Annual Volume of Goods Loaded & Unloaded		
	1988-90		
	Crude Petroleum	Petroleum Products	Dry Cargo
Africa	382.5	44.3	285.7
Asia	947.2	306.5	1,392.6
Oceania	14.4	12.0	286.6
North & Central America	370.4	151.2	800.7
South America	111.6	41.0	302.1
Europe	562.0	296.8	1,302.5
USSR (former)	69.9	51.2	123.0
World	2,458.0	903.0	4,493.2

Coastal Resources - Shipping
1988-1990

Thousand Metric Tons

	Average Annual Volume of Goods Loaded & Unloaded		
	1988-1990		
	Crude Petroleum	Petroleum Products	Dry Cargo
AFRICA	382,522	44,255	285,737
Algeria	29,110	24,409	15,266
Angola	18,438	376	2,749
Benin	31	429	743
Cameroon	8,098	1,264	3,704
Cape Verde	x	x	x
Comoros	x	x	115
Congo	6,172	246	3,519
Cote d'Ivoire	1,849	1,670	6,422
Djibouti	x	652	684
Egypt	146,855	4,204	25,351
Equatorial Guinea	x	x	165
Ethiopia	763	476	2,444
Gabon	10,341	217	607
Gambia, The	x	24	348
Ghana	1,149	243	2,922
Guinea	x	132	11,451
Guinea-Bissau	x	26	285
Kenya	2,173	109	5,401
Liberia	462	77	18,375
Libya	48,241	4,545	7,242
Madagascar	x	398	1,135
Mauritania	x	107	9,862
Mauritius	x	321	1,992
Morocco	4,910	140	28,990
Mozambique	515	121	5,098
Namibia	x	x	x
Nigeria	73,373	1,018	10,673
Reunion	x	203	845
Senegal	177	367	4,770
Seychelles	x	118	148
Sierra Leone	189	16	1,745
Somalia	498	48	969
South Africa	20,842	286	88,307

Sudan	1,294	87	3,460
Tanzania	688	742	2,532
Togo	x	124	1,458
Tunisia	4,330	937	13,762
Zaire	2,024	50	1,816
ASIA	947,243	306,454	1,392,641
Bahrain	x	12,658	4,452
Bangladesh	1,207	889	8,546
Brunei	8,579	5,174	1,266
Cambodia	x	x	109
China	30,909	4,993	120,377
Cyprus	545	502	4,586
Hong Kong	x	7,654	55,646
India	18,597	5,841	45,445
Indonesia	46,975	26,235	32,817
Iran, Islamic Rep	97,160	4,629	13,291
Iraq	x	x	x
Israel	6,463	1,412	15,593
Japan	189,707	81,238	499,734
Jordan	x	x	17,619
Korea, Dem People's Rep	3,258	1,034	1,812
Korea, Rep	35,995	9,678	152,628
Kuwait	41,372	17,319	8,288
Lebanon	23	205	1,058
Macao	x	316	4,354
Malaysia	22,229	14,164	53,703
Maldives	x	5	94
Myanmar	x	55	1,423
Oman	31,752	192	2,401
Pakistan	4,732	2,891	14,633
Philippines	9,690	1,222	26,966
Qatar	15,602	785	2,662
Saudi Arabia	141,697	38,104	44,591
Singapore	44,854	44,900	64,088
Sri Lanka	1,507	438	10,089
Syrian Arab Rep	16,233	3,287	6,070
Thailand	7,211	2,317	47,178
Turkey	84,837	8,130	40,205
United Arab Emirates	65,491	5,001	13,494
Viet Nam	x	347	1,461

Yemen	4,002	1,750	3,523
<u>OCEANIA</u>	14,395	12,046	286,622
Australia	10,974	8,328	260,610
<u>Fiji</u>	x	497	691
New Zealand	3,421	984	14,885
Papua New Guinea	x	897	3,339
Solomon Islands	x	34	601
<u>NORTH & CENTRAL AMERICA</u>	370,382	151,238	800,718
Antigua and Barbuda	x	62	83
Bahamas	10,524	3,702	3,222
Barbados	107	51	573
Belize	x	106	306
Bermuda	x	363	254
Canada	16,623	8,981	201,526
Cayman Islands	1,357	36	117
Costa Rica	464	336	2,662
Cuba	5,850	3,821	14,244
Dominica	x	5	93
Dominican Rep	1,630	785	4,358
El Salvador	716	17	1,140
Greenland	x	187	392
Grenada	x	22	71
Guadeloupe	x	370	1,221
Guatemala	683	204	4,232
Haiti	x	11	838
Honduras	397	204	1,849
Jamaica	1,210	1,203	10,122
Martinique	231	282	876
Mexico	71,817	7,377	19,833
Nicaragua	495	183	1,280
Panama	1,192	441	1,939
Trinidad & Tobago	6,518	2,670	5,638
United States	237,010	112,707	519,921
<u>SOUTH AMERICA</u>	111,570	41,009	302,118
Argentina	260	3,336	32,367
Brazil	31,467	3,607	184,934
Chile	2,462	230	17,333
Colombia	9,442	6,901	15,231
Ecuador	7,423	1,280	3,472
French Guiana	x	137	273

Guyana	x	474	1,919
Peru	1,175	857	12,504
Suriname	x	615	6,185
Uruguay	975	9	1,123
Venezuela	58,367	23,564	26,768
EUROPE	562,016	296,790	1,302,488
Albania	x	71	1,673
Belgium	20,598	20,609	110,975
Bulgaria	10,659	871	15,311
Denmark	6,303	5,888	32,753
Finland	10,723	6,880	39,495
France	68,135	40,443	110,786
Germany	x	17,695	134,357
Greece	15,407	4,590	26,680
Iceland	x	557	2,407
Ireland	3,405	1,585	18,127
Italy	88,893	46,074	100,510
Malta	x	564	1,546
Netherlands	87,630	47,442	226,503
Norway	44,653	5,779	36,468
Poland	1,383	3,798	42,436
Portugal	7,750	2,833	16,601
Romania	16,192	6,947	21,831
Spain	47,932	22,958	89,717
Sweden	15,547	16,462	73,950
United Kingdom	86,127	41,179	176,820
Yugoslavia (former)	8,827	3,044	22,946
U.S.S.R. (former)	69,858	51,202	122,961
Azerbaijan	x	x	x
Estonia	x	x	x
Georgia	x	x	x
Kazakhstan	x	x	x
Latvia	x	x	x
Lithuania	x	x	x
Russian Federation	x	x	x
Turkmenistan	x	x	x
Ukraine	x	x	x
Uzbekistan	x	x	x

Matters to be taken into consideration when
addressing issues raised in the
background paper

Coastal Zone.

Issue 1: What are the scientific and technological parameters that need to be addressed in this connection.

Some of these could be:

- . Monitoring changes in the marine environment and its living resources
- . Remote sensing
- . Building standards, building codes for coastal areas, ways of combating likely sea rise
- . Energy efficiency: reducing greenhouse gas emissions using renewable sources like wind energy, wave energy, biomass conversion, OTEC etc.
- . Waste water treatment including recycling
- . Treatment of solid wastes including recycling
- . Conversion / replacement of obsolete, polluting technologies;
- . Technology acquisition including selection and development
- . Sustainable fisheries management
- . Aquaculture mariculture development for
 - * food
 - * pharmaceutical and chemical products
- . Post-harvest conservation methods
- . Genetic engineering and its impact on ocean resources
- . Sustainable use of nonliving resources (sand and gravel, coal, tin, etc.)
- . Port management including management of new shipping technologies
- . Management of tourist activities
- . Environmental impact assessment using state-of-the-art technologies
- . Risk management
- . Disaster preparedness
- . Environmental accounting
- . Cost-benefit analysis in a sustainable development matrix

- . Deficiencies in the country/region regarding the above

- . Suggested remedial measures for overcoming the identified deficiencies including, inter alia:
 - . development of human resources
 - . access to environmentally safe technologies
 - . funding

Some strategies for the above could be:

- . Training programmes

- . Establishing data dissemination mechanisms
- . Cooperation with competent international organisations
- . Joint ventures for technology development

Issue 2: Whether integrated institutional mechanisms exist to ensure sustainable development of the marine environment.

Some matters to be taken note of in addressing the above issue would be:

- . Indigenous and traditional ownership patterns, management, and conservation systems
- . Fisheries cooperatives
- . Women's organisations
- . Scientific institutions
- . NGOs
- . Port authorities
- . Local authorities
- . Municipalities and their links with national governments
- . Municipalities-national, regional and international cooperation
- . Regional cooperation in marine science: data collection, dissemination, utilisation
- . Regional technological cooperation: acquisition and development strategies
- . Surveillance and enforcement: national and regional systems
- . Existing institutional models for integrated coastal and marine management
- . Adaptation of such models to different economic, social and political infrastructures.

Implementation of Programme 1 of Chapter 17

Programme 1: Integrated management and sustainable development of coastal areas, including exclusive economic zones.

The main parameters of programme 1 concern:

- . Possibilities of an integrated policy and decision-making process...to promote compatibility and balance of uses.
- . Identification of existing and projected uses of coastal areas and their interactions.
- . Concentration on well-defined coastal management related issues.
- . Need for applying preventive and precautionary approaches in project planning and implementation, including prior assessment and systematic observation of the impacts of major projects.
- . Possibility of promoting the development and

application of methods, such as national resource and environmental accounting, that reflect changes in value resulting from uses of coastal and marine areas...

- . Methods of providing access to relevant information and opportunities for consultation and participation in planning and decision-making at appropriate levels.

Issue 3: What environmentally sound technologies are required:

Areas where technologies are necessary could be for:

- . Monitoring of the marine environment
- . Selecting appropriate fishing gear
- . Fish processing
- . Oil pollution combatting
- . Sewage treatment & recycling
- . Garbage recycling and re-usage
- . Controlling emissions of greenhouse gases.

Marine Pollution.

Implementation of Programme 2 of Chapter 17 of Agenda 21

Programme 2: Marine environmental protection.

The main parameters of programme 2 of Agenda 21 concern:

- . Prevention, reduction and control of degradation of the marine environment so as to maintain and improve its life support and productive capacities (General Objective).
- . Application of preventive, precautionary and anticipatory approaches to avoid degradation and reduction of ...adverse effects.
- . Ensuring prior assessment of activities which may have significant adverse impacts...
- . Integration of protection of the marine environment into relevant general environmental, social and economic development policies.
- . Developing of economic incentives...to apply clean technologies...the internalisation of environmental costs such as the polluter pays principle...
- . Improvement of the living standards of coastal populations, particularly in the developing countries...

Issue 4: What steps can be taken in the South to minimise marine pollution consistent with the objective of eliminating poverty and raising standards of living?

A possible solution could be the taking up of dual-purpose or multi-purpose projects, under integrated management, serving both purposes simultaneously, such as:

- . Energy efficiency enhancement
- . Bio-gas production from sewage
- . Garbage recycling
- . Integrated industrial management, where one factory utilizes the waste products of another, following the biological pattern of aquatic polycultures
- . Slum clearance, sewage and sewage treatment facilities, which improve public health and living standards and reduce pollution
- . Improved public education, which serves both purposes.

Issues 5 & 6: How can environmentally safe technologies be made available to the South? What institutional mechanisms can be developed to ensure the development and acquisition of such technologies by the South?

- National educational measures
 - . Building national infrastructure
 - . Training of trainers

Establishment of Regional Centres for Marine Science and Technology (implementation of Articles 276 and 277 of the Law of the Sea Convention)

Cooperation with competent international organisations (UNIDO, IOC/UNESCO, FAO, UNEP, IMO, etc.)

Joint ventures with private sector.

Marine Resources - Living and Nonliving

Issue 7: How to have sustainable development of marine resources both in the capture and aquaculture sectors

- Stock assessment
- Environmental impact
 - . Pollution
 - . Habitat destruction
 - . Temperature and/or current changes
 - . Overfishing, national, regional
 - . Interaction of natural and man-made causes of depletion
 - . Interaction between capture fisheries and aquaculture
 - . Sustainability, public health, trade
 - . Straddling stocks management
 - . Management measures, national, regional.

Issue 8: What institutional, legal, financial, manpower development and technological steps are necessary in this regard?

Linkages between local, national, regional management of the manpower, technology development and funding systems.

Implementation of Programme 3 and 4 of Chapter 17 of Agenda 21

Programme 3: Sustainable use and conservation of marine living resources of the high seas.

- . Sustainable use and conservation of marine living resources of the high seas.
- . Development and increase in the potential of marine living resources to meet human nutritional needs and social, economic and development goals.
- . Maintenance or restoration of populations of marine species to levels which can support maximum sustainable yield levels...
- . Promotion of the development and use of selective fishing gear and practices that minimize waste...
- . Ensuring effective fisheries monitoring and enforcement...
- . Protecting and restoring endangered marine species.
- . Preserving habitats and other ecologically sensitive areas.
- . Promoting scientific research with respect to the marine living resources in the high seas.

Programme 4: Sustainable use and conservation of marine living resources under national jurisdiction.

- . Sustainable use and conservation of marine living resources under national jurisdiction.
- . ..Obtaining full social and economic benefits from sustainable utilization of marine living resources...(General Objective).
- . ..Meeting human nutritional needs and social, economic and development goals...
- . Taking into account traditional knowledge and interests of local communities, small-scale artisanal fishermen and indigenous people in development and management programmes.
- . Maintaining or restoring populations of marine species at levels which can produce the maximum sustainable yield...
- . Promoting ... selective fishing gear and practices that minimize waste of catch...
- . Protecting and restoring endangered marine species.
- . Preserving rare or fragile ecosystems ...habitats and other ecologically sensitive areas.

Sustainable Ocean Development, the Law of the Sea and the Secretary General's Agenda

Issue 9: Whether the actions taken by States so far can be considered to be adequate? If not, what are the reasons for not taking adequate action? And what needs to be done to promote the taking of such action?

- . Information; awareness enhancement; role of media; role of NGOs
- . Education and training; development of human resources, from pre-school to adult education; curriculum development; leadership seminars involving government and private sector.
- . Building of national infrastructure.

Issue 10: Whether the cooperation by States in the spheres of enforcement, conservation, science and technology, including the setting up of international, regional and subregional institutions can be considered to be adequate? If not, what more needs to be done?

- . Improvement of coordination and integration of policies of existing regional institutions, regional offices of global institutions, NGOs;
- . Improvement of interaction with continental regional organisations and institutions (U.N. Regional Commissions; Regional Banks).
- . Marine-centres and organisations provide excellent mechanisms for inter-regional and inter-continental co-operation (e.g., the Mediterranean, between Europe, Africa, and Asia; the Indian Ocean, between Africa and Asia, etc.)

Issue 11: Whether the specialised agencies of the United Nations (FAO, IMO, UNESCO/IOC, UNEP, UNIDO, WMO) have been cooperating with States, especially developing States, to further the prospects of sustainable development? If not, what needs to be done?

Issues 12 & 13: Identify the deficiencies that do not enable developing countries to enjoy their rights under the LOS Convention and indicate what needs to be done.

Issue 14: Whether proper linkages can be established between the mechanisms for sustainable ocean development and the Secretary General's agendas for peace and development.

- . Institutional constraints: antiquated sectoralised structures
- . Financial constraints, need for new sources for financing projects
- . Intellectual constraints: Lack of a generally acceptable concept of sustainable development and its implications. Need for policy research.
- . Technological constraints
- . Manpower constraints
- . Mobilising new sources of funding.

Implementation of Programme 6 of Chapter 17 of Agenda 21.

- Programme 6: Strengthening international, including regional, cooperation and coordination.
- . Strengthening international, including regional, cooperation and coordination.
 -Promoting institutional arrangements...to support the implementation of programme areas in Chapter 17. (General Objective)
 - . Integrating relevant sectoral activities...
 - . Promoting effective information exchange and...institutional linkages...
 - . Promoting within the UN system regular intergovernmental review and consideration of environment and development issues with respect to marine and coastal areas.
 - . Promoting the effective operation of coordinating mechanisms...in the UN system...on environment/development in marine and coastal areas and links with international development bodies.

Financial Requirements.

In preparation for the Rio Conference, the UNCED Secretariat made some rather detailed calculations of the costs for the implementation of Agenda 21 as well as the funding from international sources that should be available to assist developing countries in this process. Since there was no agreement on the figures, they were omitted in the final version. A number of factors involved, in fact, simply cannot be quantified, and, costs of programmes are overlapping. The figures are nevertheless indicative of orders of magnitude. For Chapter 17 they are as follows:

Average annual cost (1993-2000)

Prog 1: Integrated coastal management	\$ 6,000 million
Prog 2: Marine environmental protection	\$ 200 million
Prog 3: Living resources - high seas	\$ 12 million
Prog 4: Living resources - national jurisdiction	\$ 6,000 million
Prog 5: Critical uncertainties in ocean-air interface	\$ 750 million
Prog 6: International cooperation	\$ 50 million
Prog 7: Islands development	\$ 130 million
Total annual cost	\$ 13,142 million

Dividing these costs among approximately 180 States, the average cost per State would be \$ 73 million.

Funding available from international sources was estimated as follows:

Average annual cost (1993-2000)

Prog 1: Integrated coastal management	\$	50 million
Prog 2: Marine environmental protection	\$	200 million
Prog 3: Living resources - high seas	\$	12 million
Prog 4: Living resources - national jurisdiction	\$	60 million
Prog 5: Critical uncertainties in ocean-air interface	\$	480 million
Prog 6: International cooperation	\$	50 million
Prog 7: Islands development	\$	50 million
Total annual cost	\$	902 million

Dividing by approximately 120 developing countries, the average annual contribution from international funding sources would be roughly \$ 7.5 million. Net total annual cost per average developing country would be in the order of \$ 73 million - \$ 7.5 million = \$ 65.5 million. Clearly, additional international funding, from new sources, must be found.

Restructuring of the United Nations.

Issue 15: How should the UN be restructured to adequately deal with oceanic matters at both the international and regional levels?

The existing system of UN relating to the oceans including the collaboration of UN agencies through the ACC subcommittee for Ocean and Coastal Areas:

- . UNESCO/IOC
- . UNDOALOS
- . IMO
- . FAO
- . UNIDO
- . WMO
- . UNDP
- . World Bank
- . Regional Banks
- . GEF.

Deficiencies existing therein.

How can Security Council / UN General Assembly / Commission for Sustainable Development be made effective fora for ocean affairs?

What inputs can UN Agencies make into the work of the Commission on Sustainable Development, and how?

What interlinkages between UN Agencies can be considered to get an integrated policy mechanism?

A N N E X C

Work done by IOI in relation to Ocean Governance
1991-95

To assist the Committee in the commissioning of papers, details of what is available with IOI is presented below:

CONFERENCES

During the last five years, the International Ocean Institute has held the following Pacem in Maribus Conferences:

Pacem in Maribus XIX Lisbon, 18-21 Nov., 1991	Ocean Governance: Sustainable development of the seas
Pacem in Maribus XX Malta, 1-5 Nov., 1992	Ocean Governance: A model for global governance in the twenty-first century
Pacem in Maribus XXI Takaoka, 6-9 Sept., 1993	Ocean Governance: A model for regional seas in the twenty-first century
Pacem in Maribus XXII Madras, 4-8 Dec., 1994	Sustainable Development and Regional Cooperation
Pacem in Maribus XXIII Costa Rica, 3-6 Dec., 1995	Ocean Governance: Law of the Sea and the UN secretary-generals' agenda for peace.

The list of papers presented in the global conferences is at Annex 1.

EXPERTS MEETINGS

The IOI also held the following experts meetings in 1994:

- The UN Second Generation Experts Meeting
in association with
the Foundation for International Studies
Malta, 3-5 October, 1994
(list of papers at Annex 2).
- Workshop on marine technology cooperation in the
Indian Ocean region
in cooperation with IIT Madras
Madras, 1-2 December 1994
(list of papers at Annex 3).

MONOGRAPHS PREPARED BY IOI

- The Mediterranean Tourist Tax and Environmental Action: Strategies for financing the Mediterranean Action Plan, March 1991.

- The Oceans: Area of future opportunities, September, 1992.
- Traditional Marine Tenure and Sustainable management of Marine Resources in Asia and the Pacific, July, 1994.
- Ocean Governance and Law of the Sea, June, 1995.

International Conferences held by the
Foundation for International Studies and the
University of Malta

1. The International Conference on Islands and Small States: 23-25 May 1991.
2. The International Conference on Business and Economic Development in Middle Eastern and Mediterranean Countries: 25-27 May 1992.
3. Conference on the EC Regional Policy with Special Reference to Islands: 19-20 May 1993.
4. International Workshop on Tourism and Culture in Islands, Cities and Small States: 15-17 November 1993.
5. International Conference on Sustainable Tourism in Islands and Small States: 19-20 November 1993.
6. Public Forum on the Sustainable Development in Islands and Small States: 15 March 1994.
7. International Conference on Banking, Finance and Offshore Activity in Islands and Small States: 19-21 January 1995.

A list of courses and publications of the Foundation for International Studies (FIS) and the University of Malta (UOM) is at Annex 4.

Other documents studied by IOI

1. International Commission on Peace and Food, **Uncommon Opportunities**, Zed Books, London, 1994.
2. The Commission on Global Governance, **Our Global Neighbourhood**, Oxford University Press, London, 1995.
3. World Coast Conference, **Preparing to meet the Coastal Challenges of the 21st Century**, Conference Report, Ministry of Transport, Public Works and Water Management, The Hague, 1994.
4. United Nations, **Global Outlook 2000; An economic, social**

- and environmental perspective**, New York, 1990.
5. United Nations, **The Global Partnership**, New York, 1993.
 6. **World Resources 1994-95**, report of the World Resources Institute in collaboration with UNEP and UNDP, Oxford University Press, 1994.
 7. **The Climate Agenda**, the Report of the Intergovernmental Meeting on the World Climate programme, April, 1993.
 8. Brian Urguhart and Erskine Childers, **A World in Need of Leadership**, Dag Hammarskjold Foundation, Uppsala, Sweden, 1990.
 9. Brian Urguhart and Erskine Childers, **Towards a more Effective United Nations**, Dag Hammarskjold Foundation, Uppsala, Sweden, 1992.
 10. Brian Urguhart and Erskine Childers, **Renewing the United Nations System**, Dag Hammarskjold Foundation, Uppsala, Sweden, 1994.
 11. **World Bank and the Environment**, 1993, 1994, publications.
 12. UNDP, **Human Development Report**, 1994, 1995 publications.
 13. Paolo Fabbri, ed., **Ocean Management in Global Change**, Elsevier Applied Science, London, 1992.
 14. M.S. Swaminathan, ed., **Sustainable Management of Coastal Ecosystems**, Madras, 1993.
 15. Adalberto Vallega, **Sea Management: A theoretical approach**, Elsevier Applied Science, London, 1992.
 16. **General Assembly Resolution on the Law of the Sea**, 1994.
 17. **Report of Secretary General on the Law of the Sea**, 1994.
 18. **The Secretary General's Agenda for Peace**, 1992.
 19. **The Secretary General's Agenda for Development**, 1993.
 20. Boutros-Boutros Ghali, **Building Peace and Development**, UN, New York, 1994.
 21. Daniel S. Sanders and Jon K. Matsuoka, eds., **Peace and Development: An interdisciplinary perspective**, University of Hawaii, 1989.
 22. **The UN Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks**, papers relating thereto.
 23. **The UN Conference on Small Island Developing States**, papers relating thereto.

PACEM IN MARIBUS XIX

Lisbon 18-21 November, 1991

**Ocean Governance: Sustainable development
of the seas**

THEME 1: THE EXISTING FRAMEWORK FOR OCEAN GOVERNANCE

1. **The United Nations Convention on the Law of the Sea: Sustainable development and institutional implications**
Christopher W. Pinto.....
2. **Existing institutional framework and mechanisms**
Satya N. Nandan.....
3. **The significance and cost of ratification of the Law of the Sea Convention 1982**
F.X. Njenga.....
4. **The role of indigenous peoples in ocean governance**
Jon M. Van Dyke.....

THEME 2: OCEAN GOVERNANCE: NATIONAL LEVEL

5. **New structures of decision-making in integrated ocean policy**
Stella Maris Vallejo.....
6. **Environmental accounting and valuation in the marine sector**
Ernst Lutz and Mohan Munasinghe.....

Addendum

- Max Borlin.....
7. **National case-studies: India and Japan**

National institutions of governance in marine affairs in India
Krishan Saigal.....

Some observations on mechanisms for decision-making and the execution of an integrated ocean policy in Japan
Tsutomu Fuse.....

THEME 3: OCEAN GOVERNANCE: REGIONAL LEVEL

8. **The regional seas programme - Integrating environment and development: The next phase**
Stjepan Keckes.....

9. **Fisheries efficiency, resources conservation effectiveness, and institutional innovations**
Jean-Paul Troadec.....
10. **Regional cooperation in non-living resources: Joint management zones**
Francisco Orrego Vicuna.....
11. **Regional centres for marine science and technology**
Krishan Saigal.....
12. **Regional cooperation in marine sciences**
Gunnar Kullenberg and Agustin Ayala-Castanares.....
13. **Regional case-studies: The Baltic Sea, and Indian Ocean**
Regional cooperation in science: The Helsinki Convention for the Baltic
Nikolaus Gelpke.....
The Indian Ocean Marine Affairs Cooperation (IOMAC)
Hiran W. Jayewardene.....

THEME 4: OCEAN GOVERNANCE: GLOBAL LEVEL

14. **Ocean governance and the global picture**
Jan van Ettinger, Alex King and Peter Payoyo.....
15. **The competent international organizations: Internal and external changes**
Thomas A. Mensah.....
16. **Information and communication on the oceans**
Jacques G. Richardson.....
17. **Collective security and the changing role of navies**
Joseph R. Morgan.....
18. **Ocean governance and development: The question of financing**
Ruben P. Mendez.....
19. **An Ocean Assembly**
Alexander Yankov and Mario Ruivo.....
20. **Highlights of reports from United Nations organisations: Ocean governance - Institutional mechanisms for sustainable development in the oceans**
21. **Pacem in Maribus XIX: Background paper**
Elisabeth Mann Borgese.....

PACEM IN MARIBUS XX

Malta, 1-5 November, 1992

Ocean Governance: A model for global governance
in the twenty-first century

THEME 1: GENERAL PRINCIPLES

1. **Humankind as a Subject of International Law**
Rene Jean Dupuy.....
2. **UNCED: North-South Issues**
Jan Pronk.....
3. **Ocean Governance: A model for the twenty-first century..background paper**
International Ocean Institute.....

THEME 2: ENERGY

4. **A World Energy Organisation**
Maxwell Bruce.....
5. **Global Issues in Energy and Climate Change**
Umberto Colombo.....
6. **Harnessing the Motion of the Ocean**
Holt Confer.....
7. **Energy and Sustainable Development in a Long Term Global Perspective**
Jan van Ettinger.....

THEME 3: FOOD

8. **Statement on Present Position of Fisheries**
FAO.....
9. **The Regulation of Seafood Safety**
Robert E. Bowen.....
10. **The Case of the EPO Tuna Fishery: Technical change, natural resource management and international trade**
11. **Biotechnologies and the Commons**

THEME 4: SPACE AND THE ATMOSPHERE

12. **Outer Space - Time for a Fresh Look**
Bhupendra Jasani.....

13. **Submission to the FAO Technical Committee on High Seas Fishing**
Greenpeace.....
14. **CHM Concept in Outer Space**
Vladimir M. Postyshev.....

THEME 5: SCIENCE AND TECHNOLOGY

15. **S & T overview: The Egyptian experiment**
Aboul-Fotouh Abdel Latif.....
16. **Intellectual Property Rights**
Alejandro Nadal Egea.....
17. **Management of Science and Technology by Developing Countries**
Krishan Saigal.....
18. **Vision 2000: Malta and communications technology**
Joe Woods.....

THEME 6: RESTRUCTURING THE UNITED NATIONS

19. **UNCLOS, UNCED and Restructuring the United Nations System**
Elisabeth Mann Borgese.....
20. **The Economics of the Common Heritage: Economic implications of UNCED**
Orio Giarini.....
21. **The post-UNCED Process and the Restructuring of the United Nations System: A view from the South**
Layashi Yaker.....

PACEM IN MARIBUS XXI

Takaoka, 6-9 September, 1993

Ocean Governance: A model for global governance
in the twenty-first centuryTHEME 1: SUSTAINABLE DEVELOPMENT AND REGIONAL SEAS

1. **Cooperation for Development in Regional Seas: General Evaluation of the Regional Seas Programme**
Alicia Barcena.....
2. **ACOPS and Regional Seas**
Viktor Sebek.....
3. **Joint Management Zones: From Regional to Bilateral?**
S. P. Jagota.....
4. **Regional Training Programmes**
Krishan Saigal.....

THEME 2: REGIONAL SEAS IN TRANSITION

5. **The Sea of Japan as Model for Semi-enclosed Seas**
Tsutomu Fuse.....
6. **The Governance of the Mediterranean**
Salvino Busuttil.....
7. **The Gulf of Marine Action Plan**
Aldo Chircop.....
8. **An IOMAC Perspective on Ocean Management in the Indian Ocean Region**
Hiran Jayewardene.....
9. **The Black Sea: New Conditions**
Alexander Yankov.....
10. **A New Cooperation Framework for Technology Development in Latin America and the Caribbean: The Bolivar Programme**
Jean-Francois Pulvenis.....
11. **The South China Sea: Conflict Versus Cooperation**
Zhiguo Gao.....
12. **The Spratly Imbroglia in the Post-Cold War Era**
Mark Valencia.....
13. **The Baltic Sea - Recent Developments**
Renate Platzoder.....

THEME 3: INSIGHTS FROM NATIONAL EXPERIENCE

- 14. **Water Pollution Control Policy in Post-War Japan**
Jun Ui.....
- 15. **Marine Co-Management in the Canadian Arctic: The Features and Implications of Nunavut**
John Merritt.....

THEME 4: REGIONAL SEAS AND GLOBAL ISSUES

- 16. **United Nations Conference on Straddling and Highly Migratory Fish Stocks: An Analysis of the 1993 Sessions**
Moritaka Hayashi.....
- 17. **A World Energy Organisation: Its Rationale and Scope**
Maxwell Bruce and Joseph Rotblat.....
- 18. **Tourism and Regional Seas**
Danielle de St. Jorre.....
- 19. **Coastal Environmental Quality, Seafood Safety, and New International Trading Agreements**
Robert Bowen.....
- 20. **Regional Concepts of Port State Control: A Regional Effort with Global Effects**
Richard Schiferli.....
- 21. **Mutual Cooperation among Navies for Surveillance and Monitoring of the Marine Environment**
BruceDonaldson.....
- 22. **Land-Locked Countries and Regional Seas**
Frank Njenga.....

PACEM IN MARIBUS XXII

Madras, 4-8 December, 1994

Sustainable Development and Regional Cooperation

THEME 1: BIODIVERSITY, GLOBAL WARMING AND SUSTAINABLE DEVELOPMENT

1. **Biodiversity and Peace on the Oceans**
M.S. Swaminathan.....
2. **The Warming of the Earth: The oceans and the forests: a positive feedback system?**
George M. Woodwell.....
3. **Some Thoughts on the Notion of Sustainable Development**
A. Vaidyanathan.....
4. **The Oceans and Sustainable Food Security in the Developing World**
Meryl Williams.....
5. **Sustainable Development of Living Marine Resources: A torrent of words and little action**
Sidney Holt.....

THEME 2: DEVELOPMENT AND COOPERATION IN THE INDIAN OCEAN REGION

6. **Institutional Cooperation in the Indian Ocean Region: Resource development and environmental protection**
Barbara Kwiatkowska.....
7. **Human Capacity Building and Technology Utilisation in the Indian Ocean Region**
Cyril Ponnampereuma.....
8. **Tourism and Sustainable Development**
Danielle de St. Jorre.....
9. **The Indian Ocean, its Economic, Technological and Social Characteristics: Strengthening of cooperation mechanisms**
S.K. Singh.....

THEME 3: SCIENCE AND TECHNOLOGY COOPERATION IN THE INDIAN OCEAN REGION

10. **Indian Ocean Centre for Research and Development in Marine Industrial Technology**
Krishan Saigal.....
11. **Ocean Science and Technology Cooperation for Development in the Indian Ocean Region: The Role of Intergovernmental**

Oceanographic Commission of UNESCO

- S.M. Haq.....
12. **The Concept of Business Development Centres in the Marine Industries Sector**
K. Venkataraman and L.K. Braute.....
13. **Feasibility Study on Mediterranean Centre for Research and Development in Marine Industrial Technology**
International Ocean Institute, Malta.....

THEME 4: RESTRUCTURING THE UNITED NATIONS

14. **The Law of the Sea Convention and Restructuring the United Nations System**
Elisabeth Mann Borgese.....
15. **The Reform of the United Nations System in the Context of The Law of the Sea and the United Nations Conference on Environment and Development**
Joseph Warioba.....
16. **Final Report of the Experts' Meeting on "The United Nations Second Generation"**
Foundation for International Studies.....

THE UN SECOND GENERATION - EXPERTS MEETING

Malta, 3-5 October, 1992

List of papersKEYNOTE PRESENTATION:

1. **"The Second Generation United Nations"**
Guido De Marco.....

THEME 1: GENERAL PROBLEMS OF UN RESTRUCTURING

2. **Geopolitical Dimension to Restructuring the United Nations**
M.M. Puri.....
3. **The Maltese Experience at the United Nations**
S. Borg.....
4. **The Constitutional Reform of the United Nations**
D. Archibughi.....

THEME 2: UN RESTRUCTURING AND OCEAN AFFAIRS

5. **Analysis of the UN Convention on the Law of the Sea**
E. Mann Borgese.....
6. **The Evolution and Potential of the International Seabed Authority**
D. Nelson.....
7. **Pacem in Maribus, UNCLOS and UNCED: Integrating Institutional Mechanisms for Ocean Governance**
P. Payoyo.....
8. **Agenda for Peace and Law of the Sea - Summary of Past IOI Work**
R. Huebert.....
9. **The Future of the Mediterranean: The Case for a Mediterranean Commission for Sustainable Development**
Salvino Busuttil

Workshop in Marine Technology Cooperation
in the Indian Ocean Region

List of papers

1. Working paper on possible options for technology cooperation in the Indian Ocean region
International Ocean Institute.....
2. A new cooperation for technology development in Latin America and the Caribbean: the Bolivar program
Jean-Francois Pulvenis.....
3. Feasibility study on Mediterranean Centre for research and development in marine industrial technology
International Ocean Institute.....
4. Report of workshop on marine industrial technology for the development of marine non-living resources
UNIDO.....
5. Case study on wave energy as a possible area of cooperation in the Indian Ocean region
V.S. Raju.....
6. Case study on spirulina as a possible area of cooperation in the Indian Ocean region
Muruguppa Chettiar Research Centre.....

A list of courses and publications of the
Foundation for International Studies and the
University of Malta

Courses

Diploma Course in Educational Planning and Management in Small States (in conjunction with the Commonwealth Secretariat): 9 January - 31 July 1995.

Publications

1. Islands and Small States: Issues and Policies in a special issue of World Development (An international journal published by Pergamon Press) Vol.21, No.2 (1993).
2. The Economic Development of Small Countries: Problems, Strategies and Policies published by Eburon Press, the Netherlands, (1989).
3. Sustainable Tourism in Islands and Small States, Volume 1: General Issues (forthcoming) Mansell Publishers, London.
4. Sustainable Tourism in Islands and Small States, Volume 2: Island Case Studies (forthcoming) Mansell Publishers, London.
5. The FIS publishes, together with UNESCO, INSULA, a journal on island affairs.

Publications in Progress

1. Island Economies: Models for Development Planning from the proceedings of a conference held in Mytilene, Greece.
2. Island Matters, Islands Matter from the proceedings of a conference held in Okinawa.
3. The EC Regional Policy with Special Interest to Islands from the proceedings of a conference held in Malta and organised by the Islands and Small States Institute.
4. Banking and Finance in Islands and Small States from the proceedings of the International Conference on Banking, Finance and offshore Activities in Islands and Small States which was held in Malta and organised by the Islands and Small States Institute.

A N N E X D



國際海洋學院中國業務中心

International Ocean
Institute

INTERNATIONAL OCEAN INSTITUTE
CHINA OPERATIONAL CENTER



10 June, 1995

Dr. Krishan Saigal
Executive Director
International Ocean Institute
Msida, Malta
Fax: 356 346 502

Dear Dr. Saigal,

According to your requirements, I organized the specific technicians of NMDIS to draft a proposal including eleven items which is enclosed. If they are inappropriate and not ample, please inform me by fax. I will modify and complement them.

I would express my sincere thanks for the hospitality and care you and your employees have shown me when I was in Malta.

Specially express my greeting and thanks for your wife.

With my best regard.

Sincerely yours

Hou Wenfeng
Director, IOI-China

RECEIVED/DEPARTED	REF.
ACTION: Dr SAIGAL	ACTION TAKEN
	95
INFO:	
FILE: World Commission	

List of the Items

- Item 1 Study on Effects of Relative Variation of Regional Sea Level on the Economic Development in the Coastal Zones and Islands**
- Item 2 Subjects to Be Studied in the Forward Marine Fields**
- Item 3 Tidal and Tidal Current Research and Analysis Prediction Service**
- Item 4 Establishment of the Marine Environmental DataBase and Data Product Service**
- Item 5 Construction of Buoy Monitoring and Forecasting System for Disasters in Sea-water Aquiculture**
- Item 6 Studies on the Strategy of Globalization of Marine High-Tech.**
- Item 7 Marine Development, Economic Information Exchange and Cooperative Study in the Countries and Regions around the South China Sea**
- Item 8 Marine Information On-line Query Service System for Countries and Regions around the South China Sea**
- Item 9 Training Course on Marine Information Retrieval and Automatic Library Technique**
- Item 10 Establishment of DataBase on United Nations Convention of the Law of the Sea (English) and Marine Rules and Regulations of all the Countries**
- Item 11 Study on Demonstration and Application of Monitoring and Management Information System of Sea Island Resources**

Item 1

Study on Effects of Relative Variation of Regional Sea Level on the Economic Development in the Coastal Zones and Islands and the Defense Strategy

I. Background

With the increase of the density of the greenhouse atmosphere, the global climate warm results in the raise of the global sea level. The tendency of the raise of some sea level comes into being. Many international organizations (such as IGBP, IPCC, IOC, UNESCO, etc.) and international conferences (such as the UNCED, etc.) list the sea level raise in the important study subjects in the marine country in the future.

The regional difference of the interaction of the atmosphere, the ocean and the land causes the malconformation of the variation of the regional sea level.

There is the corresponding defense strategy for the inevitable raise of the sea level.

II. Content

1. Study on the regional characteristics of the sea level raise;
2. Prediction of the regional sea level raise;
3. Scale of the relative raise of the regional sea level;
4. Study on the erosion of the relative raise of the sea level to the land and the coastline variation;
5. Effects of the sea level raise on the warning water line of the storm tide;
6. Study on the control of the atectonic subsidence of the land;
7. Effects of the relative variation of the regional sea level on the native economic development.
8. Study on the strategy of adapting to the relative variation of the sea level.

III. Experience and Competence

We have been engaged in the sea level research for almost ten years. Many professors and assistant professors have been involved in this research field. The projects we have finished or are doing are:

1. Monitoring and study of the variation of the Chinese coastal sea level;
2. Effects of the climate variation on the Chinese coastal sea level and the study on the adapting strategy;

Item 3

Tidal and Tidal Current Research and Analysis Prediction Service

I. Dynamic Numerical Model

1. Two-dimensional numerical model of the tidal wave (including the plane right-angle coordinate and ball coordinate) which is used for the computation of the water level field and current field in some sea area.

2. Three-dimensional model of water dynamics with coordinate of X-direction extension

If a deep-sea channel or a breakwater will be constructed in some sea area, the variation of the dynamic conditions of the water level, current field, silt motion and pollution proliferation should be understood. It is required that the net is very small at the channel or the breakwater, so the computation volume is very large. This model can short the computation time to one-tenth to one-dozens.

3. Water-dynamic three-dimensional model under coordinate.

Generally, the water depth of the inshore shallow water has great difference with that of other sea area. The water depth for the layer division is different largely. The resolution is rather low in the shallow sea area. After the vertical direction is converted by the coordinate, the water depth of each layer is same. So the computation accuracy is increased and the mathematic processing is easy to do.

4. Numerical model of the storm tide and the joint numerical model of the storm tide and astronomical tide

The two models are used for the numerical simulation of increased water by typhoon. The joint model can include the nonlinear coupling effect of the astronomical tide and increased water by typhoon. It can compute the astronomical water level and the real water level including the increased water.

II. Tidal Current Analysis and Prediction and Computation of the Parameters of Various Tidal Current

1. Harmonic analysis of the sea current data obtained in the survey

It is used for the computation of the harmonic constants of the tidal current, elliptic element, after current, etc..

2. Nonharmonic constants and characteristic parameter of the various kinds of tidal current required by the engineering.

3. Prediction of the tidal current

It includes the permanent prediction, the half-day tidal current chart predication, prediction of the extreme value of the go-and-return tidal current and the rotating tidal current, hour-by-hour prediction, etc..

III. Management, Processing and Service of Tidal Data

1. Standardization of the tidal data;
2. Quality control of the tidal data;
3. Analysis and prediction of the tidal data;
4. Analysis and computation of the tidal characteristic value;
5. Analysis and computation of the tidal level parameters in the harbor engineering;
6. Storm tide prediction.

Item 4

Establishment of the Marine Environmental DataBase and Data Product Service

I. Background

With the development of the marine science and technology, the increasing of the scale of the marine survey and the improvement of the survey equipment and method, the marine data volume is increasing in a large amount. How to process a large amount of the marine data quickly so as to increase the data use and share the data is the common problem faced by some developing countries. The marine databases of various marine subjects established by use of the advanced computer technique are able to fully utilize these marine data to develop a variety of data products and provide the services. The National Marine Data and Information Service (NMDIS) is willing to provide the technical support and services for the developing countries in the fields of the quality control of the data processing, database establishment and development of the data products.

II. Basic Conditions

The NMDIS has the advanced computer hardware and software (server, workstation, high accurate plotter, ORACLE database management system, powerful plotting software system, etc.) and the specialists in the data processing, database establishment, etc.

Item 5

Construction of Buoy Monitoring and Forecasting System for Disasters in Sea-water Aquiculture

I. Background

The sea-water aquiculture is paid more and more attention to by the coastal countries because of the decrease of the catch in the world oceans. However, the complex and variation of the environment of the sea-water aquiculture, the day-by-day serious marine pollution, the increase of the nutrient-rich degree of the water body, the frequent occurrence of the red tide and so on result in the mass death of the sea-water aquicultured organisms all over the world in recent dozen of years, which produces the disastrous effects on the developing sea-water aquiculture industry and causes a great economic loss.

The buoy monitoring and forecasting system for disasters in sea-water aquiculture is significant to prevent and decrease the loss caused by the disasters, to maintain the ecological balance in the oceans and to utilize sustainable the marine resources.

II Basic Conditions

China has done much work in the field of red tide monitoring and the National Marine Data and Information Service (NMDIS) has also done much work in monitoring the sea-water aquiculture environment by use of the temperature-measured chain buoy. However, it still does not meet the demands in the increasing development of the sea-water aquiculture industry. It needs the international cooperation (such as the cooperation with Japan, Norway, etc.) to establish the automated buoy observation system for the disasters in sea-water aquiculture (selecting a small aquiculture area). After the establishment of the system, China is willing to provide technical service for or cooperate with the developing countries.

Item 6

Studies on the Strategy of Globalization of Marine High-Tech.

Marine high-tech is the supporting basis of the marine economy. Since the publication of the United Nations Convention on the Law of the Sea, the industry cluster of marine high-tech has been formed with main guidance of the development technology of the offshore oil resources in the world marine economy. As the coastal developing countries concerned, the global trend of the marine high-tech is not only the challenge, but also an opportunity for the development of the native marine economy. It is possible that the financial problem in the development of the marine economy is solved by means of the international flowing money capital in the process of globalization of the marine high-tech on the one hand, and the native marine high-tech industry is developed on the other hand. The marine sovereignty and marine resources can be protected in an effective way, and the national economy and the people's living standard increased. The purpose of the study is to develop the models of the marine economy for the coastal developing countries. The main ideas are as follows:

1. impacts of the international industrialization of the marine high-tech;
2. Position of the technology of maintaining the marine environment in the sustainable utilization of the marine resources;
3. Strategy of using the foreign capital to develop marine high-tech and economy in the coastal developing countries;
4. Recommendation on the development of the marine economy of the coastal developing countries.

Item 7

Marine Development, Economic Information Exchange and Cooperative Study in the Countries and Regions around the South China Sea

Objectives:

Explore the possibility of establishing the marine development and economic information network in this region and develop the

regional exchange and cooperation of the marine economic information

Study subjects:

- 1. Survey of the current situation of the marine development and economic information system in the countries (or regions) of this area;**
- 2. Analysis of the possibility of establishing the regional marine development and economic information network;**
- 3. Detail proposal of developing the marine exploitation and the exchange and cooperation of the economic information in this area.**

Item 8**Marine Information On-line Query Service System
for Countries and Regions around the South China Sea**

In order to facilitate the marine development and sustainable development in the countries and regions around the South China Sea, the regional marine information on-line query and service system should be set up to realize the marine information sharing. The National Marine Data and Information (NMDIS) has set up several marine information databases since the 1980s and gathered the experts and experience for the set-up of the database of this kind. The system which will be set up can first provide on-line and networking service for the countries and regions around the South China Sea, and then the Western Pacific network will be established to provide on-line query service. The whole project will be complete in three years.

Item 9**Training Course on Marine Information Retrieval
and Automatic Library Technique**

In order to adapt to the global marine development and sustainable development and ensure the high effective service of the marine information, the computerized management of the marine information resources has become the urgent task for most of the developing countries. The National Marine Data and Information (NMDIS) has held the training courses of this kinds. The personnel and experience are competent to undertake such training course. It can be held once every two years and each course is 10 to 15 persons.

Item 10

Establishment of DataBase on United Nations Convention of the Law of the Sea (English) and Marine Rules and Regulations of all the Countries

Objective

Provide the series of data in floppy on the United Nations Convention of the Law of the Sea and the document of the marine rules, regulations and laws so as to directly serve the international organizations and all the countries to act according to law and to provide service to the study on the UNCLS.

Content

The database includes three subdatabase:

1. Database of UNCLS and the marine rules, regulations and laws made by the international organizations;
2. Database of the marine rules, regulations and laws made by all the marine countries in the world;
3. Database of the agreements and protocols.

(It is considered to set up the different databases according to the different subjects.)

Conditions possessed by NMDIS

1. Hold part of the materials of the international marine rules, regulations and laws and have the collection channels;
2. Have specialists on the marine laws and technical English

Item 11

Study on Demonstration and Application of Monitoring and Management Information System of Sea Island Resources

The objective of this project is to establish the sea island resource information system by use of the remote-sensing and GIS (Geographic Information System) techniques and the comprehensive survey information on the sea islands. This system consists of the data and information collection, graphic and image processing and analysis, time-space database, application

model analysis and the information products. The representative island is selected to set up the demonstration system of the sea island resource dynamic monitoring and comprehensive management and service and to carry out the corresponding application study so as to provide scientific basis and effective method for the sustainable utilization and protection of the sea island resources. The system can provide technical support and experience for the developing countries and the island countries.

The NMDIS possesses various types of computers and related softwares. There also are a lot of technicians such as professor, assistant professor engaged in this project. We hope to cooperate with the developing countries and island countries to buy some of the satellite and aerial remote-sensing data and the practical survey data according to the study target to complete this project.

A N N E X E

**STATE OF THE ART
ON
OCEAN ENGINEERING, TECHNOLOGY AND MANAGEMENT
FOR THE UTILIZATION OF THE OCEAN RESOURCES
BY
PROF.M.R. PRANESH
PROFESSOR & HEAD
OCEAN ENGINEERING CENTRE**

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STATE OF THE ART
ON
OCEAN ENGINEERING, TECHNOLOGY AND MANAGEMENT
FOR THE UTILIZATION OF THE OCEAN RESOURCES

by

Prof. M.R. PRANESH

Professor & Head

Ocean Engineering Centre, IIT, Madras, India

EXTENDED ABSTRACT

1. GENERAL

National frontiers are extended by 320 km into the ocean, as a result of the new Law of the seas. Consequently the command area under control of the respective nation is enormously increased to a higher percentage. Hence, minerals, energy, food etc. have therefore become available abundantly from the oceans. To explore and exploit these, living and non-living resources, ocean provides a great opportunity and challenges to scientists, engineers as well as technologists.

2. GEOGRAPHICAL AREAS OF THE OCEANS

The geographical areas that ocean possess can be redefined in a following manner.

- 1) Americas (North and Latin America)
- 2) Central Europe (Austria, Belgium, Netherlands, U.K.)
- 3) East Asia (China, Korea, Malaysia)
- 4) Northern Europe (Denmark, Finland, Norway, Poland, Russia, Sweden)
- 5) Pacific Islands (Japan, Indonesia, India)
- 6) South Europe (Bulgaria, Croatia, France, Greece, Italy, Rumania, Spain, Turkey)

These countries are centered by various oceans like the Mediterranean, Indian Ocean, Bay of Bengal, Arabian sea, Black sea and so on. The oceans and their interacting seas form a continuous territory that covers about 3/4ths of the earth's surface.

3. OCEAN RESOURCES AND TECHNOLOGY

Within these liquid expanses, there are minerals inexhaustible living and non-living resources. Even the continental shelf of world's ocean, that is, the area of 200 mtrs. or less from the shore line, is greater in area than that of moon. This offers almost virgin territory who would

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seek to explore it. The exploration and exploitation of ocean resources require a tremendous amount of high technology and initial investment in money and skills. The main development of such exploration programme demands proper understanding of the ocean. This effort can offer periodically opportunities for significant break-through in the nations economy if integrated systems approach for oceans resource exploitation is adopted for sustainability.

4. LIVING RESOURCES

The biological features of the sea consist mainly of 10,000 non-species of one called plants called hytoplanktons that support all marine life. The major focus of ocean activity today tends to lie in mankinds research for energy as well as food. The sea can never satisfy the total food requirements of a very large sector of the human population but it is an excellent source for a most critical element of the human diet, viz., animal protein. The success of the oceanic fishing depends on how well it is possible to determine the location of fish shoals and on the level of sophistication of available ocean technology. Locating, tracking and identifying fish sources involve the following major steps:

- 1) Locating and identifying the exact position of the fish
- 2) Searching for the general ocean area in which commercial concentration are to be expected. In most advanced countries, the long range search involves mapping with heavy dependence on environmental information. Seawater itself is an excellent sources and soluble minerals like salt, potassium, magnesium and bromine. Every cubic kilometer of ocean water consists of about 40 million tonnes of dissolved solids.

5. MINERAL RESOURCES

The marine resources such as petroleum, sand, gravel, desalinated water, phosphate, manganese nodules placer deposit fish, fish protein concentration, aqua cultura etc., is being exploited with the available technology throughout the world. A proper consideration of marine resources will begin with an understanding of the characteristic features of deep ocean. The physiographic features of the ocean consist mainly of continental shelf extending from beach to distance 1300 km with outer depths of 50 to 500 metres. The continental slope slanting downwards from the shelf to the ocean depths of 3 to 5 km at a slope of 5 deg. A deep abyssal plains consisting of flat land beyond the slope.

The exploitable mineral deposits are probably from the sediment chemically formed materials at or near surface such as, ferro manganese nodules. Production operations for the mining of submarine deposits of tin, diamond, gold and iron in various arts of the world ocean are very well known. However, it is widely known that near shore sub-marine deposits of sand and gravel are becoming sources of construction materials. Along

Indian coasts, heavy mineral rich beach sands, containing monazite and ilmenite have been found. The ferro-magnese nodules of 2.5 cm size with appreciable quantities of nickel and cobalt have sampled from various locations in different parts of the Indian Ocean. The offshore occurrence of calcareous deposit suitable for the consumption in the industry have been reported from water samples off Andaman, Nicobar and Lakshadweep islands. These deposits which represents the remains of calcareous organism such as coral are also expected to occur in many more areas around the Indian peninsula. The chromite has been found in the sea floor rifts in the Indian Ocean. Efforts to survey the extent of these sources have however been few. This is mainly because of the absence of technological capabilities.

6. DESALINATION FROM SEAS

The development of large scale desalination of sea water system with the use of nuclear power is also progressing rapidly in the world scenario. The development of this technology may become important for the larger Indian urban centers near the sea. The greatest potential success for the generation of energy from the sea are 1) the materials for atomic fission. It has been estimated that the thorium and uranium in the world ocean would supply the power requirement for billion with a percapita requirements of 5 kw hour per day for some 700,000 years. The deuterium and hydrogen could supply future power for a period of 4 times greater than age of the solar system. The ocean today is used as an excellent source of cooling water for absorbing waste heat.

7. OCEAN ENGINEERING AND TECHNOLOGY FOR OIL EXPLORATION (NON-LIVING RESOURCE)

About 16% of the 87 million barrels per day of oil produced in the world comes from the sea. Mainly from Gulf of Persia (Arab Countries) Mexico, North sea and off the Indian coast. It is estimated that about 20% of the world's oil resources lie under the seabed. But these resources are yet to be exploited. As fuel shortage compels the world to look for new sources of energy, efforts to tap ocean oil are to be intensified. The problem faced in oil exploration and production is inadequacies in ocean technology. It is far more complicated than that on land. Indeed some of the engineering problems in these areas are yet to be solved. Exploring for oil is risky business. It is the presence of water makes the problem far more complex and costly. Hence large scale development is very much essential on Ocean Engineering and technology for exploration of non-living resources apart from sophisticated technology required for living resources exploitation.

In the foregoing section emphasize will be made with respect to exploration and exploitation of non-living resources from the ocean.

8. OCEAN STRUCTURAL SYSTEM FOR EXPLOITATION

Ocean Structural System comprises of three major sub-system:

- 1) The super structure above the sea bed
- 2) The structures above the mean sea level
- 3) The structures below the sea bed or sub-structure (foundations)
- 4) Appurtenant structure

These different sub-systems will be subjected to various types of environmental loading considerations. Hence the hydrodynamic force that is acting in a given location as well as the sea bed characteristics places the major role in the design of Ocean structural system in integral manner. The evaluation of wind, wave, ocean current may require the use of statistical techniques. The problem of interaction in the design of sub-structural systems mainly involves the evaluation of sea floor engineering characteristics. The sub-surface exploration requires mobilization of vessels, navigational aids, sparker, boomers, soil testing rigs and other related equipments. For the determination sea floor engineering characteristics, two general techniques are adopted, 1) undisturbed samples of soils are taken and tested in the laboratory. (In the same way as done in onshore soil testing).

In the case of offshore testing, problem arise due to the fact that it is difficult to obtain an undisturbed core when there is an intervening layer of sea water. 2) In situ testing of sea bed soils by suitable modification of the existing instruments to operate underwater. The classical wave theories employed to compute flow characteristics and wave profiles assume that waves in nature can be represented by a series of well defined periodically occurring sinusoidal or trochoidal wave forms. Characterising the sea as a random process requires far more data that are yet available for general acceptance.

9. TYPES OF OFF SHORE STRUCTURES AND DESIGN

The off shore structures may be of either steel or concrete. With the growth of the offshore industry, a large variety of systems have been pioneered. Fixed platform in steel tend to follow one of the following 3 basic types namely a) template - type structure b) monopod structure and c) concrete gravity structure. The design of these types of offshore structure is a complex complicated process. They have to withstand an environment that has to be predicted only with uncertainty. Also must rest on seabed whose properties and behaviour are random. Nevertheless the actual calculations and design of a structure have reached the high degree of sophistication due to computer era. First step in this process must be an evaluating of the environmental forces that structure has to withstand during its life time. In addition to the wave load the structure has to withstand current load, earthquake load, operation and other environmental loads. The structure must be safe against fatigue considerations.

10. MARITIME STRUCTURES (PORTS, HARBOURS AND TERMINALS)

Maritime trade is in operations since dawn of civilization. These ports for the success of maritime trade must have necessary handling facilities. These facilities are to be provided in a water depth not ranging beyond 35 metres. The different types of structural system like break water, storage facilities, Fending system, handling system, dredging system are to be provided. These different systems also be subjected to various types environment loading considerations. In some situations they may be subjected to extreme condition like cyclonic activity which may result in failure of structure and related installation. There is partially little precisions in maritime work. There is probably no other branch of engineering in which experience and judgment play an important role in the design. In view of the many variable natural factors involving in harbour design, and manner in which they contribute for forces, model studies offer an efficient solution. But model designing is extremely complex and hence results are to be interpreted with caution. This is especially true because of scale effects.

In recent years, a new kind of port loading, unloading facilities namely offshore terminal has come to practice. These offshores terminals play an important roles in handling and transportation of crude oil, petroleum oil and other liquid cargos.

11. DESIGN OF OCEAN STRUCTURES

It is possible to design and and operate the various ocean installations when once the environmental parameters are determined. There are different types of installations a) production and drilling platforms b) light houses c) terminals d) sub-sea pipelines etc., All of these ocean structures need the same basic environmental data based on their locations.

12. DESIGN OF PIPELINES

Design of submarine pipeline requires a complex analysis. The pipelines may vary from 0.1 m to 1.5 m dia depending on purpose namely carrying crude oil, oil products, gas, electrical ducts. They have to be designed for long term stability when they lie on the sea bed subjected to current forces. They must be designed for both under dynamic and static condition. The major stress that the pipeline experiences, is during installation. All the installation methods namely lay barge techniques, floating with pontoons, pulling with winch, require careful planning. This is to ensure that the pipe is neither over stressed nor becomes unstable due to being too light weight. Submarine pipeline may connect offshore production platform directly to shore based refineries. But in initial stages offshore terminal may require to moor the tankers at sea or shore during the loading or unloading the crude oil. These terminals are broadly of three types a) the sea island b) multi buoy mooring system and c) single buoy mooring system.

13. CHALLENGES FOR OFF SHORE OIL EXPLORATION AND PRODUCTION

Working in off-shore exploration is highly complex due to the interaction of environment as well as the water depths. The environment, namely the waves, ocean currents, winds at sea and sea bed below the water is not known with considerable degree of accuracy. These environmental factors affect off shore platforms submarine pipelines, and terminals during installation and maintenance stages as well as corrosion protection measures. The first fundamental step involved in ocean engineering and technology is the collection and analysis of all available environmental data. This will define the operating and maintenance parameter for all engineering structures in the ocean. This data must be synthesised from meteorological, oceanographical and sea floor engineering before any offshore structure for particular location can be designed, operated, maintained and managed.

14. ENERGY FROM THE SEA

Ocean serves is a major sources of energy exploitation. The different types of energy that can be harnessed are 1) wave energy 2) tidal energy 3) thermal energy conversion 4) salinity gradients and 5) the ocean currents.

The ocean being exploited for various types of energy, globally pilot plants have been installed at some locations and functioning satisfactorily.

Waves energy pilot plant has been commissioned along the Trivandrum coast, India in the Arabian sea. This was designed and installed with a capacity of 150 Kw. The depth of the weather in which it is functioning is about 10 m. The concrete caisson has been used as a ocean structure for the extraction of the energy. The pilot plant is proved the capability of harnessing wave energy. Hence a mega plant (proposed capacity 150 MW) is being designed which is to be commissioned in the Trivandrum Coast, India shortly. The tidal plant at Gujarat Coast, India is also working in satisfactory manner.

15. OCEAN MINING

Shallow water and deep water mining is to be adopted for exploitation of placer deposits, as well as manganese nodules. The technology required at these situations (shallow, deep) are different. Presently the technology is available for shallow water mining.

16. OIL POLLUTION AND WASTE DISPOSAL

The major problem involved in the utilization of Ocean resources is the oil pollution and waste disposal. Heavy magnitude of oil is discharged into the sea by navigational ship as well as the spills from the oil wells. In addition Ocean is being used as a sink for the disposal of waste of different kinds (the radio active industrial and human waste). The ocean now acts like a source for the resources exploitation

and a sink for the disposal of waste. This dual role of the ocean will be creating environmental impact on the living resources as well as on the coastal line. The disposed wastes and the oil slicks may create a global climatic changes. The ocean pollution with oil can be identified as hot spot which causes concern to the adjoining habitants on the shore. Sometimes these hot spots may be within 5 to 6 kms from the coastline indicating that the problem has not spread to outer seas. The pockets where the pollution levels are alarming are mainly near industrial and urban discharge areas. Depending upon the location of the waste disposal the sea water contents organic wastes, hydrocarbon as well as trace element, soda ash and other chemicals. The gas that is coming out from the exploration well has either to be dehydrated and transported to the shore through pipeline or flared. Flaring require the design of additional structure at a sufficient distance from the main production platform. To dispose of to the water and the sand containing oil, special treatment methods are to be employed.

17. VESSELS AND NAVIGATION

working at sea requires a suitable and an accurate navigation system. Wide range of vessels now ply the seas running from one million ton oil tanker to water skimming hydrofoils. A number of navigation system are in use. Their refinements in accuracy and range depends on the user's requirements.

18. IMPACT OF OCEAN STRUCTURES ON COASTAL LINE

The various man made structures like port , coastal and ocean structures would be creating ecological imbalance. This in turn makes an impact on the coastal line resulting in erosion and accretion. For the exploitation of the ocean resources construction of different types of ocean structures are essential but at the same time this will also create sufficient amount of environmental impact. Hence ocean structure-shore line interaction is a major thrust of study of sustainability of mankind for years to come.

The different types of ocean structure interact with different environmental forces resulting in marine corrosion. Some of the corroded products will be mixed to the sea water. This in turn will endanger the living resources. Hence any type of activity that is attempted in the ocean for the sustainability will in turn may damage the coast line as well as living resources. The environment impact due to ocean utilization is to be minimum on a) coastal zone b) as to well as living resources.

19. MANAGEMENT AND LOGISTICS FOR DESIGN

Planning and operation of ocean structure is complicated. This is due to uncertainties involved in oceanography and meteorological conditions. Hence a risk analysis is to be conducted for the design and operation of different types of

ocean structural systems. Hence the multi-disciplinary project team must study 1) Ocean hydrodynamics 2) Sea floor Engineering characteristics 3) selection of materials for the environment 4) development of static and dynamic stability of the integrated platform, 5) sea bed pipeline interaction, 6) pipeline platform interaction etc., systematically.

The above paragraphs highlights some of the engineering problems involved in working on the continual shelf for oil production of shore. There are a large number of unsolved problems which need site based solution.

20. MARINE CORROSION AND BIOFOULING

Ocean structure will be subjected to severe corrosion problems. To prevent the corrosion of steel in offshore installation, it is normally divided into three zones namely 1) Marine atmospheric 2) Splash and 3) submerged zones. Biofouling is due to presence living organisms in sea. Necessary protection design are to be designed against corrosion and Biofouling for all types of ocean structures and sea going vessels.

21. TECHNOLOGY AUGMENTATION

In the above paragraphs a spectrum of structures that are required for the ocean explorations for the sustainability of the mankind through oceans in future has been highlighted. These are engineered structures demanding a high accuracy in involvement of the environmental parameters. So to evolve these parameters, a number of institutions (educational research organisations) have been established globally. Each institute specializes in a specific activity of the ocean exploitation. Some of the institutions that are prominent in India dealing with Ocean Engineering are given below.

A) Education Institutions:

- 1) Ocean Engineering Centre, IIT, Madras
- 2) Dept. of Civil Engineering, IIT, Bombay
- 3) Dept. of Naval Architecture, IIT, Kharagpur
- 4) IIT, Delhi
- 5) Dept. of Applied Mechanics, KREC, Suratkal, Karnataka
- 6) REC, Calicut, Kerala
- 7) Andhra University, A.P.
- 8) Cochin University, Kerala
- 9) Institute of Ocean Management, Anna University, Madras

B) R & D Institutions:

- 1) Central Water Power and Research Station, Pune, Maharashtra
- 2) National Institute Oceanography, Goa
- 3) Central Electro Chemical Research Institute, Karikudi, Tamil Nadu

These institutions have got sufficient facilities for carrying out experiments/model studies related to ocean and coastal engineering problems.

22. ACADEMIC PROGRAMS

The Ocean Engineering Centre, IIT, Madras offers M.Tech, M.S. and Ph.D programs in Ocean Engineering and B.Tech. program in Naval Architecture. An user oriented M.Tech program in Ocean Engineering is also being offered for engineers from various ports. Other institutions are also offering programmes related to ocean utilisation.

23. THE OVERLAP AND PROBABLE EXPANSION OF EXISTING DISCIPLINES INTO OCEAN ENGINEERING PROBLEMS

Fig.1 shows various inter disciplinary problems that are to be incorporated in analyzing the Ocean Engineering problems. The IIT Madras has capabilities in all major disciplines, viz. Mechanical Engineering, Civil Engineering, Naval Architecture and Management.

24. CONCLUSION:

Ocean Engineering and Technology is a complex inter disciplinary area. This high technology thrust area is essential for the utilisation of ocean resources for the sustainability of the human race. The technology is variant with respect to water depths. The synthesising of the environmental parameters and data bank for various oceans is essential. Host of ocean structural systems are to be designed, installed, operated and mainted for the exploitation of the oceans. The importance of Ocean Management and logistics is to be integrated with the design of ocean structural systems.

APPENDIX 1

ABOUT OCEAN ENGINEERING CENTRE, IIT, MADRAS

Ocean Engineering Centre at IIT Madras was established by the then Ministry of Education, Government of India in 1977 with the following objectives:

- a. To create infrastructure and expertise to carry out R & D work in the area of Ocean Engineering.
- b. To create educational and research opportunities at graduate and doctoral levels.
- c. To collaborate with user organizations as resource Centre for consultancy, sponsored research and manpower development.

The Centre has achieved its objective in creating unique facilities in Ocean Engineering to carry out teaching, research and consultancy of high quality. It has a laboratory area of about 3,000 m² and a highly specialized faculty numbering 24 with adequate support from technical, scientific and administrative staff.

MAJOR FIELDS OF RESEARCH & TEACHING

1. Structural Analysis, Design and Testing
2. Wave Hydrodynamics
3. Ship, Floating Platforms and Submerged Bodies
4. Marine Geotechniques
5. Materials in Marine Environment
6. Ocean energy

EXPERIMENTAL FACILITIES

Infrastructural facilities for carrying out R & D and teaching in the area of Ocean Engineering are:

A) HYDRODYNAMICS

1. Wave basin, 30 m x 30 m x 35 m (fitted with lates)
2. Long crested Wave Maker & 52 element Multi element wave maker
3. 4 m wide & 70 m long flume with wave maker
4. 2 m wide & 100 m long flume with wave maker (for shallow waters)
5. 2 m wide flume with wave maker & current generation facility
6. 100 m long Towing tank

B) OFFSHORE STRUCTURES & CONCRETE LABORATORY

C) MARINE MATERIALS LABORATORY

D) MARINE GEOTECHNICAL LABORATORY

E) COMPUTATIONAL FACILITIES

F) INSTRUMENTATION'S LABORATORY

G) MODEL MAKING LABORATORY

Hydrodynamic Testing facilities are unique in nature in South-East Asian Region.

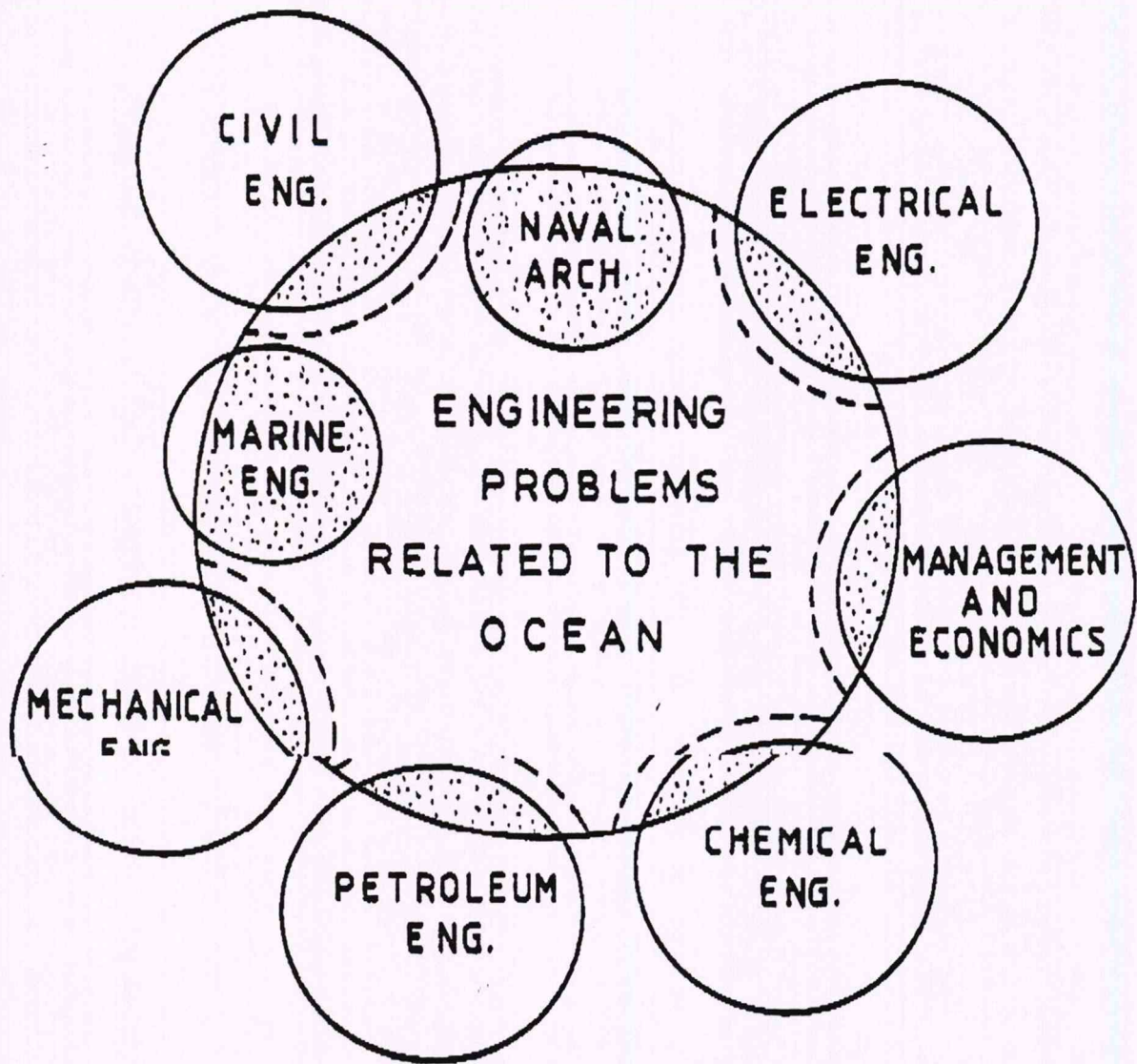


FIG.1. OVERLAP AND PROBABLE EXPANSION
OF EXISTING DISCIPLINES INTO OCEAN
ENGINEERING AND MANAGEMENT

A N N E X F

INDEPENDENT COMMISSION ON THE OCEANS

PROPOSAL

Endangered Habitats Coral Reefs, Mangroves and Seagrasses

Sponsored by the East-West Center
and
The Pacific Science Association

in collaboration with
The International Ocean Institute
Operational Centre at
The University of the South Pacific
Suva, Republic of Fiji

With the coming into force of the United Nations Law of the Sea in November 1994, and with the provisions required by UNCED, Agenda 21, Chapter 17, coastal nations are faced with enormous challenges in the management of sustainable development of their coastal resources. In the developing world, coral reefs, mangroves and seagrass ecosystems are among the world's endangered habitats.

Under this proposal a chapter on these endangered habitats will be prepared: the chapter will be global in scope, and will provide a state-of-the-art review of coral reefs, mangroves and seagrass habitats, followed by detailed recommendations for their protection and sustainable development, and an Action Plan. The world's experts on these habitats will contribute to compilation of the chapter.

The chapter will have the following proposed outline:

1. Introduction/ organization, including definitions and regional assessments.
2. Distribution and abundance of reefs, including biogeography and biodiversity.
3. Values and functions, including traditional aspects.
4. Ownership and custody of reefs.
5. Threats to reefs - natural and anthropogenic.
6. Status (by region)
 - State of knowledge:
 - Stressed reefs - recovering and undisturbed: healthy.
7. Recommendations
 - Assessment
 - Monitoring
 - Other research
 - Protected areas
 - Integrated coastal zone management
 - Community-based management
 - ~~Community-based management~~
 - Information resources management

- Global cooperation/climate change
 - Education and training
 - Legal aspects
8. Action Plan for coral reef ecosystems.
 9. Key references.
 10. Appendices. including maps. diagrams and figures.

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