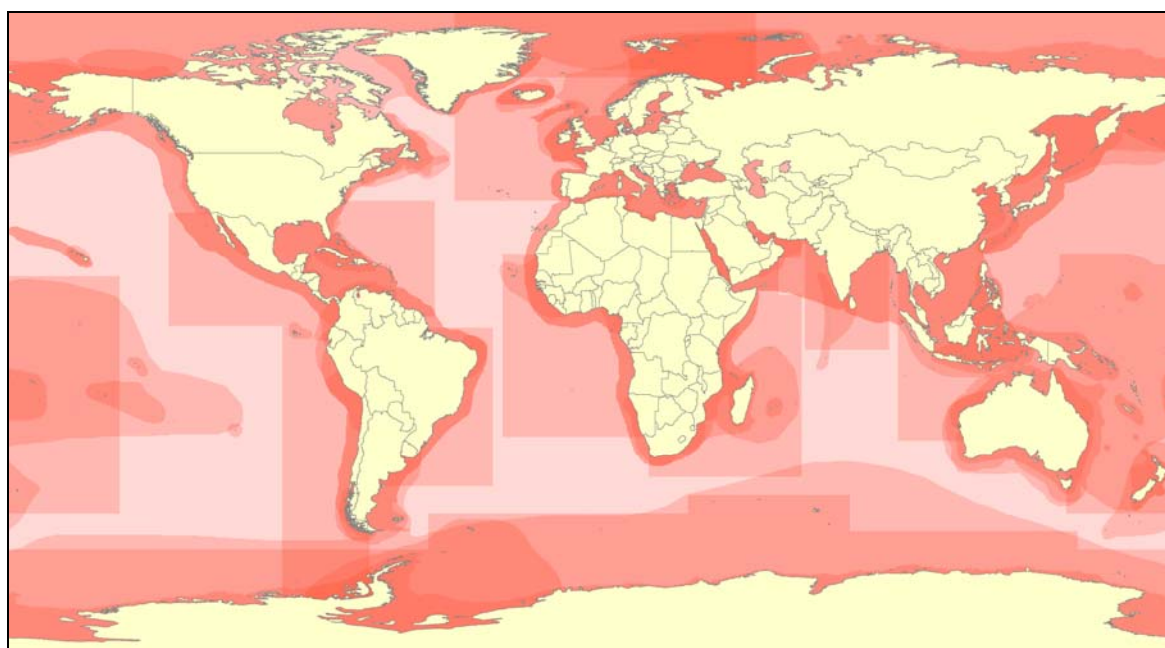


A SURVEY OF GLOBAL AND REGIONAL MARINE ENVIRONMENTAL ASSESSMENTS AND RELATED SCIENTIFIC ACTIVITIES



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NOTE

The views presented in this report are those of the author and do not necessarily reflect those of the sponsoring organisations.

The recommendations presented here are based on the information received from regional and global organizations, in particular the analysis of the returns of completed questionnaires. In the scope of this study it was not possible to validate further information on marine assessments and related scientific activities given in literature and on the Internet

Due to the large number of assessments reviewed, it was not possible to refer to and acknowledge individually all of the excellent work that is being currently carried out at a regional and global level.

EXECUTIVE SUMMARY

As part of the implementation of UNEP Governing Council Decision 21/13 on a Global Assessment of the State of the Marine Environment, this study was commissioned to analyse information on marine environmental assessments carried out at the regional and global level.

The objective of the review is to contribute to the establishment of a Global Marine Assessment (GMA), a regular report on the state of the marine environment, supported by the UN. It aims to provide a snapshot of the current situation and answer the following questions:

1. In which ways could a GMA process integrate existing and planned assessments?
2. How could identified thematic and geographical gaps be addressed and filled?

Data was generated through the distribution of questionnaires. Analysis of the information returned concludes that existing assessments are not sufficiently regular or sustainable to achieve the expectations of the proposed GMA mechanism. Based on the present review, it is recommended that:

1. To be sustainable, a GMA must have the support of national stakeholders and use, where possible, the support of existing regional agreements, frameworks and organizations.
2. For those marine areas or marine environmental issues which currently are not, or are insufficiently, covered by assessments, a GMA will be required to support existing capacities and develop new capacities, in particular for the assessment of:
 - (i) the high seas and deep / open waters;
 - (ii) the marine environments of developing nations and SIDS;
 - (iii) the interactions between marine and freshwater systems.
3. A GMA should endeavor to use primary data where it is available. This information should be subject to internationally accepted standards and quality assurance measures to ensure credibility.
4. The planning, implementation and review of a GMA should involve representatives from existing assessments to avoid duplication and to learn from their experience.
5. A GMA mechanism must ensure the involvement and ownership of the process by the end-user, in particular national and regional policy makers so it will be flexible enough to meet their changing needs.
6. A GMA should involve the private sector, as well as industrial and environmental NGOs, as stakeholders in the assessment process. These sectors could provide a useful source of information and also help to raise awareness and increase responsibility for the marine environment.
7. A GMA mechanism must recognize the differences in national and regional approaches, capacities, resources and constraints for collaboration and incorporate these into its design.
8. A GMA mechanism should use existing regional capacity where it exists, and facilitate the transfer of skills, the development of training and the building of capacity in geographical and thematic areas where it is lacking.
9. In addition to its primary role of regularly reporting on the status of the marine environment, a GMA has the potential to:
 - (i) serve a role as facilitator to encourage the sharing of information and experiences, and to promote collaboration between regions and disciplines, thereby improving international networks for issues relating to assessment of the marine environment;
 - (ii) provide an advisory role for existing assessments, spreading methods of best practice and developing standardized methods for data collection, quality assurance and assessment.
10. A GMA should aim to streamline existing international activities concerning the assessment of the state of the marine environment and contribute to the increased collaboration between UN agencies.

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1. INTRODUCTION

1.1 Preamble¹

This study has been conducted in response to the UNEP Governing Council Decision 21/13 on a “Global assessment of the state of the marine environment” (Annex 3), which requests the Executive Director of UNEP, “*in co-operation with UNESCO-IOC and other UN agencies, the CBD Secretariat, and the Regional Seas Programmes to explore the feasibility of establishing a regular process for the assessment of the state of the marine environment, with active involvement of governments and regional agreements, building on on-going assessment programmes*”. Implementation of the UNEP GC Decision 21/13 has led to the concept of a Global Marine Assessment mechanism by the international community, as demonstrated by the commitment made by governments at the World Summit for Sustainable Development, South Africa, September 2002.

The study was executed by UNEP-WCMC in collaboration with UNESCO-IOC and supported by UNEP and the National Governments of Iceland, Germany and the UK in response to the outcomes of the Bremen meeting (UNEP, 2001). The objective of this study is to contribute to the establishment of a regular process, with the support of the United Nations, for a global reporting and assessment of the state of the marine environment (Annex 1, working definitions). It is to serve as a factual basis to complement the recommendations of two international meetings held in Reykjavik and Bremen with respect to the feasibility, development and implementation of a GMA. It aims to provide a snapshot of current marine assessments and provide reliable answers to the following questions:

1. In which ways could a GMA process integrate existing and foreseen assessments?
2. How could identified thematic and geographical gaps be addressed and filled?

The report presents information resulting from the analysis of 82 existing and future marine environmental assessments and related scientific activities carried out at the regional and global level under relevant organizations or conventions. The report considers the marine environment to include estuaries, coastal regions, continental shelves and open oceans. A more detailed background to the implementation of UNEP GC Decision 21/13 is presented in Annex 4.

1.2 Methodology

In order to fulfil the requirements set out in the project document (Annex 5), a methodology was developed and implemented in the four phases I: Pre-study preparations; II: Contacting administrative and scientific bodies; III: Compilation, analysis and interpretation of information; and IV: Preparation of conclusions and recommendations. Full details of the methodology can be found in Annex 6.

To collect information for Phase II on existing and future marine environmental assessments, a questionnaire (Annex 7) was developed and sent to more than 200 assessment secretariats and administrations (Annex 8).

At the beginning of the study an advisory group was established to guide the process and its progress. This group was composed of representatives from the sponsoring and executing bodies including UNEP-DEWA, the UNEP Regional Seas secretariat, IOC, Governments of Germany, Iceland, the UK and UNEP-WCMC. The group provided technical and editorial assistance throughout the study.

1.3 Organisation of the report

The report is divided into 4 sections. This section (section 1) introduces the scope of the survey and background to its implementation. Section 2 presents a summary of the key

¹ A glossary of working definitions and table of acronyms use in the report are presented in Annexes 1 and 2 respectively

findings from which the conclusions and recommendations are derived in sections 3 and 4 respectively. In order to keep sections 1-4 concise, details of the background, methods for the quantitative analysis of data, a glossary and table of acronyms are provided as annexes to this report.

2. SUMMARY OF KEY FINDINGS

This section presents a summary of the key findings of this survey based on the analysis of information provided for the various assessments. It considers the scope, timing and status of the assessments; looks at ways in which the GMA could integrate existing and foreseen assessments; outlines ways in which identified thematic and geographical gaps could be filled; and comments briefly on the review process used in this study. Due to the large number of assessments, it is not possible to refer to and acknowledge individually all of the excellent work that is being carried out in the international framework. The reader is directed Annex 9 for details of the analysis including relevant tables and figures.

2.1 Scope, timing and status of reviewed assessments and related activities

2.1.1 Scope

Most of the reviewed assessments are undertaken at a regional level and are currently ongoing. In geographical terms, the majority of provisions for assessing the marine environment are made for areas in the Northern Hemisphere ([Map 1](#), [Map 2](#)). There are large regional differences in the number of ongoing assessments, with the highest level of activity in the North East Atlantic (including the North Sea), the Baltic Sea and the Wider Caribbean regions. Even within regions, assessment coverage is not consistent, and in general those areas which are easy to access, such as coastal waters, are being most comprehensively assessed ([Annex 9.2](#))

The high seas and open oceans are poorly covered ([Map 1](#)), as are many marine areas around small island states. The coastal waters of developing nations are also poorly covered, due to lack of resources and capacity, both human and institutional. Capacity issues are discussed in greater detail below in section 2.2.3.

Analysis of thematic coverage ([Annex 9.3](#)) indicates that for the purposes of providing information for policy advice, the assessments of geophysical parameters (e.g. hydrography, oceanography and bathymetry) of the marine environment are producing sufficient information at a global scale. Remote sensing is being used more and more to measure these parameters.

Pollution, impact of human activities and ecological issues account for the themes addressed under most assessments reviewed. The assessment of fisheries and fish stocks, as well as pollution by hazardous substances and nutrients, are particularly well addressed at the regional scale. Assessment of alien species contamination has greater coverage at a global level rather than at regional levels. Principal thematic gaps in existing assessments include the understanding of ecosystem functioning (particularly of the mid ocean and open ocean/deep sea floor environments), socio-economic implications of the state of the marine environment, biogeochemical cycles and monitoring of marine pollution caused by atmospheric deposition. The relationships and interactions between the biological, chemical and physical characteristics of the marine environment, and how human activities affect and are affected by these interactions, are now beginning to be addressed, but need to be developed further.

Analysis of the longer-term assessments included in the review revealed a change of thematic focus over time. Thirty years ago, fisheries-related assessments dominated, such as the “Regular stock assessment of Atlantic tuna and tuna like species” undertaken by the ICCAT ([Annex 10, 2b](#)). This shifted to a focus on the assessment of pollution (20 to 30 years ago) (e.g. Pollution Load Compilation - Air (airborne load of nutrient and contaminants) by HELCOM ([Annex 10, 35a](#))). New assessments established in the last 10 years have a broader

focus and include a more encompassing monitoring of the marine environment (e.g. “The assessment of environmental impacts of coastal aquaculture”, GESAMP (Annex 10, 8c; “Yellow Sea marine environmental monitoring”, KORDI (Annex 10, 42c)). Some of this shift in focus over time might be due to a change in environmental policies and political needs, which influence these assessments. In addition, the change could be reflecting a greater scientific understanding of the complexities of the marine environment, recognizing that it is not possible to understand a system by looking at individual elements.

2.1.2 Timing

The majority of assessments reviewed in this study are currently in progress, with less than 40 of the 188 assessments listed being planned for the future (Annex 9, Figure 9.2). No detailed responses were given for assessments that have not yet started. Of the 82 regional and global assessments for which detailed information was provided, there are none that are planned for a period of greater than ten years. However, 39 are described as ongoing or open-ended with no specific termination date identified. Of those that are ongoing, 18 have been carried out for less than ten years, eight for up to 20 years, six for up to 30 years and six for over 30 years (Annex 9.3, Table 9.4). The longest running assessment was that of tuna population dynamics, commissioned in 1950 (Annex 10, 30).

The analysis identified a disparity between the funding provision and expected duration of assessments. The majority of funding is provided for a period of two to four years, but more than 60% of regional assessments and over 40% of global assessments are expected to continue for five years or more (Annex 9.1, Figure 9.3). This suggests that there are inconsistencies, or periods of uncertainty, during the 'life' of an assessment, which could threaten sustainability and could explain why many of the global assessments have more than one source of funding.

One quarter of the reviewed global assessments are non-recurrent, i.e. are undertaken as a single event (Annex 9, Figure 9.4). They provide snapshots of the status of a certain area or aspect of the marine environment at a given time, and are not able to show trends or changes over time, which are essential elements of a future GMA. Assessments and activities carried out on a continuous or regular basis tend to be those assessing fishery-related aspects and physical parameters.

Few global reports are produced annually, however nearly two thirds of all assessments produce reports at least once every two years. One fifth of global assessments only produce single reports. Anecdotal evidence from discussions with assessment users suggests that ten years is a reasonable period for repeating a global scale assessment. However, it would be of use to produce more frequent interim reports for specific thematic or geographical areas that are of particular interest to policy makers at that time, or are subject to rapid change where ten years is too long a timeframe.

2.1.3 Status

The basis and underlying requirements for carrying out the assessments reviewed vary between regional and global scales. In general, most assessments were established following some kind of requirement or request agreed at the international, intergovernmental level, within or external to the UN system. At the regional level, the majority of assessments are commissioned by intergovernmental agreements made under a regional convention or treaty, although some are a result of scientific cooperation/partnership or of intergovernmental requests formulated outside a convention/treaty framework. At the global level, international NGOs commissioned almost one third of the assessments and activities, implying a different type of assessment structure and mechanism.

For both global and regional assessments, the key stakeholders and end-users are identified as national governments, intergovernmental bodies and the scientific community.

Organizational funds and external sources are the primary means of finance for most assessments. Activity generated income, that is monies that are raised through assessment-related activities and outputs (e.g. the sale of reports and maps) was only rarely observed in the assessments reviewed here and plays a minor role. Most assessments set up under international conventions and financed directly or indirectly by national contributions, i.e. either Contracting Parties pay themselves for the assessment activities carried out in their national waters and/or a certain amount of the CP contributions is allocated to a special budget managed by the convention for funding the assessment activities. Assessments established and financed under the framework of an international convention have the advantage that the burden of funding is spread over a number of Contracting Parties, providing a more stable and sustainable financial basis, in particular for long-term assessments. Details of the analysis for this section are to be found in Annex 9.1.

2.2 Ways in which the GMA could benefit from existing and foreseen assessments and related activities

One of the most difficult tasks facing the development of a GMA mechanism will be how it can successfully build upon and integrate the large number of existing assessments in the marine environment. In this review alone, 188 assessments are listed, and 82 in detail at the global and regional scales from a sample of 64 organizations that responded to the questionnaire (responding organizations listed in Annex 8, Table a; summary results Annex 9.1). The main questions are (i) what are the basic requirements that the GMA will look for in a suitable contributing assessment? (ii) how will it identify these assessments? and (iii) how will it collaborate with them.

2.2.1 Basic requirements of the GMA

Two technical consultations convened in Reykjavik (UNEP, 2001) and Bremen (UNEP, 2002) outlined what would be expected from a GMA mechanism. The key requirements are listed below in bold and information resulting from the review was used to indicate how existing assessments are already meeting these requirements.

Be based on science: Over 70% of the 82 assessments and activities that responded are based on primary or scientific data (Annex 9.1).

Demonstrate implications of trends and change: Thirty nine of the assessments reviewed are set up as long-term (or ongoing) programmes with the potential to identify trends and change in the marine environment. Given the scope of these assessments, fish stock trends, and trends of marine pollutant concentrations can be expected. More recently there has been an increase in the number of assessments considering trends of the marine environment in its broader sense (Annex 9, Table 9.4). These will require sustainability over time. There are a high number of reviewed assessments that meet the criteria for sustainability and so potentially could contribute to the GMA (Annex 9.6).

Look at the socio economic aspects being influenced by changes: Socio economic aspects are currently not sufficiently covered by existing marine assessments and will need to be addressed by the future GMA.

Look at impacts of changes in the marine environment on ecosystem goods and services (impact of land based activities on uses of the marine environment)/ adopt an ecosystem approach. This has been difficult to analyse because, although the 'ecosystem approach' has been taken onboard over the last decade by an increasing number of marine environmental assessments, there is lack of consensus as to what an ecosystem approach entails. There are also variations between how different assessments are attempting the practical implementation of the approach. The GMA could benefit from the experiences gained under those assessments which consider ecosystems as a whole (e.g. the ecosystem status assessment carried out by CCAMLR in the Southern Oceans) and, in return, could provide overarching guidance in the further discussion and implementation of this approach.

Be based on regional / sub regional ecosystem assessments at the global level: Although many of the assessments reviewed are carried out at the regional level, there were no definite examples where the results of regional ecosystem assessments were feeding in to a truly global assessment. This is one aspect where a future GMA would have to establish new ways, networks and partnerships to ensure that regional and sub-regional assessment results are being collated to provide a bigger, global picture.

Target policy makers and indicate policy implications: National stakeholders (including policy makers), international bodies and the scientific community are the most common target and stakeholder groups of the reviewed assessments (Annex 9.1, Figures 9.6 and 9.7). The majority of assessment outcomes have either a direct or indirect link to national (76% of assessments reviewed) and international (86% of assessments reviewed) policy review and development (Annex 9.1, Figure 9.10). This provides a good basis to be utilised and supported by a GMA.

Be progressive and not static (allow for feedback and review): Methods and protocol guidelines are adopted for almost 80% of assessments, nearly all of which are subject to some kind of review mechanism. Approximately 60% of assessments allow for feedback from users as to the continued relevance of products. Existing review and feedback mechanisms will have to be analysed in greater detail to determine the most effective way for a GMA to interact with these assessments (Annex 9.1).

Consider the issues of data quality and periodicity: Data quality and comparability are bottlenecks in the assessment process at present. Even within well established assessments, such as those carried out under the OSPAR Commission in the North East Atlantic, continuous efforts are made to improve data quality and comparability (over time and space) to ensure that the assessment, interpretation, and any consequent advice to policy makers, is reliable. To assure data quality, most assessments have adopted some international methodological standards and procedures for their particular purposes. A potential role of the GMA would be to investigate to which extent these standards deliver comparable data and information, which could be compiled and assessed at the global level. As regards periodicity (Annex 9, Figure 9.4), regional assessments tend to be undertaken more regularly than global assessments, one quarter of which are implemented as a one time single assessment. A potential role of the GMA would be to work closely together with the governing bodies of existing assessments to ensure that their results are being made available in time to answer emerging information needs.

2.2.2 Identification of suitable assessments

There are several ways of identifying the most appropriate assessments and mechanisms. This review has been able to prepare an overview of existing assessments and to analyse them showing how reviewed assessments respond against the requirements of a GMA (as indicated at the Reykjavik consultation). There is no existing assessment that meets all of the criteria for integration into a GMA mechanism without an impediment or partial impediment (Annex 9.6, Table 9.9). Many of the assessments without significant impediments to their integration into a GMA are responding to regional seas agreements (UNEP and Non-UNEP) and are based on (or involve) some form of governmental agreement or regional convention. The definitions of the criteria used for this analysis are presented at Annex 12 and a summary of the results at Annex 13.

The results documented in the present review, as well as the discussions held and documentation prepared over the last two years in the context of implementing UNEP GC Decision 21/13, are a good basis for a future GMA to identify suitable assessments.

2.2.3 How a GMA could collaborate with these assessment or activities

The written and narrative responses received and analysed in the context of this study show that there will be number of issues to be addressed, and steps required, to establish an

effective and mutually supportive collaboration between the existing assessments and a GMA process. (Annex 9.4, Annex 11: summary of narrative responses; Annex 10: complete list of assessments for which section A of questionnaires have been reported).

Involving the right stakeholders.

Representatives of organizations and secretariats responsible for global and regional assessments should be involved in the planning of a GMA to enable the best use of their expertise and experience at the earliest stage. The intended end-users, in this case national and regional policy makers, must take responsibility and ownership of the process from the beginning. The assessment set up must be guided by identifying the type of information that is required and the most appropriate way of presenting this information, and supporting the exchange of views and lessons learned under existing assessments (Annex 9.5 for lessons learned). National experts and policy makers have a crucial role to play in the governing bodies of regional and global assessments contributing to the GMA to ensure that these assessments are appropriately supported and positioned to be able to feed into the global framework.

Collaborating with existing assessments

To take all relevant regional and global assessments into account in a GMA process will involve a great deal of collaboration. The GMA should act as a coordinator / facilitator in creating bi- and multilateral partnerships and frameworks not only for monitoring, reporting and assessing marine environmental data and information, but also for networking of experts and organizations that need to collaborate.

Collaborations will be required to enable existing regional assessments to provide input to the GMA. There are many organizations that have long standing experience with reporting on the state of the marine environment at a regional level. Within the framework of the OSPAR Convention, for example, Contracting Parties produce in a joint and cooperative effort, a detailed quality status report of the North East Atlantic every ten years. Current work being undertaken by the EC in their development of a marine strategy to improve the reporting and assessment of the status of European marine waters is expected to provide useful lessons to be taken into account in the establishment of a GMA.

At a global level, GESAMP have been producing ten yearly reports on the status of the marine environment. The mandate of GESAMP has been undergoing a review, broadening the focus from pollution to a more holistic assessment approach. GESAMP has highly credible and very useful experience in gathering of regional information, and in compiling such reports, which would be of great value to the GMA.

The GOOS family of activities, which are currently in their pilot phase and due to be implemented by 2010, are establishing a very interesting structure. GOOS is a global framework, in which regional bodies are forming and adopting parallel frameworks to feed in a wide range of data and information related to the seas and the marine environment. Efforts are being made to increase collaboration between the GOOS regional bodies and other existing regional bodies (e.g. Regional Seas Conventions and Programmes). In particular the collaboration in areas of higher assessment activity, such as in the Baltic (between BOOS and HELCOM), and in other European marine waters (e.g. between Euro GOOS and ICES / OSPAR) would provide the GMA with a potential entry point for cooperation.

GIWA is a worldwide assessment working for a period of four years in 66 sub-regions ([Map 2](#)). It aims to provide sound scientific advice to decision-makers and managers concerned with water resources and dealing with environmental problems and threats to trans-boundary water bodies. It is to be a systematic assessment of the environmental conditions and problems in international waters, comprising marine, coastal and freshwater areas, and surface waters as well as ground waters. Of particular interest to a GMA is the dynamic approach GIWA is taking to assess the existing situations and to developing scenarios of the future condition of the world's water resources and analyse policy options.

As well as identifying collaborations with broad scale assessments and monitoring programmes, the GMA may benefit from partnerships with a number of specialist organizations. These could provide GMA stakeholders and end-users with access to specific types of data and information from a particular area and/or for a defined theme, such as fisheries, coral reefs, sea grasses or mangroves. On a case-by-case basis, the availability of such specific data and information within an existing regional or international framework will have to be assessed by the GMA. Such an evaluation will enable the GMA to highlight gaps and insufficient resources/capacities, and to provide support for the work and the assessments carried out in these frameworks where necessary.

Coping with data comparability

As explained in section 2.2.1 above, data comparability and quality is a major bottleneck of existing assessments (Annex 9.1). It will be an important function of a GMA to encourage and support the development of a standardized approach to data collection, storage and comparability within the various regional and global assessment frameworks. This would make international data more useful to a wider audience and might prevent national authorities being required to provide the same (or very similar) data set(s) to more than one convention, as is currently the case.

Overcoming issues of capacity

Concerns regarding the great disparities in inter- and intra-regional capacities for undertaking assessments of the marine environment have been raised at many stages in this review (Annexes 9.1, 9.2, and 9.5). Capacities of assessments vary considerably in terms of human and financial resources, technical infrastructure, appropriate legislation, and in the ability of countries (individually or jointly) to prioritize these issues. The UNEP Regional Seas framework is an example that demonstrates the varying capacity between regions. Some of the regional sea conventions and programmes (e.g. those established for the wider Caribbean and the Mediterranean) have very effective action plans in operation and carry out regular assessments of the marine environment, thereby providing essential contributions and advice for policy makers. Other regional sea frameworks (e.g. the North East Pacific) have very few activities, or are not yet fully established. It will be important for a GMA mechanism to recognize this variation in resources and capacity and to account for it in the GMA design. The experiences of other bodies such as GESAMP which work at a global level but depend on regional activities for information, indicate a very wide variation in the availability, quality and reliability of regional reports. There may also be different historical experiences of regional collaboration.

Capacity building has been identified as a common need in many responses analysed in this study (Lesson 2, Annex 9.5) and addressing this need will be pivotal for the success of the GMA. Possible ways in which this can be done are through the use of inter-regional partnerships, cross-regional meetings and workshops to share experiences and techniques; the exchange of people and the use of inter-regional consultants to train counterparts in countries.

A minimum level of information could be gathered at a global scale, complemented by information with a greater level of detail from regional areas or specific subjects, in particular where capacities are higher and regional bodies more active.

History of regional collaborations

The history and different success of collaboration between countries in a certain region will have to be taken into account by a GMA. This will be of particular importance when determining the best way to provide support to initiate new, or further develop existing, collaborative arrangements and agreements between partner states with respect to the assessment and sustainable use of the marine environment and the marine resources which they share.

2.3 Ways in which thematic and geographical gaps can be filled

The major geographical gaps identified (Annex 9.2) are coverage of the high seas and open / deep oceans, and the marine waters of developing countries and small island states, where there is a need to increase involvement and capacity to improve awareness and the level of marine environmental information available.

Principal thematic gaps identified in the analysis (Annex 9.3) include understanding of how ecosystems function (particularly those that are difficult to access such as the mid oceans and open ocean/deep sea floor communities); socio-economic implications relating to the state of the marine environment; and biogeochemical associations and interactions.

Inclusion of all thematic gaps that have been identified into existing assessments or a GMA might not be possible or desirable; however, to ensure inclusion of the most pertinent themes in any assessment requires regular communication and full involvement of all stakeholders. If the key players and end-users were involved in the assessment process, then feedback as to the uptake and use of the information provided would feed into establishing the objectives and foci for the next phase of the assessment. Given that the proposed GMA process allows for such feedback, it should be able to respond to changing needs for information over time.

These thematic and geographical gaps are increasingly recognized by both the political and public sectors as important to the international community. Recent international efforts, in particular at WSSD² and the UN General Assembly³, have provided opportunities and orientation for countries and regional / global organizations alike to address issues concerned with the monitoring and sustainable management of the marine environment. The establishment of links with resource sustainability and poverty reduction have also opened new doors to financial support and partnerships, which promote activities that will improve the information available to policy makers.

High seas and open/deep oceans: The remoteness and inaccessibility of the high seas and open/deep oceans severely restricts our knowledge about these vast marine areas. Thematically, gaps in understanding can be attributed to the difficulty in overcoming these challenges to look at ecosystem interactions. Increasingly, advanced remote sensing technologies are being applied, which allow more frequent and detailed coverage of these parts of the oceans. In addition to the collection of surface data from satellites and other airborne means, there has also been an increasing use of remotely operated vehicles (ROVs) and other devices (such as free drifting data collecting floats). Such devices help to reveal the physical three-dimensional nature of this environment, although still focusing on surface processes. The establishment of frameworks to underpin assessments such as the GOOS component for the open oceans, and an increasing interest from the scientific community, has led to a rise in activities in this region. The open oceans and deep waters also require improved provision. At present, the main international organizations covering these areas are UNCLOS and the FAO fisheries bodies. UNCLOS delegates the responsibility for monitoring to regional bodies and is regarded as a too general framework for the purposes of a regular assessment. The FAO fisheries bodies are highly focused on the assessment of fish stocks, in particular those of commercial interest. Increased information on the state of open ocean and deep water marine environments could support the necessary political pressure needed to increase international cooperation and responsibility for the high seas and encourage implementation of the Law of the Sea.

Increased participation of developing countries and small island states: There are a number of ways in which support can be given to enable small and developing nations to participate more fully in regional and consequently global marine assessments. A GMA mechanism could support emerging partnerships between two or more regional bodies, as for example that between the OSPAR Commission and West and Central African Regional Seas

² Paragraph 34b of the Plan of Implementation agreed at WSSD

³ Paragraph 45 Res. A/57/L.48/rev.1 of UN General Assembly at its 57th Session

programme under the Abidjan convention, with whom they share a mutual border in the Eastern Atlantic Ocean. This kind of partnership would enable the sharing of expertise and experience, *inter alia* in developing and implementing marine assessments and policies. The OSPAR Commission has established a number of marine environmental assessment programmes and activities, which are being carried out by 15 European countries jointly or individually and which have contributed to the comprehensive knowledge of the state of the North East Atlantic. On the same lines, a GMA would be able to support collaboration between regional organizations to encourage development of assessment capacities in areas currently insufficiently covered. An example for support to Small Island States resulting from the WSSD is the proposed US/ UK partnership to promote the integrated marine management of the Caribbean.

There are also other types of collaboration, which could be used to strengthen capacity over time in a sustainable way. Some international programmes, such as the FAO/DFID Sustainable Livelihoods Fisheries Programme in West Africa, have been using the concept of employing consultants from another country in the same region to work along counterparts. This aims to increase the sharing of skills and expertise within the region, as well as increasing national capacity on the job. Where there are industry or private sector interests in the marine environment in an area where capacity to contribute reliable data or personnel is low, partnerships should be sought. Most industrial activities to develop, explore and extract natural resources from the marine environment require some form of environmental impact assessment (EIA) to be undertaken. These assessments are often required to be made publicly available and tend to compile detailed local information about potential and actual physical, chemical and biological impacts (and in some cases socio-economic concerns) of the proposed activities. The development of initiatives such as ECOiSHARE, a partnership between UNEP-WCMC, Shell, BP and Rio Tinto, make EIA information available on the internet, thereby enabling stakeholders, policy makers and the general public quick and easy access to up-to-date, detailed information at a local level.

2.4 Comments on the review

2.4.1 Notes on the effectiveness of data collection

- The structured questionnaire developed in the context of this study (Annex 7) provided the most suitable tool for collecting information for the general review of regional and global assessments. It enabled the collation of a broad range of data on ongoing or foreseen assessments from a large number of geographically disparate individuals, organizations and secretariats in a short time frame.
- The structure of the questionnaire was designed to minimize the opportunities for interpretation and free response, and thereby increase comparability of responses.
- The questionnaire was successful in bringing together the key lessons that have been learned in the assessments reviewed (Annex 9.5).
- The return rate was satisfactory with 30% returns from 56 organizations providing summary details for 188 assessments. 50 organizations provided in depth responses for 88 assessments carried out at national (7% of returns), regional (61% of returns) and global (32% of returns) level (Annex 9.1).
- Notwithstanding the above, there are limitations in trying to approach a broad range of individuals and institutions with a single, uniform format for collecting information. The use of a separate questionnaire specifically designed for the users of assessments would have been interesting and more appropriate for several respondents, such as national policy makers and regional policy makers (e.g. European Commission), which did not feel that the current questionnaire was appropriate for them.

- Unfortunately, returns were not received from a number of assessments which were indicated as being of potential importance to a GMA mechanism in UNEP consultation meetings (Annex 8, Table d).

2.4.2 Notes on data analysis

- The results are based on responses given in the questionnaire returns, which, in most cases, rely on the interpretation and perception of the individual respondent. The analysis strives to present an analysis of this collated information in an objective manner.
- GIS would provide a very useful tool to further analyse and present the geographical gaps in coverage.
- Regional assessments are considered those with a regional remit / mandate.
- Global assessments are considered those with a global or a non region specific mandate, even though they might not have an actual global coverage (i.e. those not restricted to a specific region and which could theoretically, if not actually, be global).

3. CONCLUSION

Sustainable management of the world's oceans is of major concern to the international community to ensure the livelihood of millions of people. In the Plan of Implementation adopted at WSSD, world leaders agreed on a number of activities and actions with focus on the oceans and their resources.

The successful management of the marine environment imposes very different challenges to that of the terrestrial environment. The oceans are physically contiguous, without clearly identified political boundaries and are without evident visual surface indicators reflecting their environmental state, which could be used to aid policy makers in their national and international efforts to conserve, protect and use the marine resources in a sustainable manner.

Regional assessments are necessary to manage a coordinated data collection and assessment in defined areas of the world's oceans. This report highlights that with sufficient support for the countries and organizations involved, regional assessments are working well to provide some of the required information. What is lacking at the moment is a global overview bringing the various regional assessments together, based on science and responding to the needs of policy makers for reliable information about the state of the global marine environment that would allow them to take necessary and timely action.

Arguments presented support the need for a dedicated mechanism to report regularly on the state of the world's oceans, as put forward by UNEP GC Decision 21/13, paragraph 34b of the Plan of Implementation agreed at WSSD, and as decided by the UN General Assembly at its 57th Session (Res. A/57/L.48/rev.1, paragraph 45). The outcome of this study supports this need and shows that existing assessments and related activities, in their present form, are not able to achieve the expectations of the proposed GMA mechanism.

4. RECOMMENDATIONS

The review and analysis of the types of assessments that are currently underway and planned to assess the marine environment have allowed the following recommendations to be made in view of a proposed Global Marine Assessment mechanism:

1. To be sustainable, a GMA must have the support of national stakeholders and use, where possible, the support of existing regional agreements, frameworks and organizations.
2. For those marine areas or marine environmental issues that currently are not, or are insufficiently, covered by assessments, a GMA will be required to support existing capacities and develop new capacities, in particular for the assessment of:
 - (i) the high seas and deep / open waters;
 - (ii) the marine environments of developing nations and small island states (including Small Island Developing States);
 - (iii) the interactions between marine and freshwater systems.
3. A GMA should endeavor to use primary data where it is available. This information should be subject to internationally accepted standards and quality assurance measures to ensure credibility.
4. The planning, implementation and review of a GMA should involve representatives from existing assessments to avoid duplication and to learn from their experience.
5. A GMA mechanism must ensure the involvement and ownership of the process by the end-users, in particular national and regional policy makers, so that it will be flexible enough to meet their changing needs.
6. A GMA should involve the private sector, as well as industrial and environmental NGOs, as stakeholders in the assessment process. These sectors could provide a useful source of information and also help to raise awareness and increase responsibility for the marine environment.
7. A GMA mechanism must recognize the differences in national and regional approaches, capacities, resources and constraints for collaboration, and incorporate these into its design.
8. A GMA mechanism should use existing regional capacity where it exists, and facilitate the transfer of skills, the development of training and the building of capacity in geographical and thematic areas where it is lacking.
9. In addition to its primary role of regularly reporting on the status of the marine environment, a GMA has the potential to:
 - (i) serve a role as facilitator to encourage the sharing of information and experiences, and to promote collaboration and partnerships between regions and disciplines, thereby improving international networks for issues relating to assessment of the marine environment;
 - (ii) provide an advisory role to existing assessments, spreading methods of best practice and developing standardized methods for data collection and quality assurance.
10. A GMA should aim to streamline existing international activities concerning the assessment of the state of the marine environment and contribute to the increased collaboration between UN agencies.

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