



4TH GLOBAL CONFERENCE ON OCEANS, COASTS, AND ISLANDS

Working Group on Freshwater to Oceans



POLICY BRIEF ON FRESHWATER AND OCEANS



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Global Forum on Oceans, Coasts, and Islands--Strategic Oceans Planning to 2016

The Global forum on Oceans, Coasts, and Islands has undertaken a strategic planning effort for the period 2006-2016 to develop policy recommendations for specific next steps needed to advance the global oceans agenda aimed at governments, UN agencies, NGOs, industry, and scientific groups. To this effect, Working Groups have been organized around 12 major topic areas related to the global oceans commitments made at the 2002 World Summit on Sustainable Development and to emerging issues facing the global oceans community.

The Working Groups have been organized and coordinated by the Global Forum Secretariat, under the direction of Dr. Biliana Cicin-Sain, Co-Chair and Head of Secretariat, Global Forum on Oceans, Coasts, and Islands, and involving the following staff from the Gerard J. Mangone Center for Marine Policy, University of Delaware: Miriam Balgos, Kateryna Wowk, Caitlin Snyder, Shelby Hockenberry, and Kathleen McCole.

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Global Forum on Oceans, Coasts, and Islands

Working Group on Linking the Management of Freshwater, Oceans, and Coasts

**Policy Brief:
Linking the Management of Freshwater, Oceans, and Coasts**

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Foreword

Working Group on Linking the Management of Freshwater, Oceans, and Coasts

To address degradation of the marine environment, it is important to consider and incorporate the impacts of land-based activities along the coast, as well as further inland. Activities that occur many miles inland can have an effect not only in coastal areas, but also far out at sea. Examples of these impacts include salt water intrusion into historically freshwater areas, nutrient over-enrichment, and changes in sedimentation patterns. To preserve overall ecosystem integrity, it is imperative to link management measures regarding oceans and coasts to the management of river basins and watersheds.

Discussions of freshwater management and oceans management, however, typically take place in separate fora. It is important to address the challenge of linking freshwater to coasts and oceans from a new collaborative perspective that examines how decisionmaking and institutional development from both upstream and downstream management could be reconciled at international, regional, national, and sub-national levels.

Discussions at the Global Conference on linking freshwater to coasts to oceans

In an effort to address this disconnect between the management of inland waters and coastal ecosystems, the Working Group on Linking the Management of Freshwater, Oceans, and Coasts has identified five goals in its Policy Brief:

- 1) Identify (and recognize) the costs and implications of failure to link Integrated Water Resources Management (IWRM) to Integrated Coastal and Ocean Management (ICM)
 - Hotspots (ecosystem, economy, and human)
 - Adaptation to climate change in coastal areas
 - Water supply in coastal areas (e.g., salt water intrusion)
 - Institutional arrangements and investments
- 2) Challenge participants to identify ways to better link IWRM and ICM that can be suitable for governments, donors, planners (land and marine), and key stakeholders.
- 3) Identify success stories.
 - Institutional mechanisms that have worked (or are working)
 - Financing (sustainable mechanisms and international support)
 - Social (community-based management)
- 4) Provide input to the final Global Forum Conference Report
- 5) Identify post-Hanoi activities, including input to the marine section at the 5th World Water Forum (Istanbul, 2009).

The Global Forum Secretariat would like to thank the leaders of the Working Group--Clement Lewsey, Gonzalo Cid, Jonathan Justi, Al Duda, Tom Laughlin, Torkil Jönch-Clausen, Andy Hudson, and Porfirio Alvarez-- for their participation and input to the working group process. The efforts of Gonzalo Cid, Clement Lewsey, and Jonathan Justi (NOAA-NOS) in drafting the policy brief, as well as of Torkil Jönch-Clausen, Andy Hudson, and Larry Hildebrand in providing comments to the brief are acknowledged with sincere thanks.

Biliana Cicin-Sain
Global Forum on Oceans, Coasts, and Islands

POLICY BRIEF: LINKING THE MANAGEMENT OF FRESHWATER, COASTS, AND OCEANS

Background Information

The effect of land-based human activities is the most important driver of marine pollution and impact on marine ecosystems and coastal and marine-dependent economies. The UNEP-Global Programme of Action (GPA) estimates that about 80% of the pollution load in the oceans originates from land-based activities, which threaten health, productivity, and biodiversity of the marine environment. The resulting impact of this pollution affects some of the most productive areas of the marine environment (ecologically and economically), such as estuaries and near-shore coastal waters. Linking watershed and coastal management—especially in those areas affected by the availability, use, quality, and influence of freshwater—is now recognized as a need to be addressed by multiple parties, and one that requires commitment and preventive action at all levels: local, national, regional, and global.

Freshwater runoff has a major impact on the health of important coastal and ocean ecosystems, ocean productivity, ocean circulation patterns, and hydrological balances, which are also influenced by natural fluctuation of the global climate system. The natural connectivity of rivers and oceans should be considered in coastal and watershed planning, especially in areas where this connectivity is highly sensitive and/or vulnerable (e.g., deltas/estuaries, low-lying coastal wetlands, small islands, glacier fjords, coral reefs).

Linking the management of freshwater and coastal/marine areas is an issue raised by

several international organizations and conservation/environmental fora (e.g., UNEP-GPA, World Water Council, Global Water Partnership, Global Forum); in particular, they focus on the direct impacts from inland activities (e.g., agriculture, forestry, mining, urban development) on marine/coastal ecosystems, resources, and activities. However, other aspects of this linkage—such as human health and water safety issues, livelihood of coastal communities, and potential impacts from water-cycle changes and sea-level rise due to climate change impacts—have not been directly addressed within the context of land-based impacts on the marine environment.

Water resource management is a cross-cutting issue that affects environmental, social, economic, cultural, and political aspects in any country or region. Under this consideration, achieving integrated coastal and ocean management requires integrating watershed and land-based activities into the planning process; this is a major task, since most countries have separate management approaches for oceans and freshwater. These separate approaches include different and/or overlapping policies, authorities, national/local priorities, and decision-making power, which, in most cases, hinder any attempt at an integrated planning scope.

There have been some advances in developing the framework for integrating watershed and coastal management (e.g., GPA-based national programs of action), but the global challenge still remains regarding the capacity to implement these programs, and to secure the permanent commitment, funding, and resources

required given the magnitude of this integration.

Integrating existing effort at the national level (rather than creating new ones) is the key for successful implementation of a watershed and coastal management strategy. The Beijing Declaration, resulting from the 2006 Second Intergovernmental Review of the GPA, encourages countries to strengthen efforts to develop national programs of action and mechanisms for the protection of the marine environment from land-based sources of pollution, in concert with relevant national legislation, projects/initiatives, and budget planning (e.g., national integrated water resources management plans, coastal zone management initiatives, water safety plans, national environmental policies, etc.).

Climate change impact on water resources

The Intergovernmental Panel on Climate Change (IPCC) predicts that climate change will increase current stresses on water resources from population growth and economic and land-use change. Predicted reduction of glacier and snow cover due to temperature increase will affect water availability, hydropower potential, human health, and water cycle seasonality (including effects on terrestrial and marine ecosystems)¹.

IPCC predicts that the negative impacts of climate change on freshwater systems will outweigh its possible benefits. Areas in which runoff is projected to decline face a reduction in the value of the services provided by water resources. The potential benefits of increased annual runoff in some areas will be tempered by negative effects of increased precipitation, seasonal runoff shifts on water supply, water quality, and flood risk. In coastal areas,

¹ IPCC: Climate Change 2007: Synthesis report.

sea-level rise will increase water resource constraints due to saline-water intrusion into groundwater supplies².

Increased runoff sedimentation and freshwater dilution on coastal areas will have an adverse effect on many coastal/marine ecosystems. Also, coastal erosion and floods will especially affect large populations in low-lying delta areas and small islands.

“Freshwater to oceans” hotspots

Some especially sensitive coastal areas are more vulnerable to the combined impact of land-based pollution and climate change effects. IPCC has identified some hotspots for vulnerability³ and potential impacts of climate change considering the characteristics of exposure, sensitivity, and adaptive capacity. Among the hotspot areas assessed by the IPCC, those with clear land-ocean interaction characteristics include:

- Deltas and estuaries (especially populated megadeltas)
- Coral reef areas
- Low-lying coastal wetlands
- Small islands
- Sand/gravel coastlines/beaches

Also, any type of coastal/marine protected area directly influenced by land-based activities will be impacted, within and outside their boundaries, by changes in water quality, nutrient runoff, and climate change. Management of MPAs should be integrated with land-based planning, especially in those cases with land-ocean dependent interactions.

The combined effect of climate change (e.g., sea level rise and coastal erosion) and human impact is increasing the

² Op. Cit.

³ IPCC, 2007: Summary for policymakers. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the 4th Assessment Report of the IPCC.*

vulnerability of all hotspots listed above. Likely impacts include:

- Shoreline retreat due to coast erosion and sea level rise.
- Subsidence of deltas due to runoff pattern change (e.g., change of precipitation), sediment starvation and river flooding due to human intervention.
- Increasing salinity in estuaries due to sea level rise, causing productivity and biodiversity changes, and potential eutrophication due to changes in freshwater residence time.
- Reduction of mangrove areas and saltmarshes due to increased frequency and intensity of severe weather events and changes in the hydrological regimes.
- Water availability and coastal protection in small islands due to coastal perviousness reduction and the reduction of coastal natural coastal buffer areas (human intervention), change in precipitation cycles, and greater frequency of severe weather events.
- Reduction of coral reef areas due to anthropogenic impact and bleaching associated with climate change.

The sensitive nature of these hotspots to human intervention and the potential effects of climate change require a special and comprehensive protection that requires both an integrated planning system to unify upstream, downstream, and coastal areas and an understanding of the adaptive capacity of humans and natural systems.

There is a huge gap between developed and developing nations in capacity for adaptation, especially in those hotspot where a high concentration of human population can be found. Addressing adaptation issues in developing nations

and improving the institutional capacity to respond to these issues should be a priority for international cooperation and donors' agendas.

Need for integrated planning and an integrated vision

Land and coastal planning have traditionally been managed as separate sectors from both institutional and disciplinary perspectives. Important issues to address in integrative planning include: centralized decision-making and planning, low-level priority traditionally given to environmental issues, weak lead institutions, subsidies to some economic activities, development models, lack of information, and lack of legal and institutional authority.

The understanding of the impact of upstream human activities (e.g., changes in water courses, agriculture, sewage) to the downstream areas and coastal zones and their effect on ecosystems and human health is vital to effective decision making, physical and policy planning, and community support to national- or regional-scale initiatives. Integrated watershed and coastal management has a transboundary nature (nationally and internationally) that requires cross-sectoral and cross-jurisdictional arrangements and support (including harmonized policies, financing, and information gathering/sharing); integrated management instruments; and an ecosystem-based management approach (which should consider water and/or ecosystems as key elements for planning).

There are several planning instruments that can provide upstream and downstream integration. For instance, spatial planning systems allow for management of large ecosystems with long-, medium-, and short-term perspectives and can incorporate other decision-making elements such as ownership or user fee

systems. Today's spatial planning systems need to address shortcomings in the areas of biodiversity, climate-change adaptation, water resources management, and marine ecosystems.

Integrating watershed and coastal resources management into spatial planning can improve the latter's involvement of stakeholders and increase its focus on water resource management. Spatial planning also must incorporate biodiversity management, particularly when the area in question includes or influences protected zones (both terrestrial and marine).

Another important component of the upstream-downstream integrated vision is outreach, education, and participation mechanisms addressed to the involved stakeholders. This component ensures that the different actors (e.g., fresh- and marine-water users, local and national authorities, donors) are involved in decision-making processes, and helps them to understand the needs of the other sectors and the impacts of their activities on the entire system and on other actors' activities. As the traditional planning system has managed freshwater and marine systems separately, the involvement of stakeholders into decision making, if any, has been sectoral and/or has differed according to the management and planning level in which they may be involved.

The sectoral approach to management (decision making and investment) has probably been the cause for the lack of involvement (or knowledge) and participation of a wider range of stakeholder into decision making, and lack of knowledge of other actors' current and potential impact of their activities in the entire system. The idea of "whatever you do to the river basin will affect the ocean" is not very well understood in many sectors of the society; even decision-

makers may have misconceptions about the dimension of the problem and the effects on the national economy.

Addressing the planning approach and stakeholder participation and education should be a priority for national governments, and especially for regional and international organizations. This is particularly important in developing nations and when the planning involves historically excluded groups such as indigenous or poor communities, which can greatly contribute to the integrated planning system.

From planning to action: the problem of implementation

Linking freshwater to oceans is not a new integrated management concept. The need to integrate watershed and coastal management has been identified and recommended by different international fora and organizations (e.g., UNCED, UNEP-GPA). In the last decade many countries or regions have worked in assessing their issues and needs, designing land-based planning, and developing the institutional and/or legal framework for addressing integrated watershed and coastal management (e.g., regional protocols on land-based source of pollution, UNEP-GPA-framed national programs of action, and integrated coastal and watershed management legislation), most of it funded by international cooperation. However, very few countries have effectively been able to fully and permanently implement plans at the national or sub-national level.

Some of the important issues to address for implementation are weak institutional structures, which are not able to carry initiatives over from one administration to the next, lack of capacity (personnel, planning, mechanisms, etc), lack of high-level commitment, and financial constraints (including duplication of

efforts by countries and donors) that are beyond countries' short/medium-term capacity.

Many national and international resources have been invested over the years in assessing the needs of countries for integrated watershed and coastal management, as well as in developing the necessary frameworks for its implementation. Although useful, these efforts will require that national governments and international donors, from now on, create incentives and emphasize bridging the gap between assessment and full-scale implementation and sustainability.

Suggested priority issues for the working group

Linking freshwater to oceans is a wide and cross-sectoral issue that would be difficult to analyze in its full dimension within the time frame of the global conference. However, from the potential policy perspective, some priority issues can be identified based on initial recommendations of the core-organizing Working Group:

- 1) Build capacity and propose effective actions/recommendations for the identified freshwater/marine hotspots, considering both ecosystem and human perspective.
- 2) Analyze the identified impacts and suggested solutions to short/medium term effects of climate change on freshwater and marine systems (and their transition areas), especially in critical habitats and hotspots.
- 3) Develop strategies to integrate traditional land and marine planning into effective integrated watershed and coastal area management (including linking

upstream-downstream, and implementation).

- 4) Identify the social and economic costs associated with land-based sources of marine pollution and how integrated watershed and coastal management can provide cost-effective solutions for local/national economies.

Also, the working group should address a position/strategy to increase/improve the marine-related topics at the 5th World Water Forum (Istanbul, March 2009). Marine issues have not had a strong presence in the sessions and final recommendation of the past WWFs. This Working Group and the results of the Hanoi Conference should take the lead in making marine issues more visible at the Istanbul forum.

Also, for the purposes of the Hanoi Global Conference, it is important that the working group take into account that the proposed topics, challenges, and recommendations of linking freshwater to oceans should be closely discussed with other working groups at the forum. Integrated recommendations with the other working groups will lead to a consistent message about the importance of freshwater and marine ecosystems, especially having the goal of delivering a strong message at the 5th WWF-Istanbul. Some interrelated issues include:

- Theme 1: LMEs
- Theme 1: Marine biodiversity and MPAs
- Theme 1: Fisheries and aquaculture
- Theme 1: Tourism
- Theme 2: Adaptation
- Theme 2: Public Health
- Theme 2: Vulnerable ecosystems
- Theme 2: SIDS
- Theme 3: Governance beyond national jurisdiction (transboundary watersheds)

- CCI: Public education, outreach, media

A comprehensive integration of freshwater and marine-related issues may have an important role in helping achieve some of the marine-related world conservation targets (e.g., WSSD, CBD). International commitments and binding/voluntary instruments developed to protect significant coastal ecosystems, as well as the efforts to develop and manage marine protected areas, may not be sufficient if external impacts can affect the health of coastal ecosystems. As is the case in many countries, if coastal management planning does not consider pollution from land-based sources, the consequences may not be foreseeable and the long-term efforts for coastal conservation and sustainability could be worthless. Integrating watershed planning into coastal/marine conservation efforts may be a long process, but it will be more effective in the long-term to help reach both the marine and freshwater global conservation targets.

Recommendations for addressing priority issues at the Forum

There is not a unique and standardized methodology that can provide answers to the very complex issue of linking freshwater to oceans, especially taking into account environmental, social, cultural, political and economic variables (in all of them including also the potential impact of climate change). However there is valuable information provided by case studies, documented experiences, and compendiums of lessons learned/recommendations by different types of organization and/or experts.

Experiences from different ecosystems and/or countries bring different approaches and useful information that can help in building the necessary political awareness and commitment to address the current and future problems of integrated watershed

and coastal area management. It is important to have in mind that some general recommendations have to be applied at the local/national level and a custom-made approach may be necessary. For instance, climate change will have a gradual effect and will not have the same impact in all similar areas globally. Local impacts of climate change, risk, water availability and use, and changes in freshwater and marine ecosystems have to be modeled/predicted for each particular case.

Each of the priority issues above could be addressed at the Working Group session(s) with [some of] the following proposed questions:

Build capacity and propose effective actions/recommendations for the identified freshwater/marine hotspots, considering both ecosystem and human perspective.

- What would be the priority hotspots (using the natural systems identifies by the IPCC) by region that can help to promote the issue of linking freshwater to oceans?
- What is the level of knowledge we have about the potential impact of climate change on the priority hotspots? What is (or what is the limit of) the natural adaptation capacity of these hotspots?
- What do we know about the consequences (natural, economic, social) of changing or losing those hotspots?
- What would be the priority actions (research, investments, capacity building, planning) for each one of the priority hotspots?

Analyze the identified impacts and suggested solution to short/medium term effects of climate change on freshwater and marine systems (and their transition areas), especially in critical habitats and hotspots.

- What will be the adaptation strategies to face climate change impacts in the most vulnerable coastal areas (e.g., SIDS)?
- What would be the priorities for international cooperation and funding? Where and when?
- What will be the expected impacts on coastal ecosystems and their associated resources (e.g., fisheries, aquaculture, tourism)?
- What will be the expected effect on coastal communities (e.g., health, economy, migrations, poverty)?

Develop strategies to integrate traditional land and marine planning into effective integrated watershed and coastal area management (including linking upstream-downstream, and implementation).

- What are the incentives to promote integration (e.g., among national agencies, jurisdictions, political levels, stakeholders, and decision-makers)?
- How could we be more effective in promoting this integration among political leaders and national planners?
- What are the cultural and political barriers to achieve integration (e.g., inland vs. island societies)?
- How to challenge the current and traditional territorial planning process that separates the inland and offshore interlink (e.g., how to see beyond the blue-water spot in the management plan map)?
- How to promote an IWCM-planning incentive program among major donor agencies?
- How to link the development of NPAs (or similar instruments) to the requirements of investors and/or donors?
- How to avoid duplication of efforts (among donors and among national

- agencies) to maximize the planning and implementation resources?
- What are the [most effective] tools to demonstrate the need to achieve integration (e.g., economic valuation, economic activity impact, human health cost, ecosystem service loss, etc.)?
- What are the other priority needs (and how to address them), besides funding, required for effective implementation of national/local IWCM plans?
- How to be more “aggressive” in identifying polluters upstream (and their effects on the environment)?
- How can the marine environment community get (and work) together with the inland planners and environmental groups?
- How to link inland management planning with management plans of particularly sensitive coastal areas (e.g., MPAs) or habitats?
- What are the elements and key strategies for developing integrated water educational programs and involvement for key stakeholders and decision-makers?
- What are the most effective mechanisms for sharing information and/or data?

Proposed goal(s) for the working group

- 1) Identify (and recognize) the costs and implications of failure to link IWRM and ICM.
 - Hotspots (ecosystem, economy, and human)
 - Adaptation to climate change in coastal areas
 - Water supply in coastal areas (e.g., salt water intrusion)
 - Institutional arrangements and investments
- 2) Challenge participants to identify ways to better link IWRM and ICM that can be suitable for governments, donors,

planners (land and marine), and key stakeholders.

- 3) Identify success stories.
 - Institutional mechanisms that have worked (or are working)
 - Financing (sustainable mechanisms and international support)
 - Social (community-based management)
- 4) Provide input to final Theme 1 (and Forum) Report (e.g., recommendation and next steps).
- 5) Identify post-Hanoi activities, including input to the marine section at the 5th World Water Forum.

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* Please note: Members of the Steering Committee participate in their individual capacities.