



The blue trinity: freshwater, oceans and climate change

The interface between freshwater and oceans captures the vital development and environmental challenges of our time. Coastal communities and Small Island Developing States (SIDS) face increasing socio-economic and environmental risks as a result of climate change. These risks significantly constrain their ability to achieve a sustainable development; and for some, threaten their territorial integrity, economic viability, and survival at large.

Freshwater and oceans – working together to face climate change

The impacts of climate shifts continue to affect lives and livelihoods through both extreme and slow-onset events. Water disasters, such as floods and drought, increased frequency and intensity of extreme and unpredictable precipitation, have severe implications for our ecosystems, economies and societies. There is a need to address climate change through a water lens and to integrate water wise and climate resilient approaches in global development strategies. Pressures posed on land, freshwater and marine resources are exacerbated by negative effects of climate change (and vice versa) – and often closely interlinked by the hydrological cycle.

Resilience and disaster risk reduction are fundamental perspectives when creating sustainable development paths for urban and rural landscapes and communities. The key to successful development initiatives, with potential to sustain well beyond our generation, lies in realizing how responsible water management is linked to the preservation and restoration of healthy ecosystems for their buffering effects on disasters, and the use of sustainable energy sources enabling ambitious carbon emission reductions.

Of the world's megacities, 70 per cent are coastal and more than 80 per cent of total global wastewater is released into the environment without adequate treatment (WWAP, 2012; UN-Water

2015). As coastal cities are supporting the heavy demographic shift of urbanization and population growth, they need to adjust to increasing consumption patterns, water withdrawals and wastewater discharges. They are also responding to climate-related changes to rainfall patterns, sea-level rise, storm surges and risks of saltwater intrusion into coastal aquifers. Many deltas experience a “double squeeze” when sediments are trapped by upstream reservoirs resulting in delta starvation and erosion that is further exacerbated by sea level rise.

The small islands/big ocean states are among the most vulnerable to pressures from climate change and growing resource demands. Many of these pressures risk critical consequences as a result of their often vulnerable water and natural resources, relatively low agricultural capacity and unique infrastructure challenges, compounded by geographic remoteness.

Marine protection – pollution

The oceans are the end recipient of our waste; whether it is solid waste from plastic, micro-pollutants or liquid waste coming from sewages and wastewater due to agriculture, industries and domestic/city usages.

Solid and liquid pollution leads to a loss of biodiversity: 39 per cent of marine species and 25 per cent of corals are estimated to have already disappeared between 1970 and 2010. Micro-residues and microbeads of plastics or hormonal disruptors, are some of the main, but invisible causes of irreparable damages to the reproductive capacities of many species, and also contaminate the food chain. Unfortunately, these residues are often untreated in wastewaters.

The oceans produce 50 per cent of our oxygen. Increased sea level temperatures and water pollution are tempering this by destroying phytoplankton. Concurrently, oceans tend to absorb up to 30 per cent of CO₂ but this capacity has decreased by 10 per cent since 2004.

The discharge of untreated wastewater into seas and oceans partially explains why de-oxygenated dead zones are rapidly growing: an estimated 245,000 square kilometres of marine ecosystems are affected, impacting fisheries, livelihoods, and food chains (Corcoran et al., 2010). Therefore, creating marine protected areas and preventing the discharge of waste and polluted wastewaters into our seas are a matter of urgency.

NDCs of Pacific Island nations focus on securing freshwater

Climate change has put severe pressure on Pacific Island nations, causing losses and damages to land, water resources and biodiversity. The Nationally Determined Contributions (NDCs), submitted by the countries for the COP21 Paris Climate Agreement, illustrate that a majority of the island states in the South Pacific have ongoing adaptation projects to help increase resilience to the impacts of climate change at the global, regional and national levels.

Looking forward

As recognized by the international community, the need for integrated coastal and freshwater management is articulated in the Manila Declaration on Furthering the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, adopted by 65 countries in January 2012, which committed to “improve cooperation and coordination at all levels to deal with issues related to oceans, coasts, islands and their associated watersheds, by applying integrated management such as “ridge to reef” approaches, by involving stakeholders and developing innovative solutions to improve or resolve identified problems”.

In 2014, at the 69th session of the General Assembly, a text on Accelerated Modalities of Action for Small Island Developing States, known as the SAMOA Pathway, was adopted by consensus.

In 2015, SDG 14.2 calls for “By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans”.

At the UN Ocean Conference (5-7 June 2017) states were united through the declaration [Our Ocean, Our Future: Call for Action](#). The implementation of the Action plans should support countries’ in their efforts to reach the objectives set out in the 2030 SDG Agenda and the Paris Climate Agreement.

Sea walls to help Kiribati adapt

The Kiribati Adaptation Programme ran from 2012 to 2016. The first two phases – KAPI and KAPII – piloted a number of critical adaptation measures such as mangrove planting, construction of sea walls and rainwater harvesting. KAPIII sought to strengthen Kiribati’s ability to provide safe drinking water and maintain resilient coastal infrastructure. KAPIII improved water management by installing groundwater and roof rainwater harvesting systems. Thereby water leakages and waste in existing systems were reduced and water reserves protected, resulting in long-term planning for local water management, ensuring cleaner, safer drinking water.





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Examples of work, programmes, and projects

- The [Action Platform for Source-to-Sea Management](#) was established in response to the Manila Declaration to bridge the gap between land, water and marine management communities and to generate knowledge on integrated and innovative management approaches in the continuum from source to sea. Coordinated by SIWI, it aims to facilitate contact between decision-makers and experts to provide on-demand knowledge, support, advice and guidance to policy making and implementation on integration of freshwater, land, coast and sea. By doing so, it enhances the efforts of the international community to fulfill inter alia its commitments to the Manila Declaration and involves multiple stakeholders and sectors. The Alliance for Global Water Adaptation (AGWA) is a member of the Action Platform for Source-to-Sea Management.
- The [Pacific Islands National Priorities Multi-Focal Area 'Ridge-to-Reef' \(R2R\) programme](#), is a Global Environmental Fund programme lead by UNDP amongst other organizations. Its goal is to maintain and enhance ecosystem goods and services of Pacific Island countries through integrated approaches to land, water, forest, biodiversity and coastal resource management that contribute to poverty reduction, sustainable livelihoods and climate resilience. Activities include a series of national multi-focal R2R demonstration projects, supporting and addressing national priorities and development needs while delivering global environmental benefits in line with GEF focal areas. For example, Fiji's R2R project focuses on enhancing integrated management of a series of forested watersheds to protect land, water, forest and biodiversity resources, maintain carbon stocks, and protect coastal mangrove and coral reef with Marine Protected Areas (MPAs).

Recommendations

- Policy responses need to recognize the interdependencies between SDG 6, 11, 13 and 14. For instance, water use efficiency and minimized water pollution are necessary to achieve healthy oceans and a progress towards a sustainable development in a climate changing future. Approaching the whole SDG framework with a holistic, hydro-lens would allow for reinforced action, and build capacity to identify and allocate funding to balance trade-offs between different priorities.
- Integrated basin-scale management from source waters to coastal and estuarine and marine systems is essential to ensure that a full range of fresh and saltwater resources are provisioned and sustained. Agriculture, energy, fisheries, cities, infrastructure, and water abstraction and treatment must all be collectively engaged as stakeholders in planning, operations, and management.
- In many cases, these sectors will also span political boundaries within and between basins; integrated management should also operate to share data and decision making across these governance levels. Investments in governance processes and institutional capacity is therefore crucial to ensure informed, transparent, equitable and sustainable resource allocation decisions under critical scenarios.
- Since many aspects of climate impacts are uncertain, integrated freshwater-marine solutions should be robust (spanning a wide range of potential futures) and flexible (capable to responding to unexpected or alternative futures). Financing, engineering, science, and governance perspectives are critical and must be embedded in long-term decision making processes.
- Marine, riparian, and aquatic ecosystems provision critical adaptation and ecosystem services for communities and economies. Thus, these ecosystems should also be represented as stakeholders with explicit water allocations, such as environmental flows.

About this brief

This policy brief, prepared by SIWI and Alliance for Global Water Adaptation (AGWA), is a contribution to the discussions and activities at UNFCCC meetings and Conference of Parties (CoP) in order to improve understanding and application of water knowledge in the climate arena.

The Alliance for Global Water Adaptation (AGWA) and its member organizations stand committed to contribute to capacity building and support the integration and application of water knowledge in the climate mitigation and

adaptation activities. This includes providing guidance and recommendations on how water management can contribute to an efficient implementation of the NDCs.

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