

STAKEHOLDER DISCUSSION IN KIUNGA NATIONAL MARINE RESERVE:
JUNIOR WWF OFFICER IN DIALOUGE WITH SPOKESMAN OF FISHERS.
(PHOTO: G. HEMPEL)





Globally, the unsustainable use of freshwater and overfishing are the two most severe concerns in transboundary waters worldwide. Together with global climate change and pollution, they modify habitats and result in a loss of biodiversity. These water-related problems are amongst the most serious and immediate threats to humanity.

Although freshwater and marine issues differ greatly, they have mostly the same root causes like

poverty and population growth. The pressure on aquatic resources is increased further by poor governance, and market and policy failures. More dams, deeper wells and larger fishing fleets are not the answer; instead, the world's limited aquatic resources need to be shared and used wisely. Broad cooperation by a variety of stakeholders is an essential component of ecosystem-oriented management.

GIWA has focused on the transboundary nature and causes of the major aquatic concerns affecting Large Marine Ecosystems and international river basins, and developed potential options to address these concerns.

Conclusions

A number of globally relevant conclusions can be drawn from the GIWA regional assessments. GIWA has confirmed that transboundary pressures from human activity have weakened the ability of aquatic ecosystems to perform essential functions. The continued neglect of ecosystems and the inability to protect water resources are compromising human well-being and sustainable development. In general, the concerns are expected to increase in severity over the forthcoming decades, particularly freshwater shortage, pollution, and habitat modification in developing regions. Furthermore, global climate change will exacerbate the situation in many parts of the world.

Marine and freshwater systems are inextricably linked within the global hydrosphere. The transboundary consequences of human activities in freshwater systems are also felt in the coastal and marine environment, including changes in salinity and currents, sedimentation, eutrophication and toxic pollution. Although human marine activities affect freshwater systems less commonly, ocean processes impact coastal and even inland environments, and human well-being in various ways, e.g. by saline intrusion, storm surges and climate induced impacts.

GIWA confirmed that overfishing has the most adverse transboundary effects on marine ecosystems, while human-induced changes in water flow were considered to have the most severe transboundary impacts on freshwater ecosystems.

Challenges to international marine systems

The GIWA regional teams assessed three basic types of fisheries. In the shelf and enclosed seas of polar and temperate zones, a limited variety of demersal and pelagic fish species are harvested, most with a lifespan of several years. These stocks are extensively overfished, but could be restored by limiting catches and fishing effort (preferably as a precautionary measure). Climate driven regime shifts often conceal fishery-induced changes to stocks. The side-effects of the fisheries could be minimised by restricting destructive bottom trawling and through the introduction of regulations and selective technologies to reduce by-catch and discards. In many GIWA regions, international agreements and organisations have been established to improve fisheries management. However, the effectiveness of those measures is often hindered by weak enforcement and a lack of political will in the face of lobbying by the fisheries industry.

Upwelling regions, particularly the four large western boundary systems (the Benguela/44, California/26, Canary/41 and Humboldt/64 currents), are amongst the most productive fishing regions in the world. Local and international fishing fleets catch mainly small, short-lived pelagic fish. Fishing management must adapt precautionary regulations in response to massive climate driven fluctuations in fish stocks in these regions, for example, during ENSO events. The pelagic fisheries of upwelling regions have limited side-effects.

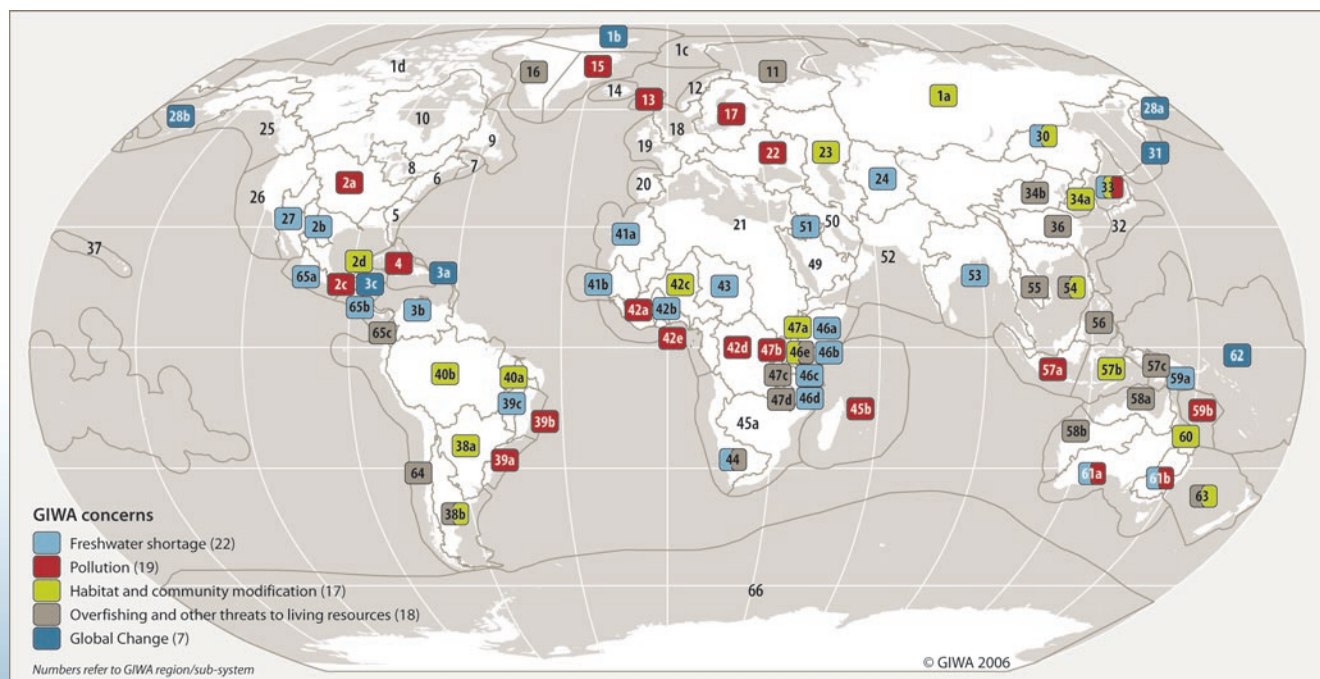


FIGURE 31. TOP PRIORITY CONCERNS BY GIWA REGION AND SUB-SYSTEM

NOTE: SEVERAL REGIONS AND SUB-SYSTEMS IDENTIFIED MORE THAN ONE TOP PRIORITY CONCERN.

In tropical and subtropical LMEs, small-scale, mostly artisanal fisheries exploit nearshore stocks, while industrialised fleets, often from overseas, operate offshore. They harvest a great variety of fish and other living resources using a broad range of fishing methods. In many GIWA regions these fisheries have severely depleted stocks which has led to 'fishing down the food web', where overfishing causes a trophic shift towards small, short-lived organisms lower in the food chain.

Ecosystem-based management can be achieved in many GIWA regions through the adoption of a variety of management instruments, including fleet reduction programmes, subsidy reforms, improved definition of rights, gear control, and closed seasons and areas. These measures, based on broad stakeholder involvement, aim to promote sustainability in the fisheries and to protect marine ecosystems.

Coastal habitats are not only degraded by the fisheries. Hypoxic (oxygen-depleted) zones in the marine environment were previously restricted to enclosed seas but are now observed in many coastal areas. Increased quantities of suspended sediment discharged by rivers or originating from coastal activities, such as construction and dredging, are degrading marine habitats, particularly coral reefs. In addition, nearshore habitats are modified by mariculture, oil and gas activities, wind parks and coastal development, including the construction of ports and tourist facilities. Mass coral bleaching, caused by water temperature increases, is considered the greatest threat to coral reefs on a global scale.

The creation of marine protected areas, zoning and bans can conserve sensitive habitats, such as coral reefs, mangroves and seagrass beds. In areas where human interference is unavoidable, policy measures which promote the adoption of sustainable practices were recommended by GIWA regional teams.

Although the transboundary impacts on marine ecosystems could be mitigated and controlled by present management instruments, political will and institutional capacity needs strengthening in most GIWA regions.

Challenges to international freshwater systems

The modification of stream flow by water infrastructure was the most severe and widespread transboundary impact affecting freshwater ecosystems. Dams fragment rivers and create a series of lakes and large reservoirs used for a variety of human uses, including drinking water, irrigation and the generation of hydroelectricity. Stream flow is also altered by the canalisation of meandering rivers to improve navigation.

Land-use change, including forest colonisation, urbanisation, draining of wetlands and irrigation of dry lands, modifies the drainage patterns and groundwater recharge rates of international river basins. In many GIWA regions, changes in the hydrological regime, resulting from both water impoundment and land-use change, have altered evaporation rates, the seasonal periodicity of flooding, erosion-accretion dynamics and the water table. These changes have adversely affected downstream habitats, particularly wetlands, and have subsequently reduced biodiversity and modified community structures.

Extensive soil and groundwater salinisation resulting from reduced freshwater availability, inappropriate irrigation practices and overabstraction of groundwater was reported in many GIWA regions. Toxic and microbial pollution are additional threats to freshwater systems.

On a global scale, freshwater shortage is the most severe aquatic concern. On all continents, the inhabitants of desert and semi-arid zones have strayed from their traditional path of sustainable water use and now overexploit their scarce surface and upper groundwater supplies. Inappropriate land-use management, inefficient use of freshwater by irrigation, evaporation from reservoirs, and greater water demand fuelled by the expansion of agriculture, as well as population and economic growth, have resulted in greater water scarcity and an increase in the frequency and duration of droughts. The overabstraction of fossil water from deep aquifers is increasingly common.

In the majority of arid and semi-arid regions, attempts to halt or reverse current degradation trends are constrained by: poverty and slow economic development; deficiencies in the technical, administrative and managerial capacity of institutions responsible for water management; weak national and regional legal frameworks; and a lack of international cooperation. In most GIWA regions, there is a need to increase the knowledge base regarding surface and ground water budgets and for a change in water policy from building new dams and deepening wells to conserving water through demand and efficiency management.

In the past, freshwater shortage has not been a concern in the humid zones of the higher latitudes and near the equator. Today, water is used unsustainably by large urban agglomerates and irrigated agriculture, resulting in water scarcity even in areas with substantial rainfall.

GIWA mega-regional trends

Considerable political and cultural differences exist between and within the GIWA mega-regions which affect the characteristics and relevance of the root causes for policy makers. The international waters of Sub-Saharan Africa are among the most degraded, particularly as a result of freshwater shortage. Incessant poverty and weak national legal frameworks and institutional capacity cause unsustainable development and constrain environmental management. In Southeast Asia, pollution and habitat modification have the most severe impacts. Increasing pressure on natural resources resulting from rapid economic growth is insufficiently controlled by the reform of relevant policies. In the former Soviet Union, water bodies were considered inexhaustible and to be infinite receptors of waste; a perception that will take a long time to change. Deficiencies in policy development and widespread corruption are impediments to habitat restoration, cleaner water and sustainable fisheries. In South and Central America, the overall environmental status of international waters seems of a higher quality than in other mega-regions. Nevertheless, pollution and habitat modification are relatively widespread but can be addressed through long-term natural resource planning, stronger political will and the strengthening of institutions responsible for environmental management and enforcement.

Cross-cutting root causes and management responses

Despite the above noted regional disparities, this global synthesis of the regional reports illustrates that the majority of the GIWA concerns have the same root causes: global climate change, population growth, migration to coastal areas, urbanisation, industrialisation, increasing economic pressures on resources, globalisation of trade and markets, and greater demand for water-intensive goods and services. These cross-cutting root causes are intrinsic elements of human societies. They cannot be resolved by simple policy interventions in the water sector alone but require concerted actions at all levels of national and international governance. The failure of global policy measures aimed at reducing the rate of global climate change demonstrates the difficulties in addressing these root causes.

Further root causes, such as market failures, institutional weaknesses, knowledge deficiencies, inappropriate subsidies and other unsustainable policy instruments, can be resolved by concerted action by all stakeholders in a given region. Even beyond regional boundaries. In the present era of globalisation,

many policy responses need to be initiated by the international community.

Pollution and the exploitation of water and aquatic living resources are often sufficiently regulated. However, enforcement and implementation can be weak due to a lack of awareness at all levels, weak institutions, inadequate technical and financial resources, negligence, bureaucracy and corruption. There is insufficient environmental monitoring in both developing and developed regions. Cooperative efforts for training and other forms of capacity building are needed on a regional basis, as well as through North-South partnerships.

The GIWA regional assessments, in accordance with other recent assessments, found that the complexity and diversity of transboundary systems require the integration of management across countries, sectors and ecosystems. Ecosystem-based management, including Integrated Coastal Zone Management (ICZM) and Integrated Water Resource Management (IWRM), offers the best path for advancing sustainable development. An ecosystem-based approach was called for at the World Summit on Sustainable Development (WSSD).

In contrast to traditional approaches that ignore issues which transcend limited sectoral interests, ecosystem-based management offers a framework for changing the practices of economic activities. The fishing industry, for example, has largely disregarded environmental warnings, opting instead for the blind hope that natural population recruitment will maintain the viability of the fisheries. Ecosystem-based management needs to be flexible and adaptive to the dynamic interactions of ecosystems and societies. The success of GEF LME projects has proven that an ecosystem-based approach can be implemented in widely differing regions.

GIWA, lessons learnt

Lessons can be learnt from the successes and weaknesses of GIWA. It has been the largest global assessment of a broad array of ecosystem-wide water issues from a transboundary perspective, holistically assessing international river basins and their adjacent LMEs. GIWA has prioritised and provided information on transboundary aquatic concerns so that regional and international policy makers and managers can better manage international waters.

GIWA's bottom-up approach was the project's greatest strength. Regional teams conducted the assessment based on existing regional data and information, and adapted the methodology to the local conditions. In many GIWA regions, the

assessment process has strengthened communication between social and natural scientists, as well as managers, providing the basis for long-term collaboration. It has also fostered transboundary cooperation and new partnerships within the regions and between neighbouring regions. GIWA not only assessed the available policy critical information, but also identified key knowledge gaps. GIWA's bottom-up approach resulted in strong local ownership of the GIWA regional reports.

In many regional teams, however, social scientists and policy specialists were underrepresented and stakeholder involvement was limited in several policy option analyses. Infor-

mation availability varied regionally and nationally, especially between developed and developing regions, which affected the accuracy and comparability of the results.

In future, the methodology should further incorporate the multitude of interactions between the various concerns and issues. Greater involvement of governments and various stakeholder groups would strengthen the causal chain and policy options analyses. It is essential to maintain close links with other assessment projects in order to avoid conflicting approaches and duplication of efforts, particularly in regions where scientific and technical expertise are limited.

(PHOTO: G. HEMPEL)

