KIUNGA NATIONAL MARINE RESERVE, KENYA

(PHOTO: G. HEMPEL)

Introduction

Only a small proportion of global freshwater can be used by humans for drinking, sanitation, agriculture and industry, as well as by the inland fisheries and aquaculture. The living resources exploited by marine fisheries and mariculture are predominantly restricted to the relatively narrow and shallow fringes of oceans. The various human activities increasingly compete for limited aquatic resources. The growth of human populations and their economies, urbanisation and the globalisation of trade, in combination with global climate change, will further increase this pressure.

Water and its resources are exploited at differing intensities and for various purposes in different parts of the world. Consequently, the impact of aquatic concerns, including freshwater shortage, pollution, habitat and community modification, and overfishing, vary in severity and extent. These concerns were traditionally assessed either on a national scale, individually on a global scale, or for a specific water body.

Many freshwater and coastal ecosystems are international; 263 river basins cross or delimit national borders, conveying about 60% of the world's freshwater flow and draining more than half the Earth's land area. Most Large Marine Ecosystems (LMEs) and large groundwater aquifers are shared by two or more countries. Downstream consequences of human activities can occur in regions some distance from the source of the problem. In order to address these water issues, they must be assessed from an international (or transboundary) perspective.

Over the past decade, the international community has increasingly acknowledged the need for a global approach to assessing transboundary aquatic resources and has recognised the importance of water for sustainable development. While aquatic environmental concerns are global issues, they are usually addressed on a regional scale, i.e. for each water system. Within the region, a holistic approach to assessment and management is required, as all aquatic concerns and their effects are interlinked and can be traced back to a number of common root causes.

The Global Environment Facility (GEF) has been established to inter alia "contribute primarily as a catalyst to the implementation of a more comprehensive, ecosystem-based approach to managing international waters and their drainage basins as a means to achieve global environmental benefits".

The absence of a worldwide comprehensive and integrated transboundary waters assessment has hampered the efforts of the GEF to meet its objective and to identify priority regions and issues for international support. Thus, the GEF commissioned UNEP to implement the Global International Waters Assessment (GIWA) project in order to develop a strategic framework that may be used by the GEF and its partners to identify priorities for remedial and mitigatory actions in international waters. See Annex I-III for further information on the GIWA project.

The GIWA project was executed by UNEP in partnership with the Government of Sweden, through the Swedish International Development Cooperation (SIDA). The Government of Finland later became a partner to the project. In 1999, they established the GIWA Core team at Kalmar University, Sweden.

GIWA focused on transboundary water issues in developing regions. However, in order to provide a more global coverage, comparable information was collated from regions containing developed countries that are not eligible for GEF interventions.

GIWA adopted a bottom-up approach involving regional experts. They evaluated the severity of transboundary ecological and societal impacts and their causes in international waters on a regional scale. The root causes, including global trends, policy, legislation, governance, institutional capacity and knowledge, were analysed by the experts. Finally, policy relevant conclusions were drawn from the assessments.

The GIWA project provides strategic information that can assist in meeting the Millennium Development Goals (MDGs), particularly for the eradication of hunger (Goal 1) and increased access to safe drinking water (Goal 7).

Project design

The transboundary regional approach to assessing global problems constitutes the backbone of GIWA. The inland water systems and shelf seas of the world were divided into 66 transboundary geographical regions, 41 of which are GEF-eligible. Each region comprises one or more international river basin and usually an adjacent LME. A few regions are landlocked, such as Lake Chad/43. Several regions were divided into sub-systems, which were assessed individually (see map on the inside of the front cover). The high seas were not assessed by GIWA.

The assessments were conducted by 1 500 scientists and administrative and managerial experts, who were organised into regional teams led by a focal point from the region. The multidisciplinary teams included representatives from each country in the region. The Core team was responsible for overall project management, methodology development, the coordination of the regional teams, and peer review and publication. The Core team, in cooperation with external experts, also produced this GIWA Final Report.

The GIWA assessment methodology

Globally comparable results were achieved by a common and consistent methodology applied by all of the regional teams. The GIWA methodology provides criteria for assessing water-related environmental concerns, and for identifying their immediate and root causes and potential policy options (see Annex II and III). Regional experts assessed and compared the severity of impacts from a regional perspective. The methodology was not developed for inter-regional comparisons of environmental quantitative data, such as pollutant concentrations or loss of mangroves. Instead, the GIWA determines regional priorities and allows a relative comparison of multiple impacts.

The numerous and complex transboundary water-related environmental problems were grouped into five major concerns:

1. Freshwater shortage
2. Pollution
3. Overfishing and other threats to aquatic living resources
4. Habitat and community modification
5. Global change

Global change largely causes impacts by affecting the four other concerns and many regional teams were unable to assess it due to a lack of data. Consequently, global change is integrated into the discussions on the other concerns in this report.

The GIWA methodology is comprised of four major steps (for further information and discussion on the GIWA methodology see Annex II, and for its theoretical background, Annex III):

Scaling defines the geographic boundaries of the GIWA region, which are generally demarcated by a large drainage basin and its adjacent marine areas. The boundaries of the marine parts of the GIWA regions often correspond with those of LMEs.

Scoping assesses and scores the severity of present and predicted environmental and socio-economic impacts caused by each of the GIWA concerns.

Causal chain analysis traces the cause and effect pathways from the socio-economic and environmental impacts back to their root causes.

Wherever possible, the causal chain analysis was followed by policy option analysis which outlined potential courses of action that aim to mitigate or resolve environmental and socio-economic problems in the region.

The GIWA provides baseline information at the regional level which will facilitate the preparation of Transboundary Diagnostic Analysis (TDAs) and Strategic Action Programmes initiated by GEF. At the same time, many GIWA regional assessments have benefited from completed TDAs.

The GIWA approach

Although GIWA is not the only assessment of the world's aquatic systems and resources, it has taken an original approach that will benefit a wide range of stakeholders. The number and diversity of regional experts, and the peer review process, has ensured transparency in the regional assessments. GIWA uses a holistic and ecosystem-orientated approach to assess the environmental and socio-economic impacts, and root causes behind environmental problems.

Traditionally, global assessments adopt a top-down approach; led by small teams of international experts with relatively limited inputs from local stakeholders. GIWA has

taken the opposite approach, with local experts leading each regional assessment, thus building strong local ownership of the GIWA regional reports. By facilitating international cooperation and fostering trust among scientists and policy makers from neighbouring countries, GIWA has strengthened national assessment capacity and provided the basis for long-term collaboration in developing regions.

Throughout the process of undertaking the regional assessments and preparing the regional reports, the training of many young scientists served to strengthen scientific capacity in specific regions. GIWA not only assessed the available policy relevant information, but also identified key knowledge gaps that need to be addressed.

In addition to their own knowledge, the regional experts drew, to varying extents, from complementary assessments and initiatives, including: the UN World Water Development Report; the Millennium Ecosystem Assessment; the Millennium Development Goals; the UN Commission on Sustainable Development; Food and Agriculture Organization assessments; and national studies. There is considerable overlap in membership of the various assessment groups and in the data sources used.

The GIWA methodology brought together natural and social scientists and resource managers, often for the first time, to participate in the workshops, conduct the assessment and compile the regional report.

Each GIWA regional assessment followed the same process. Training courses for the regional teams ensured that they all possessed a common understanding of the GIWA methodology.

The regional assessments are the primary outputs of the GIWA project. Fifty-five regional assessments have been completed, forty of which include GEF-eligible countries. The present status of the GIWA regional reports is presented on the map inside the front cover. The reports are also available on the GIWA website (www.giwa.net).

GIWA has been the largest global assessment of ecosystem-wide water issues from a transboundary perspective, linking international river basins to their adjacent LMEs. It was designed to provide policy makers and managers with the information they need to improve transboundary resources management.

The GIWA Final Report

This report provides a synoptic review of the most important information from the regional reports. It is a technical rather than a comprehensive scientific publication. Prime references can be found in the regional reports, which are referenced in this report by GIWA region (name followed by number, e.g. Mekong River/55).

The book:

- summarises the major transboundary concerns and their impacts;
- assesses the root causes of the impacts; and
- provides policy relevant conclusions.

The GIWA scoring matrices in Annex IV present the scoring results of the five concerns for each region and sub-system. The severity of the GIWA concerns and issues are expressed using the terms 'severe', 'moderate', 'slight' and 'no reported impact', which are described in Annex II. 'Environmental impacts' represent the average weighted score for the environmental issues associated with the concern. 'Overall impacts' refers to the concern's final score including environmental, socio-economic and the anticipated future impacts. The predicted trends of the environmental impacts are represented by arrows in the overall impacts column.

For various reasons, some regional reports have not been published and were therefore unavailable during the drafting of the Final Report. Many GEF non-eligible regions were not assessed, mainly in Europe and North America. Some areas of the Middle East and Southern Asia are also unrepresented. Those gaps may give a misleading impression that there are no transboundary water problems in these regions.

This synthesis of all concerns, their issues and impacts provides a global perspective on their relative importance. Readers are encouraged to consult the regional reports for more information about the examples contained in this report. The Annexes provide additional information on the GIWA project and methodology.