

Conclusions and recommendations

Probably the truest generality that can be made about the Benguela Current region is that it is characterised by high variability. This variability is evidenced in environmental processes such as rainfall and upwelling, but also in its highly variable socio-economic processes, with the highly industrialised Gauteng Province of South Africa contrasting dramatically with subsistence-based activities in Angola. This variability presents some challenges in attempts to assess the region as a whole, and where information has permitted these finer-scale differences have been enunciated in the body of this report. Despite the inherent variability, this report contributes a valuable synthesis of the major environmental issues within the region, and attempts to provide some insights into the impacts of these environmental perturbations on the socio-economic environment. It further attempts to elucidate the root causes of environmental issues and suggests possible policy options for addressing these.

Both the natural and human environments of the Benguela Current region are strongly influenced by the cold, northwards-flowing Benguela Current. This current and its attendant upwelling are not only responsible for the highly productive fisheries of the marine environment, but to a large extent controls the climate of the region. For the most part the region is arid or semi-arid, with low and highly variable rainfall. The growth of populations, coastal urban centres, irrigation agriculture and industry place increasing demands on limited supplies of water, to the extent that most parts of the region are currently considered to be suffering a water crisis. Sources of water for the most important permanent river basins in the region are shared between a number of countries, and in two cases (Orange River and Cunene River) the rivers themselves form national boundaries. The potential for conflict over water resources in the region is consequently high. For these reasons, Freshwater shortage was highlighted as a priority environmental and socio-economic concern. Many anthropogenic root causes combine to exacerbate the problems of the naturally low and

variable supply of freshwater in the region, including political decisions such as prioritisation of industrial water use, lack of coordination among departments, demographic considerations, economic policies, and improvements in technology, particularly irrigation technology. Three major thematic interventions are suggested to alleviate the problems of freshwater shortage in the region:

- Changing the way water is perceived and used. This revolves primarily around perceptions of the value of water as a life-sustaining resource at all levels of society.
- Effecting holistic water planning. Holistic, basin-wide planning is essential to effectively manage the limited supplies of water in the region.
- Improving existing management of water resources. Water management in the region could be greatly enhanced by strengthening and improving existing management at all levels, from policy to implementation to upgrading of supply equipment and introduction of water-conservation measures.

The Benguela Current is one of the most important upwelling systems on Earth. The high nutrient concentration of the upwelled water forms the basis of complex food chains which support highly productive fisheries. The continuous nature of the marine environment ensures that stocks of marine living resources are transboundary in nature, and are shared between the three coastal countries. Despite the high productivity of the Benguela Current, overfishing and the degradation of important habitats have led to declines in fish stocks in the system. In the case of inshore finfish, most stocks in this multi-species fishery are rated as overexploited or collapsed. Excessive fishing effort is a key contributor towards the decline in these stocks. Degradation of critical habitats such as estuaries and mangroves further compromises the resilience of these stocks to fishing pressure. Anthropogenic factors are at the root of the declines in stocks of inshore finfish, including those of political encouragement of small-scale fisheries, governance

failures and difficulty of regulation of inshore finfish fisheries, a number of economic considerations, improved capture technology, and poor voluntary compliance. Interventions around two major themes are offered as suggestions for alleviating the overexploitation of inshore finfish resources in the region:

- Reducing access. Although a contentious issue in the region, limitations on access to inshore finfish fisheries could be an important step in reducing overexploitation of these fisheries.
- Improved voluntary compliance. In this multi-user, open-access fishery spread over thousands of kilometres of coast, stringent enforcement of existing management measures is not practical. Long-term sustainable utilisation of these resources will require large improvements in voluntary compliance.

Interventions around three themes are suggested for reducing the degradation of critical inshore finfish habitats:

- Holistic management. Estuaries and mangroves are key habitats for inshore finfish. Recognition of their role as such, and the introduction of holistic ecosystem-wide management will assist in reducing degradation of these habitats.
- Creation of alternative economic activities. The use of destructive fishing practices and much of the destruction of critical habitats, such as mangroves, are the result of a lack of alternatives. The generation of alternative economic opportunities in coastal areas will reduce economic or livelihood reliance, and hence pressure, on coastal resources.
- Improving voluntary compliance. Existing legislation for the protection of environmental quality is often ineffective due to poor enforcement and a low level of voluntary compliance. Improved enforcement is not necessarily practical for a number of reasons, and long-term sustainability will be reliant on improvements in voluntary compliance.

A number of issues within these themes are currently being addressed by the Benguela Current Large Marine Ecosystem Project (BCLME), and will be the responsibility of the proposed Benguela Current Commission. The objectives of the BCLME are to improve the management of shared resources, and to implement an ecosystem approach to fisheries in the three coastal countries bordering the Benguela Current.

Reflecting the natural systems of the region, much variability also exists in the data, information and expertise available. Strong gradients are present in the distribution of data, information and capacity within the region, these generally decreasing from the south to the north. The text of this report reflects this, with much information available regarding the South African portion of the region, somewhat less concerning the Namibian portion and, not surprisingly after 30 years of civil war, far less regarding the Angolan component.

The quantity and quality of environmental data and information was not evenly spread across the concerns and issues. Data and information relating to specific pollution issues, specific habitats and ecosystems, and to global change issues were either not available, or very little was available. Surprisingly, environmental information was far more readily available than that relating to social and economic processes. The apparent paucity of socio-economic information and expertise does not, however, apply to the fields of social science and economics in their entirety, but rather as they relate to the natural environment. An important consideration in the pursuit of sustainable development will be the fostering of capacity in cross-cutting environmental social sciences and environmental economics.