

The role of multidisciplinary research programmes in the management of water resources*

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Abstract

The South African National Scientific Ecosystem Programmes, initiated in the early 1970s, were designed to provide a means by which multidisciplinary research could be co-ordinated in order to address specific complex environmental problems. Numerous aquatic ecosystem subprogrammes were co-ordinated by the Foundation for Research Development (FRD) under the auspices of the Inland Water Ecosystems Research Programme. This included studies of reservoirs (Hartbeespoort, PK le Roux, Wuras and Midmar), rivers (Pongola, Umgeni, Vaal) and wetlands. This paper presents an overview of several of these co-operative studies, discusses their overall impact on water resource management and also outlines some of the basic ingredients which are essential for any successful interinstitutional multidisciplinary co-operative research programme.

Introduction

The future prosperity of nations and individuals will depend on both the quality of the environment and the availability and utilisation of natural resources (World Resources Institute, 1987). Future health and well-being will depend on man's ability to direct environmental change and adapt to it when it comes (IUCN, 1989). Management of the environment requires three basic ingredients (Fig. 1):

- human capacity
- information
- technology

These ingredients can best be obtained by developing an appropriate education, research and management approach. In the mid 1970s the South African scientific community responded to this challenge by launching a series of multidisciplinary co-operative programmes (National Scientific Programmes) to address specific environmental problems (Huntley, 1987). These programmes were co-ordinated by a section within the CSIR which progressively evolved from being a small unit (Co-operative Scientific Programmes) to a larger well-structured foundation, the Foundation for Research Development (FRD). The National Scientific Ecosystem Programmes had, amongst others, sections on Inland Water Ecosystems, Terrestrial Ecosystems and Nature Conservation with the overall goal of developing a predictive understanding of the structure and functioning of South African ecosystems (Auret, 1986).

Accordingly, numerous research programmes were initiated, both on specific ecosystems (e.g. Nylsvlei, Midmar Dam, Hartbeespoort Dam, etc.), ecosystem types (e.g. wetlands, rivers, Karoo biome, etc.), or specific topics (e.g. endangered species, invasive biota, fire management, etc.). All were aimed at providing South Africa with a better scientific system on which to base environmental management decisions. In 1988, as a result of organisational restructuring within the CSIR, the FRD announced that it would be phasing out the National Scientific

Programmes and would phase in a new approach to its environmental programmes. This paper presents a statement on several of the aquatic ecosystem subprogrammes which were carried out under the auspices of the Inland Water Ecosystems Programme (IWE) and discusses their relevance and impact on water resource management.

Activities and approach of the National Scientific Ecosystem Programmes

The general approach taken by the National Scientific Ecosystem Programmes was to involve as wide a spectrum of scientists, decision-makers and resource managers as possible in both the conceptual development and operating activities of subprogrammes (Huntley, 1987). To achieve these objectives the FRD co-ordinated a network of committees which focused attention both on specific issues and problem ecosystems.

The National Ecosystem Programmes played a key role in initiating, stimulating and co-ordinating interaction between scientists at universities, museums and other research institutes as well as involving environmental user agencies and resource

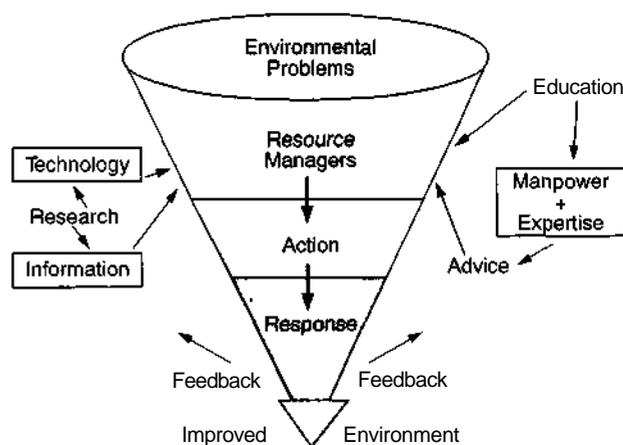


Figure 1

Schematic representation to illustrate the roles of human resources, technology, education, research and information in solving environmental problems

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