

An interactive and participative approach to water quality management in agro-rural watersheds

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Abstract

An interactive and participative approach to involve and mobilise rural communities in water quality control programmes was investigated. Agro-rural watersheds are experiencing serious environmental degradation mainly because of inappropriate land use practices due to various competing and opposing priorities in the community. The communities tend to concentrate on availability of land and water for their activities regardless of the state of that resource. The methodology is designed to bring awareness to the rural farmers of the amounts of pollutants they contribute to a river system and the benefits of adhering to good land-use and farming practices both in terms of production and environmental protection. It is based on a pilot project, dealing with an agro-rural watershed in a semi-arid developing area. A strong emphasis was put on stakeholder participation, an area neglected by many researchers. It became clear that pollutant flushes from the catchments are influenced by many factors, of which agricultural practices is only one.

Introduction

Most countries in the semi-arid Southern African region are facing difficult and severe environmental problems, which include degradation of water sources, soil erosion and destruction of natural ecosystems like wetlands. These problems cut across the various water use sectors including urban, industrial and mining, commercial and communal farming. The monitoring and control of these problems are well developed in most sectors. The communal sector, however, has been neglected; yet in many cases it contributes significantly to environmental degradation.

The major problems in the rural areas include overgrazing, siltation, poor agricultural practices and poor land management, emanating from technological, economical and socio-political problems, with numerous actors, differing goals and perceptions (Ongley 1998; Fedra 1984).

In the main the pollutants from rural settings tend to be of a diffuse nature and are difficult to identify, isolate or control (Hoffmann, 1994). In managing diffuse pollution, the focus should be on controlling the activities at source and along the delivery pathways to the receiving water, i.e. a source-directed approach based on best management practices. This requires readily available information and a high level of community participation.

However, in most parts of rural Southern Africa the following problems are common (Shela, 1993):

- Information is not readily available
- Literacy levels are low
- There is lack of adequate scientific understanding
- There is lack of public and political support
- Severe economic constraints are prevalent
- Policies and legal instruments are out-dated
- Institutional arrangements are poor.

All these factors make the management of diffuse pollution in the developing arid regions a challenging exercise. It calls for new approaches that are relevant, effective and sustainable, and that will increase effective decision-making in data-poor environments. Recognition of this need prompted the idea of investigating appropriate approaches for solving this problem.

The solution to diffuse pollution requires a comprehensive approach to water resources management. This approach recognises the river basin as the appropriate unit for managing water quality, quantity and ecosystem integrity (Duda, 1993). The river basin proposed for this study is the Muda River catchment, which forms the headwaters of the Sanyati catchment in Zimbabwe.

The main objective of this project was to investigate appropriate approaches for managing the water quality in the rural areas of developing semi-arid regions where various adversarial factors exist. This was done by focusing on effective community-based activities such as environmentally sustainable agricultural practices. This paper reports on the interactive and participative approaches that were implemented and the resulting effects on the environment. The effectiveness of the management options is measured both in economic and environmental terms: In economic terms by determining the gain or loss of yield due to the various alternatives and in environmental terms by determining the quality of the water being flushed from the sub watershed. Crowder et al. (1985) showed that farm income levels could be maintained by adopting conservation tillage practices or by crop rotation.

The study area

The Muda River catchment was chosen for this study because it represents a typical rural setting in a developing country, which is predominantly a farming area and exhibits little or no point sources of pollution. The catchment is situated in the Mupfure upper catchment between 18°17'S, 18°11'S and 30°59'E, 31°14'E. It covers an area of 206.26 km² and transverses part of Chiota Communal Lands in its upper part and passes through some small-scale commercial farms in its lower parts.

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