

Preface

The topic of water scarcity conjures the impression that it is a well trodden path, because so much has been written and many comments made on water deficits around the globe particularly in desert, arid and semi-arid landscapes and during droughts. However, water scarcity should be distinguished from aridity because water scarcity describes the situation where the available water quantities are inadequate to meet normal activities even in areas outside arid areas and deserts. Water scarcity can be caused by mismanagement of available water so that it is not available to users; mismanagement that ruins potable water so that it is unusable. Water scarcity is a relative concept and can occur at any level of supply or demand. Water scarcity fluctuates over time and space; it is a function of supply and demand both sides of the equation being shaped by social set up, political choices and public policies of any given country.

While aridity cannot be reversed, water scarcity can be reversed through manipulation of water potability through wise usage and improved management of the available water, management that increases access and prevents pollution or excessive losses through evaporation. The approach used in this book is to bring to the fore how Southern Africa region has embarked on interventions that address this aspect of water scarcity.

The first chapter is a backdrop of the theme of water scarcity reviewing its historical considerations since the 1992 Earth Summit in Rio de Janeiro, Brazil to the World Summit on Sustainable Development, 2002 in Johannesburg, South Africa and the recent Rio+20 United Nations Conference on Sustainable Development that took place during June 2012 again in Rio de Janeiro, Brazil quoting principles and agreements reached during and after the conferences.

The second chapter on managing water scarcity in Southern Africa looks at the Southern Africa region's efforts to combat water scarcity including principles, policies and strategies put in place to guide the Member States in overcoming challenges arising from water scarcity. Each member state was tasked with the responsibility of implementing these principles. Namibia, in her quest to meet this responsibility, has forged ahead with various undertakings to ensure management of the scarce resource. Over and above instituting water law and regulations pertaining to water management and pollution control and raising awareness of the general public, Namibia encourages relevant research to ensure the attainment of the requirements of both the SADC Protocol and her own national legal

instruments governing water scarcity management. The case studies included in this book shed light on how Namibia is addressing some relevant water pollution issues that could reduce the availability of potable water.

The third chapter is a case study on Calueque-Oshakati canal in north-central Namibia. It examines trends and impacts of pollution on water treatment. It presents the results of a study carried out to assess the trends of pollution in the canal and the impacts of pollution on the water treatment processes at four water treatment plants abstracting raw water from the canal. The parameters studied include turbidity, pH, hardness, sodium, total dissolved solids, total nitrogen and *E. coli*. The effect of turbidity and pH on water treatment chemical requirements was also investigated.

The fourth chapter presents research findings of a study on monitoring the effects of anthropogenic activities on water quality of Von Bach Dam in central Namibia. The study examined effects of human activities on the quality of water flowing into Von Bach Dam, the water in the dam as well as water flowing out of the dam during different seasons. The study involved bacteriological testing, turbidity determination and temperature variation within the water body as well as dissolved oxygen content and pH levels.

The fifth chapter on the effects of water transfers from Swakoppoort and Omatako Dams on the water quality of Von Bach Dam presents the outcome of research on the effects of water transferred from two storage dams to augment water quantity in the supply dam. The transfers are made to combat water scarcity in the area by boosting water required for domestic and industrial water supply in central Namibia including Windhoek, Namibia's capital city. Globally, the relevant literature and relevant models for the analysis and prediction of effects of inter-basin water transfers on water quality are reviewed and used in the analysis of the research findings.

The sixth and final chapter contains summaries of the issues discussed in the preceding chapters highlighting drawn conclusions and recommendations put forward in each chapter. A few additional examples from within the Southern Africa region are commented on to further strengthen raised issues including inter-basin water transfer; dam construction; groundwater recharge; rain water harvesting; water recycling and water reuse as well as economical irrigation methods such as drip irrigation.

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Combating Water Scarcity in Southern Africa
Case Studies from Namibia

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2014, IX, 130 p. 44 illus., 37 illus. in color., Softcover

ISBN: 978-94-007-7096-6