

# GUIDELINES OF LAKE MANAGEMENT

Volume 1

## Principles of Lake Management

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## FOREWORD

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This book has been written as an attempt to explain the concept of Environmentally Sound Management and Development of Lakes. Our lives depend on both natural lakes and artificial reservoirs because they provide drinking water for millions, water for agricultural and industrial development and they provide unique recreational opportunities.

Many problems, however, arise from the process of development itself. Agricultural growth together with the construction of irrigation and drainage systems, the cleaning of forests, the building of factories and the use of fertilizers and pesticides - all may cause environmental damage to the lakes and lake basins; An advanced stage of lake eutrophication is virtually irreversible; Consequently environmental problems relevant to the lake regime need to be solved at a very early stage.

Management of lakes should be considered as a component of sustainable development of any country. Efforts to manage lakes and their watersheds in an environmentally sound way form an important part of the activities of United Nations Environment Programme. Nationally adapted and locally appropriate policies and guidelines for the environmentally sound management of the lakes are needed everywhere.

For their implementation this comprehensive book will hopefully form a relevant working framework; nevertheless the dedication of a limnologist who wrote it will amount to nothing unless the conclusions are ultimately translated into hard concrete action at individual lakes.

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of U.N.E.P. concerning the legal status of any country, territory, city or area of its authorities, or concerning the delimitations of its frontiers or boundaries.

## FOREWORD

The traditional friendly relationship between lakes and humankind, is now being jeopardized by unbalanced development of our civilization. Due to the misuse of surrounding lands the increased sediment inflow has filled a large number of natural and man-made lakes to the extent of completely diminishing their utility value. Toxic chemicals produced or used in watersheds have contaminated lake water, bottom sediments and fishery products and endamaged the use of these resources. Nutrients contained in industrial, agricultural and domestic wastewaters have caused the eutrophication of lake water, completely changing of the aquatic ecosystems by the explosive overgrowth of planktonic and other plants and degrading the quality of the water we use. The acid rain, which is a result of accelerated air pollution with oxides of sulphur and nitrogen, has also been an important factor leading to the drastic decline of lake productivity in certain parts of the world.

This degradation of lake environments and resources is now a world-wide issue. Efforts urgently have to be made to restore the friendly coexistence of lakes and humankind through appropriate management of lake/watershed systems to assure the sustainable use of their resources.

In view of the scarcity of international bodies devoted to this specific issue, the International Lake Environment Committee (ILEC) was founded as a non-governmental organization of scientific and managerial experts aiming at contributing to the promotion of environmentally sound management of lakes and their resources through intellectual non-profit activities. ILEC initiated its operation in 1986 in close cooperation with international agencies such as the UN Environment Programme, the UN Centre for Regional Development, the International Society of Pure and Applied Limnology, etc., as well as the government of Shiga Prefecture, Japan, and other governmental and non-governmental bodies. At its foundation it was a voluntary organization, but was later reorganized as a juridical corporation providing the original committee the status as its Scientific Committee. The ILEC's activities are currently concentrated on the four following subjects: the preparation of guideline books on reasonable lake management principles, the compilation of world lake environment data, the promotion of relevant training courses and workshops, the provision of support to the Conference on the Conservation and Management of World Lake Environment which has been and will be held biennially since 1984.

The members of ILEC Scientific Committee are very pleased to see the publication of this book as the initial output of the Joint UNEP/ILEP Project, *"Promotion of Environmentally Sound Management of Lakes"*, which includes the first and third subjects of ILEC's activities. We should be very pleased if this book proves useful for decision makers, development planners and environment managers of the world, particularly in developing countries.

Representing ILEC in expressing its heartfelt thanks to Dr. Mostafa Tolba, Executive Director, and other staff of UNEP for their continuous encouragement and support to the present publication programme.

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Otsu, Shiga

Tatuo Kira  
Chairman  
Scientific Committee of ILEC

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