

WATER TREATMENT PROCESSES

Simple Options



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Preface

Water is essential for human life. Its quantity and quality are equally crucial. However, natural waters are in most cases not aesthetically nor hygienically fit to be consumed directly, thus calling for some means of treatment.

The United Nations-sponsored water decade program (1981–1990) enabled many developing countries to adopt appropriate water treatment facilities, thus providing adequate quantities of safe water to their ever-increasing populations. During the same period, the potable water treatment and distribution sector has seen notable technical developments. Parallel to this progress, environmental science and engineering activities have also flourished. Many national universities have developed comprehensive undergraduate and postgraduate programs in environmental science and engineering. Drinking water treatment and supply is one of the key fields of study in such programs.

From the environmental engineering point of view, drinking water supply activities can be broadly divided into two groups: water distribution and water treatment. The former basically deals with the hydraulics of water conveyance from source to the treatment plant and the distribution of purified water to consumers. This field is still largely taught as part of the traditional civil engineering program. The literature in this field is extensive, and a great variety of computer software is also available.

This book therefore considers the latter type. In this field, the available books are concerned mainly with the theoretical concepts and the design of conventional and/or advanced treatment technologies. Very little emphasis has been given so far to low-cost or simple treatment technologies. The main objective of this book, therefore, is to bridge the gap, by discussing both conventional and simple treatment options.

Most of the water treatment technologies practiced in both developed and developing countries look simple but attention must be given to their cost and appropriateness. Technologies such as membrane filtration are certainly very effective but at present the cost involved is prohibitive. Therefore, when selecting a treatment technology, the appropriateness and the economy of the technology must be an integral part of the selection process.

It has become a standard practice in the small community water supply schemes to look for a treatment option which already exists. They are easily tempted by the glamour of hi-tech alternatives without considering the operation and maintenance complications that follow.

Quite a number of low-cost, appropriate treatment alternatives have been tried and tested in small community water supplies. Countries like Brazil, China, and India have developed several treatment techniques (traditional¹ and non-conventional²) which are extensively used.

¹ Traditional techniques: Techniques commonly used. Example, rectangular sedimentation tank, slow sand filter, baffle type flocculator.

² Non-conventional techniques: Techniques not commonly used but developed to suit the local situation. Example, inline blenders, Alabama type flocculator, tube settlers.

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