

FOREWORD

Everyday we are bombarded by the media with tales of gloom and doom – we are running out of water, petroleum, open space, clean air, arable land, etc. While there is good reason to be wary of some of the potential outcomes of these prognostications, the reader should be encouraged to remember that *forecasts* are not *destiny*. The human race has an uncanny knack of proving the doomsayers wrong. This certainly goes back at least as far as the 18th century of Malthus and his gloomy predications of widespread famine unless there were wars and epidemics to curb the natural growth of population. To be sure, there have been many wars and epidemics since Malthus's time, too many, nevertheless the population of the globe continued its giddy increase. The outcome is that 200 years after Malthus, the population has increased several-fold and enjoys greater longevity and health than it enjoyed in his times. Of course, there are more poor people on the globe today than the total population at Malthus's time; that is bad, but there are also many more people who would be considered to be *living like kings* in Malthus's time. Is this good? Both poverty and affluence stress the environment in ways that Malthus could never have envisaged. This book is about fresh water and asks the question: is the impending global shortage of water reality or myth?

Water is a classic *renewable resource*, that is one that will cycle continuously regardless of ice ages and global warming. It is pretty much in a fixed amount on our small planet. What is at stake is the allocation of this amount of water among potential users. For example, before *homo sapiens* roamed the globe, water use was 100% for the ecosystem. As mankind grew and prospered we started to make inroads in this exclusive use of water by the ecosystem, but here was plenty of water to go around for millennia. It took maybe a hundred thousand years before *homo sapiens* demanded, and took, a significant amount of water from nature. This was when agriculture became settled and we began to develop irrigated agriculture in the Fertile Crescent and in China. Settled agriculture allowed a rapid increase in human populations which continually demanded more and more water from nature's account. Seven thousand years brings us up to the present when the largest human demand for water comes from irrigation systems worldwide. As much as 70–90% of all the water consumed on an annual basis is used by irrigated agriculture. This is why so much of the *running-out-of-water* stories are based upon the facts that in many parts of the world the rivers are running dry and the groundwater is over-pumped to provide irrigation for feeding the world's population. Surely, this is a sign of a Global Water Crisis? Because if we are unable to feed ourselves, then Malthusian constraints will take over with disastrous consequences for *homo sapiens* and for the planet.

In addition, the rate at which water sources are becoming contaminated with waste from humans, industry, and agriculture is truly alarming. Human ingenuity is busily creating tens of thousands of new chemicals that ultimately find their way into our drinking water supplies. More than one million three hundred thousand children under the age of four die each year due to diarrhoeal diseases and another one million due to malaria, both largely caused by water supply and management deficiencies. Global climate change is predicted by some to have major impacts upon the availability, spatial distribution, and the variability of water supplies during the next century.

This litany of disasters can make even the most stouthearted falter. This volume attempts to examine these issues and tries to unravel from them what is permanent and unchangeable and what is remediable and changeable. On close examination of the problems we find that there is much to be hopeful about the global water situation. To be sure, there will be places on the globe that will be condemned to permanent water shortages and crises, but these are only a small part of the problems. We find that if the policy prescriptions outlined in these chapters are taken into account the Global Water Crisis can be dealt with over a fairly short time scale.

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