



Preface

This book springs from my strong conviction that clean water and clean energy are the critical elements of long-term global sustainable development. I also believe that we are experiencing the beginning of an energy revolution in these early years of the 21st century. Providing clean water requires energy, and providing clean energy is essential to reducing the environmental impacts of energy production and use. Thus, I see a nexus – a connection, a causal link – among water, energy, and environment. In recent years we have adopted the terminology of the water-energy nexus for the intimate relationship between water and energy, and similarly we can apply the term nexus to the close connections among water, energy, and environment. This use of the term nexus can be, and has been, extended to include the related issues of food production and health. Dealing with, and writing about, a two-element nexus is difficult enough. In this book, I will limit my analysis and discussion to the three-element water-energy-environment nexus and leave the discussion of other possible nexus elements to those more qualified to comment.

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This book also springs from my observation that while there are many existing books of a more-or-less technical nature on the three elements of this nexus, a book addressing each of them and their interdependencies in a college-level primer for a broad global and multidisciplinary audience would be valuable. Consideration of these and related issues, and options for addressing them, will be priorities for all levels of government. They will also be priorities for many levels of the private sector in the decades ahead, both in developing and developed nations. A handbook-style primer that provides an easily read and informative introduction to, and overview of, these issues will contribute broadly to public education. It will assist governments and firms in carrying out their responsibilities to provide needed services and goods in a sustainable manner, and help to encourage young people to enter these fields. It will serve as an excellent mechanism for exposure of experts in other fields to the issues associated with the water-energy-environment nexus. Further, in addition to the audiences mentioned above, target audiences include economists and others in the finance communities who will analyze and provide the needed investment funds, and those in the development community responsible for planning and delivering services to underserved populations.

The book is organized as follows: the first chapter will be devoted to the concept of nexus and how the three elements, water, energy, and environment, are inextricably linked. This recognition leads to the conclusion that if society is to optimize their contributions to human and planetary welfare they must be addressed jointly. No longer must policy for each of these elements be considered in its own silo. Chapters 2 and 3 will be devoted to spelling out global contexts for water and energy issues, respectively. Chapter 4, on related environmental issues, will address the issues of water contamination, oil spills, fracking, radioactive waste storage, and global warming/ climate change. Chapter 5 will be a discussion of energy efficiency – i.e., the wise use of energy – and its role in limiting energy demand and its associated benefits. Chapter 6 will focus on the basics of fossil fuels – coal, oil, natural gas – which today dominate global energy demand. Chapter 7 will discuss nuclear-fission-powered electricity production, which today accounts for 10% of global electricity. It will also discuss the prospects for controlled nuclear fusion. Chapter 8 will

discuss the broad range of renewable energy technologies – wind, solar, hydropower, biomass, geothermal, ocean energy – which are the basis of the now rapidly emerging energy revolution. Chapter 9 will discuss the closely related issue of energy storage. Finally, Chapter 10 will address policy issues associated with water, energy, and environment, discuss policy history and options, and provide recommendations.

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