

# Preface

Since the problem of natural resource depletion and the economic development is at the crossroad of sustainability, how to efficiently and reasonably exploit and use the limited resources to sustain the balance has become an urgent governmental and scientific topic related to the entire human society and natural ecosystems. In the former researches, hydrological models are mainly used to explore reasonable water management, considering water as a natural element rather than a social-economic one. However, the social function of water should be taken into consideration seriously when policy makers look forward to construct an integrated management system. The purpose of this work is to propose a conceptual framework of regional input–output table compilation at regional level and introduce how to incorporate the Computable General Equilibrium (CGE) model into integrated water management research to explore a more sensible and optimal method to implement sustainable development for the river basin.

Establishing multiscale optimal water resources allocation modes which takes the enhancement of utilization efficiency as core is a research hotspot for the international water resources management of river basins. From the perspective of data integration which serves the management of water resources, this work aims to introduce how to compile the first set of regional level integrated IO tables involving resources and environment accounts with integrated datasets which contains the spatio-temporal data of water and land resources, ecology, and social economy in the river basin, and how to construct an integrated CGE model with resources and environment accounts embedded, which can be used to quantitatively depict the key process parameters of the water-ecology-social economy coupling system. Thus, this work can provide decision support for integrated river basin management, and scientific support for the sustainable development of social economy, eco-environment, and water resources.

Theories and methods to address this issue are supposed to distinguish and analyze the interrelationship and mechanisms within these complex systems. Among which the input–output analysis is an economic method for analyzing the interdependence of an economy's various productive sectors by regarding the product of a particular industry both as a commodity demanded for final consumption and as a factor input in the production processes of itself and other sectors. Input–output tables, as the core of input–output analysis, can be constructed for the whole or segmented economies in planning the production levels to

meet the consumption demand and in modeling the impacts of economic activities such as component changings.

An overview analysis of existing challenges and opportunities in certain resource-restricted areas associated with the integrated management finds out that there is considerable potential for regional green development as well as various severe issues need to be addressed. The conceptual framework is mainly focused on two natural resources including the water and land resources. How to construct an integrated CGE model is explained and the implementation of an integrated CGE model with TABLO language is displayed. The integrated CGE model can be used as a tool in the analysis for enhancing the resource security in particular regions such as inland river basin and resource-restricted developing areas. This work can also provide insight into bridging the gap between national and small regional input–output analysis.

Several chapters and sections include concrete examples. More assistance from the relevant literatures can also be found in the references at the end of the document.

The authors claim full responsibility for any errors appearing in this work.

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