Preface

The population of cities around the world is growing at an alarming pace, and as a result the landscapes of most cities are undergoing phenomenal changes. Consequently, fertile agricultural lands on the periphery of cities are being converted into non-agricultural use without consideration of holistic planning. Peri-urban areas, zones of transition from rural to urban land uses located between the outer limits of the urban and the rural environment, are experiencing significant losses of agricultural land, increased runoff and degradation of water quality. Concurrently, demands for water, food and energy are increasing within cities, and unless a balance is struck the liveability of these cities will soon be compromised.

The current water and land-use changes have serious consequences for lifestyle, environment, health and the overall well-being of urban communities. It is therefore important for policy makers, urban and peri-urban planners and municipal council managers to understand the current issues and challenges in order to develop suitable strategies and practices to cope with current and future pressures of urbanisation and peri-urban land-use changes. This constituted the motivation for the book which examines a number of critical aspects in relation to the future of cities and peri-urban regions, including the suitability of policies and institutions to sustain cities into the future; impact of current trends on land-use change, population increase and water demand; long-term planning needs and approaches to ensure the secured future for generations ahead; and strategies to adapt the cities and land uses so that they remain viable and liveable.

The subject matter of the book is divided into six parts. Part I comprising two chapters is introductory. Discussing the challenges and opportunities for the future of peri-urban areas, Chaps. 1 and 2 argue that sustainable planning strategies are fundamental to the development of a sound urban transformation policy, and the modelling of the whole water cycle is critical to the policy for integrated urban water management.

Part II contains five chapters that deal with different aspects of urbanisation. Chapter 3 discusses the geo-social dynamics of the assimilation of rural–urban spatial fringe and the geo-social buffer zones forming the basis for the development of peri-urban areas and the strategies for their betterment. Chapter 4 discusses the liveability of future cities, Chap. 5 the impact of expanding urban fringe on peri-urban areas, Chap. 6 challenges in urban and peri-urban transition zones and strategies for sustainable cities and Chap. 7 management of threats and opportunities of urbanisation for urban and peri-urban agriculture.

Water and energy constitute the subject matter of Part III containing five chapters. Chapter 8 examines how urbanisation impacts on water demand, food security and energy need, while Chap. 9 deals with urban water footprint and peri-urban interface. Chapter 10 is about the analysis of water use, demand and availability; Chap. 11 stormwater reuse for sustainable cities; and Chap. 12 the role of solar energy in urban and peri-urban areas for improving the liveability of cities.

Wastewater is the topic of Part IV comprising three chapters. Chapter 13 renewable energy policies for reducing the carbon footprint; Chap. 14 deals with perspectives on urban sanitation, liveability and peri-urban futures; and Chap. 15 decentralised wastewater management for improving sanitation.

Part V is on urban agriculture. It has nine chapters. Chapter 16 the construction of wastewater treatment capacities for relief for peri-urban farmers; Chap. 17 treats the response to food supply crisis; Chap. 18 the assessment of the importance of the city's peri-urban farms; Chap. 19 comparison of urban, peri-urban and rural food flows; and Chap. 20 examines the sustenance of agriculture around cities. Chapter 21 is about the protection of horticulture in peri-urban areas, while Chap. 22 urban and peri-urban dairy production. Chapter 23 examines recycling excreta form peri-urban agriculture; and Chapt. 24 the nutrient recycling from organic wastes in peri-urban areas through viable business models.

Part VI deals with several aspects of peri-urban development, including global warming and climate change, landscape and ecosystems and governance. Chapter 25 the effects of labour migration and land-use changes on food production. Chapter 26 discusses the assessment of knowledge of climate change and urban and peri-urban agriculture, Chap. 27 greenhouse gas emissions of decentralised water supply strategies in peri-urban areas, and Chap. 28 coping with the effect of climate change on urban and peri-urban agriculture.

The next three chapters deal with landscape transformation and impact on the ecosystem. Chapter 29 examines system harmonisation approach for landscape changes and water planning, while Chap. 30 discusses the maintenance of landscape functionality under land-use change. The importance of urban biodiversity is discussed in Chap. 31 and water and biodiversity issues are in Chap. 32.

The aspects of governance in peri-urban landscape are covered in the next three chapters. Chapter 33 discusses the development of law and governance strategies for peri-urban sustainability, Chap. 34 the governance for extreme events in peri-urban areas and Chap. 35 the valuing of water for use in peri-urban areas. Finally, the key points of all the chapters are summarised in Chap. 36.

It is hoped that the book will be useful to policy makers, urban and peri-urban planners and municipal council managers as well as researchers, consultants and postgraduate students of water and land use-planning, environmental management and sustainability aspects.

Basant Maheshwari
Ramesh Purohit
Hector Malano
Vijay P. Singh
Priyanie Amerasinghe

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