

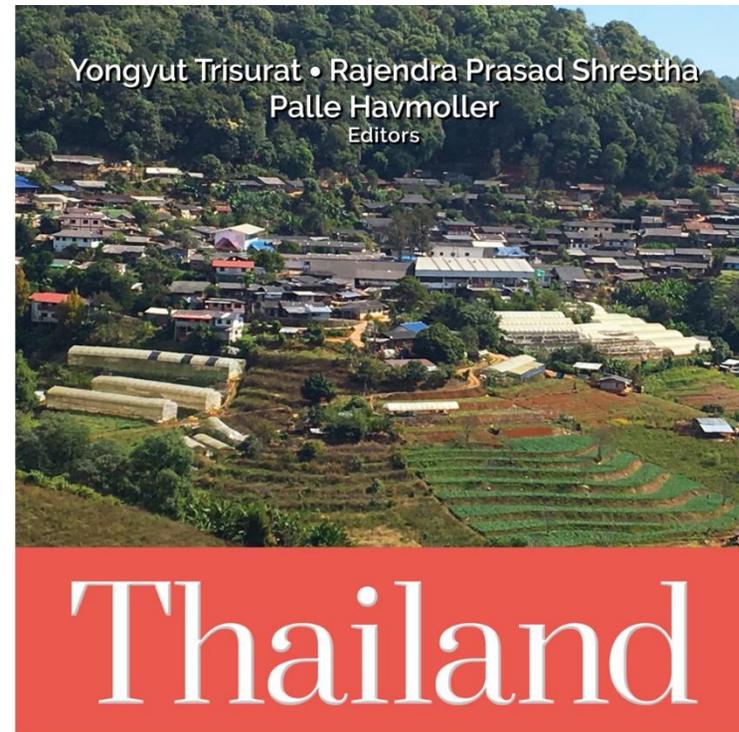
Thailand has been recognized as having rich natural resources, the natural capital to support the country's economic development and the livelihood of Thai people. Tapping on its vast fertile area, the country has been one of the players in global food production for last four decades. However, these achievements have also had negative consequences on biodiversity, ecosystem functions, and human health both in rural and urban areas.

*Thailand: Environmental Resources, Social Issues, and Related Policies* reviews the pressures, impacts and status of selected natural resources and environmental concerns, e.g., forest resources, coastal and marine resources, protected areas and biodiversity, soil and land resources, water resources, energy and climate change, and economic instruments and modeling tools for enhancing management planning through various contributed chapters that are organized into five sections: Section One: Setting the Scene; Section Two: Physical Environment and Natural Resources; Section Three: Governance and Management; Section Four: Global Initiatives and Economic Tools; and Section Five: Conclusions and Recommendations. In addition, the concepts and lessons learned from case studies presented in this book do not only provide the analytical review status, but also identify key issues and management options for achieving the designated national goals and international commitments on biodiversity conservation and the United Nation's Sustainable Development Goals (SDGs) 2030.

It is hoped that this book will be of value in terms of the necessary inputs to effectively support the implementation of the Thai government's initiatives on moving the country towards "Thailand 4.0" or a "value-based economy", as well as the recent 20-year National Strategic Plan (2017-2036). The contents and materials will also be of interest to individual scientists, stakeholders, practitioners and policy-makers working for the cause of natural resources and environmental, management and sustainable development in Thailand and beyond.



Thailand • Trisurat et al.



Yongyut Trisurat • Rajendra Prasad Shrestha  
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Editors

# Thailand

## Environmental Resources, Social Issues, and Related Policies

ASIAN POLITICAL, ECONOMIC AND SOCIAL ISSUES

NOVA

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## PREFACE

Thailand has been recognized as having one of the highest potentials for economic development among the countries of Southeast Asia. In the last four decades, the country has been rapidly transforming from an agricultural-based economy towards an industrial economy. Economic growth and urbanization have helped lift millions of people out of poverty to middle class with improved access to basic services. However, these achievements have also had negative consequences on natural capital, biodiversity, ecosystem functions, and human health. There is also growing economic inequalities and disparity in regional economic growth. The 1997 financial crisis known as “*Tom Yum Kung Syndrome*” has had a significant influence on the country’s natural resources and the quality of life of its citizens both in the rural and urban areas. Forest cover of the country has declined by more than 50% during 1961-1999 and more than 40% of vertebrate species are listed as threatened species and have a high risk of extinction.

Recently, Thailand is gearing towards “*Thailand 4.0*” or an innovative and value-based economy aiming to deal effectively with disparities and the imbalance between the environment and society. Thailand’s 1997 constitution and the 2017 constitution have changed the paradigm of natural resources and environmental management in Thailand from centralized administration to decentralization by encouraging more participation at all levels, and increasing the involvement of private sectors for Corporate Social Responsibility (CSR) activities. Nevertheless, Thailand is facing several critical trends, which include 1) changing demography, lifestyles and access to basic services, 2) increasing inefficiency in the use of resources, 3) increasing vulnerability to the impacts of natural hazard and extreme events, 4) increasing environmentally related health risks, and 5) widening gaps between the rich and the poor, including middle income trap. These environmental effects and their consequences on social and economic aspects are thus unavoidable unless proper planning, and timely and appropriate mitigation actions and ancillary policies are effectively implemented.

This book entitled “*Thailand: Environmental Resources, Social Issues and Related Policies*” aims at reviewing the past and current status of selected natural resources and environment concerns, e.g., forest resources, coastal and marine resources, protected areas and biodiversity, soil and land resources, water resources, energy and climate change, economic instruments and modeling tools for environmental management, and identifying key management issues and policy options in order to safeguard natural resources in the midst of rapid, dynamic anthropogenic and environmental changes. This book follows on previous works on Thailand, i.e.: National Resources Profile published in 1988 (eds. A. Arbhahirama, D. Phantumvanit, J. Elkington and P. Ingkasuwan) and Thailand Environmental Performance Assessment report jointly published by Department of Environmental Quality Promotion and the GMS/ADB Environmental Operation Center in 2008 where Y. Trisurat and S. Satumanatpan were the main contributors.

This book contains 17 chapters in five sections. In *Section One: Setting the Scene, Chapter 1 (Social and Policy Context of Environmental Resources in Thailand)* provides a coherent presentation of geographical location of Thailand, its uniqueness and role in Asia, environment and natural resources profiles (forest resources, coastal and marine resources, protected areas and biodiversity, water resources, land degradation, climate change) and historical background of relevant policies and management measures. The chapter raises some key environmental concerns in the face of political, social and economic changes and the consequences of altered environmental changes on ecosystem services and human well-being.

*Section Two: Physical Environment and Natural Resources* presents the overview of environment and natural resources in Thailand. Each of eight chapters in this section chapter covers the drivers, pressures, state and policy responses related to different natural and environmental resources. *Chapter 2 (Socio-economic Drivers to Land Use/Land Cover Change in Nan Province, Thailand)* reviews and describes past, present and future land use/land cover in Nan province based on different socio-economic scenarios by 2030. Using a spatially explicit land allocation model (CLUEs) projects the future land-use/land-cover patterns in Nan province in northern Thailand, the study area as a proxy for forest and land-use/land cover management in Thailand because of political and public concern. The province had 74% of forest cover in 2004 and declined to 61% in 2016. The current cover is greater than the national average of 31.5% as the more than 70% of province is classified as headwatershed and slope complex. Despite slope complex has to be protected for forest by law, deforestation issue is becoming more severe nowadays and future climate change will amplify this issue (e.g. floods and landslide in wet season and drought in dry season) and will result in biodiversity loss. The paper also highlights the linkage between land use change and ecosystem services.

*Chapter Three (Management of Thailand's Protected Areas with Adaptation to a Changing Environment)* presents the history of Thailand's protected area system since 1962, related legislation, current extents and future plan. At present although the total protected area covers about 21% of the country's land area, which is greater than the 17% designated in the Aichi target 11 of the Convention on Biological Diversity, some ecosystems are not adequately represented in the current protected area categories. Most protected areas are situated in high altitudes, where biological diversity is less than in lowlands. In addition, they are mainly found in the north and the western part of the country. In addition, this chapter also presents some on-going innovation approaches (e.g., biodiversity corridors, trans-boundary biodiversity conservation, and adaptation to future trends in land-use and climate change) developed in order to mitigate the negative impacts and to enhance management planning of Thailand's protected area system.

*Chapter 4 (Moving towards Co-existence and Conservation Partnership)* presents the shared history between human and wildlife interactions in Thailand, and anthropogenic land use changes and human activities that have caused several conservation-related conflicts, especially human-wildlife conflict (HWC). To address the HWC problem, this chapter exhibits important case studies between human and Asian elephants, gaurs, and monkeys, and depicts the conflicts between different groups of people about Asian hornbills. This chapter reviews various approaches used for resolving conflicts, then highlights the conflict mitigation tools useful to transform conflicts into co-existence between people and wildlife and create partnerships for wildlife conservation. Finally, lessons learned from Thailand about HWC are presented including identifying those related to capacity, tools, research, management, and policies.

*Chapter 5 (Water Resources Management in Thailand: Challenges and Opportunities)* reviews general situation of water resources across the regions in Thailand, then discusses a number of measures for management and planning (e.g., watershed classification, land use measures, water resource conservation policy and management measures). Flood and drought situations and trends, as well as climate change related impact and adaptation policy and management measures are included. This chapter also presents on-going water resources management and plans aiming at resolving the above obstacles in a more effective manner.

*Chapter 6 (Climate Change and Sustainable Groundwater Management in Thailand)* presents groundwater situation in Thailand. Groundwater is an important source of water for socio-economic development in Thailand. This chapter discusses groundwater storage in all 25 river basins of Thailand, especially the Chao Phraya-Tha Chin Basins located in the Central Plain. Despite the significant contribution of groundwater to the socio-economic development of the country, there are several

problems related to groundwater development and management in Thailand. Groundwater table depletion, land subsidence, groundwater contamination and sea water intrusion are the major challenges related to groundwater in Thailand. This chapter provides an overview of current groundwater issues and examines the potential and negative effects of climate change on the groundwater resources in Thailand. It also explores opportunities for adaptation to the potential impacts of climate variability and change.

*Chapter 7 (Future Trends in Energy and Climate Change in Thailand)* presents past and present green-house gases (GHG) emission from different sectors in Thailand and reviews the Alternative Energy Development Plan and Integrated Energy Blueprint. Thailand aims to reduce 7-20% of current GHG emission from industrial sector, and holds a promising future in energy generation from the renewable energy sources of 30-40% by 2036. Based on these commitments, this chapter explores various strategies for reducing GHG emissions. Stakeholders and policymakers jointly collaborate to implement the low carbon green growth policy, which suggests economic activities that are environmentally friendly, and generate less carbon or are carbon-free, as well as energy efficient.

*Chapter 8 (Environment and Health in Thailand: Investigating Epidemiological Trends of Three Infectious Diseases to Infer Scenarios)* compares the trends in infectious diseases in Thailand and other Southeast Asian countries. Special attention is paid to leptospirosis, or scrub typhus, that can help at disentangling drivers of their epidemics, i.e. climate variability, wildlife, habitat use, livestock and socio-economics. In addition, this chapter briefly explores how scenarios and prospective relating to health and environmental changes are necessary objectives. Finally, this chapter advocates for more integrated studies at both regional and local levels to investigate human / animal / environment interface, which may help to better infer environmental risks for humans and ultimately improve health surveillance systems.

*Section Three: Governance and Management*, through chapter 9-13, provides essential management mechanisms and governance for environmental and natural resources management in Thailand at local and national scales. *Chapter 9 (Community Participation in Songkhla Lake Watershed Management)* presents a case of Songkhla Lake watershed to tackle with water related problems by highlighting the historical process of lake watershed management institutions while identifying key issues and challenges of watershed management in Songkhla Lake. This watershed has encountered strong anthropogenic pressures, such as industrial development, urbanization, increased population, which caused severe problems related to land destruction and degradation, water yield and water quality. To cope with these issues, this chapter argues about how both top-down and bottom-up approaches can be set up for institutional mechanisms to achieve sustainable environmental and socio-economic development of local communities. Importantly, it also provides insights on roles of top-down and bottom-up watershed management among relevant stakeholders, which can be applicable in other watersheds as well.

*Chapter 10 (Adaptive Integrated Lake Basin Management – The Case of the Songkhla Lake Basin, Thailand)* is about developing a specific social-ecological system to evaluate governance performance of Songkhla lake basin in southern Thailand. The chapter demonstrates the use of an adaptive integrated management tool to qualitatively and quantitatively assess the social-ecological system of the basin, and determine the governance performance status of the Songkhla Lake.

*Chapter 11 (Governance Challenges for the Sustainability of Marine and Coastal Resources)* identifies critical trends for marine and coastal resources management in Thailand, of which deterioration in governance or the widening gap between policies and laws and their implementation as of major

importance, particularly in coastal areas where sustainable development is difficult to achieve. The governance gaps are contributing to another critical trend – increasing inefficiency in the use of resources. In addition, this chapter determines key weaknesses in the governance of marine and coastal resources: 1) inadequate sector integration and coordination among all levels of government, 2) limited capacity and role of local leadership, 3) inadequate communication and information dissemination, and 4) insufficient stakeholder participation in making and implementing decisions. Potential resolution measures are recommended.

*Chapter 12 (Institutional Development of Natural Resources Governance: The Cases of Forests and Lands)* reviews mechanism development for natural resources management in Thailand in order to understand effective management for particular conditions of the national governance. This chapter demonstrates that the institutional analysis and development is the key tool to synthesize institution structures and their roles in Thai society and the ways in which they develop to reducing conflicts of resource uses among stakeholders (e.g. government, NGOs and local communities) and to empower local people to find solutions for preventing environmental problems.

*Chapter 13 (Climate Change Adaptation and Women's Political Participation in Thailand: An Analysis of Transnational Advocacy Networks)* determines the role of women in natural resources management in particular climate change adaptation. Thai women also face both gender inequality, discrimination and sexism. This chapter explains how women overcome both gender and environmental issues to improve their quality of life. Through case studies and the analysis of a women's transnational advocacy group, this chapter notes that women are engaged in activities that promote climate change adaptation while improving their political positions in ways that bypass traditional avenues of progress.

*Section Four: Global Initiatives and Economic Tools* provides case studies to use the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES) Framework and economic tools for effective natural resources management and to enhance human well-being. *Chapter 14 (IPBES Scenarios and Models: Filling the Gaps on Biodiversity Conservation and Ecosystem Services)* briefly presents the IPBES conceptual framework, which explains the relationships for the conservation and sustainable use of biodiversity and ecosystem services, human well-being and sustainable development. It also explains the roles of scenarios and models within the context of IPBES, including direct and indirect drivers to changes and impacts on biodiversity and ecosystem services and types of scenarios and models. Two specific case studies of different geographic scales, 1) land use effects on water yield and sediment at Wang Thong watershed in Petchabun province of Thailand, and 2) climate change impact on rice production in the Lower Mekong Basin are elaborated. This chapter also envisions how IPBES scenarios and models will contribute to Aichi targets 2020 and UN sustainable development goals (SDGs) 2030.

*Chapter 15 (Society's Preference for Ecosystem Services from Irrigated Rice Areas: A Case Study in Northeast Thailand)* investigates social preferences for ecosystem services provided by rice irrigated agriculture in Thailand. It was found that non-monetary ranking of these services can provide robust insights into societal demands and their heterogeneity. The averaged preferences ranked by order included economic, social, environmental and regulating services, as well as cultural and recreational services. Furthermore, the ecosystem service preferences were influenced by age, agricultural working experience, household income, education, and occupation. Although farmers are dependent upon environmental and social functions for daily livelihood, cash incentive was the most important factor that encouraged farmers to focus only on food production and ignore other services. This chapter also discussed a future pathway for a more balanced system of incentives for rice farmers.

*Chapter 16 (Payment for Ecosystem Services Scheme in the Mae Sa Watershed, Thailand)* presents a pilot study of integrated community-based forest and catchment management through an ecosystem

service approach (CBFCM) project, which aimed at testing of defined Payment for Ecosystem Services (PES) to strengthen the capacities of local authorities, communities, and the private sector to ensure that PES is used for promoting sustainable land use practices that would lead to improved water quality. Some positive changes in attitude of stakeholders toward innovative financing mechanisms, increased involvement of local businesses in management of natural resources and environment were observed during and after the project implementation.

*Chapter 17 (Toward an Effective Environmental Resources Management in Thailand) in Section V: Conclusions and Recommendations* summarizes and presents analytical views on the status, trends and way forward with regard to the issues of environment and natural resources management in the context of sustainable development under changing anthropogenic pressures and climate change. Key recommendations to enhance existing management measures, mechanisms and governance are also provided.

The target audiences of this edited book include individual scientists, graduate students, stakeholders, and policy makers who are interested in and involved in various aspects of natural resources and environmental management. The editors and chapter authors hope that the book may inspire the readers in Thailand and other Southeast Asian countries in promoting an incessant environment and development policy dialogues and encouraging greater accountability for better environmental management and sustainable development for humankind.

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