POLICY RECOMMENDATIONS FOR WATER MANAGEMENT ENHANCEMENT THROUGH SCIENCE, TECHNOLOGY, AND INNOVATION (STI)

SPEARHEAD RESEARCH PROGRAM FOR SOCIAL STRATEGIC GOALS ON WATER MANAGEMENT

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Policy Recommendations for Water Management Enhancement through Science, Technology, and Innovation (STI)

Spearhead Research Program

for Social Strategic Goals on Water Management

Propose to

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by

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Preface

This book aims to propose policy recommendations to enhance water management through science, technology, and innovation (STI). It involves a thorough review of international practices in utilizing STI, summarizing outcomes from three consecutive phases of the Spearhead Research Program to show the main research outcomes of each technologies developed. To enhance water management at the operational level, innovation can be created by systematic integrated design from developed technologies, which can improve water management to match with predefined goals effectively and efficiently in each study area. Four study areas applied for water management enhance are 1) pumping and storage efficiency improvement and water reuse/ recycle improvement for industry in the Eastern Economic Corridor, 2) improvement of dam release control to increase dam water storage in the Central Plain, 3) improvement of water release control in an irrigation project to reduce conveyance water losses, and 4) development of water user group in a rainfed area via Geographic Information Systems for Community Water Management Planning linked with the Provincial Integrated Water Resources Plan.

The book presents existing water management issues and challenges, innovative technological advancements, review of technology-driven improvements to water management on an international level, Thailand's Sustainable Development Goals (SDGs) and water security status, and main research outcomes from the National Research Council of Thailand (NRCT) Spearhead Research Program. It also includes samples of innovative designs derived from new technologies developed from the NRCT Spearhead Research Program in four study areas and policy recommendations for further implementations.

The author hopes that this book will serve as a guideline in formulating policies that apply STI as tools to enhance water management. The aim is to fulfill SDGs and enhance Thailand's water security through the application of technological advancements. By focusing on practices that ensure efficient water usage, the book seeks to address water security issues and elevate water productivity of water utilization, aligning with the objectives outlined in the National Strategic Plan's master plan. Thanks to all researchers, supporting staff and agencies during the Spearhead Research Program.

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Introduction

1.1 Problems in water management

Water resources are essential for daily life and are crucial factors in the production of goods and services, contributing significantly to economic and social development. They also support energy production and the creation of sustainable environmental systems. Therefore, highly efficient water management, achieved by balancing water demand, quantity, and quality, is of utmost importance. Currently, the risks and damages from water-related disasters tend to be more severe than before. The world faces high risks, particularly from the impacts of climate change, which is a predictable event. Therefore, disasters related to climate change can be anticipated and planned for mitigation (Visessri S., 2022). The conditions of water scarcity, water demand, value creation from water usage, and water stress in the main river basin follow the patterns depicted in Figure 1 and Figure 2.