

Integrated Water Resources Management In View of Environmental Sustainability Aspects

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**Mohamad Ali Fulazzaky
Sutardi**



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Perpustakaan Negara Malaysia Data Pengkatalogan-dalam-Penerbitan

Mohamad Ali Fulazzaky
Integrated water resources management in view of environmental sustainability aspects / Mohamad Ali Fulazzaky, Sutardi

ISBN 978-983-2963-75-2

1. Water resources development--Malaysia. 2. Integrated water development--Malaysia. 3. Water quality management--Malaysia. 4. Sustainable development--Environmental aspects--Malaysia. I. sutardi. II. Title. 333.9115

Diterbit dan dicetak oleh :

Pejabat Penerbit
Universiti Tun Hussein Onn Malaysia
86400 Parit Raja, Batu Pahat
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Integrated Water Resources Management in View of Environmental Sustainability Aspects

Lessons learned from Indonesian experiences on integrated water resources management planning and implementation

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To:
my daughter **Tahira**,
my son **Zaky**, and
my wife **Ambar**
who motivate me (1st author) in encouraging the finishing this work

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Preface

Integrated Water Resources Management (IWRM) in view of environmental sustainability aspects is geared toward readers of decision-makers level taking an introductory to peer the profound problems on water resources and environment. Integrated management means that all the different uses of water resources are considered together. The basis of IWRM is that different uses of water are interdependent. Water allocations and management decisions consider the effects of each use on the others. They are able to take account of overall social and economic goals, including the achievement of sustainable development. The book's material is also applicable for readers enrolled in upper level science, technology and engineering related to water resources and environment. The readers should already understand such water supply, wastewater, irrigation, water and food production, water and natural disaster, industrial water consumption, cooling water, hydropower energy, and river transportation as well as environmental sustainability.

The original Integrated Water Resources Management in View of Environmental Sustainability Aspects is based on the study team report on "Integrated Water Resources Management and Efficiency Plans by 2005 Project", authored by Sutardi, Fulazzaky, Purwonugroho and Suzzana, appeared in July 2006. The use of this text as national report for the IWRM 2005 Regional Meeting in Rayong – Thailand on September 10 – 13, 2006 has encouraged the authors to continue building on the main purpose of the book – to extend lucidly the understanding of integrated water resources management. The basic IWRM concept has been extended to incorporate participatory decision-making.

This book exposes readers to a broader environmental aspect of water resources management through separate chapters on: (i) Indonesian context and IWRM implementation status, Chapter 1 reviews water resources balance, key issues, regulation and policy, and IWRM implementation status essential for grasping the fundamentals of integrated water resources management; (ii) project's objectives, works plan, implementation and workshop, Chapter 2 introduces the project's organization as tool for problem solving based on stakeholders participatory and shows how to manage a task forces in different disciplines of water uses; (iii) outcomes and results of project activities summarized in Chapter 3; (iv) lessons learned from IWRM planning and implementation in Indonesia are presented in Chapter 4; and (v) finally, Chapter 5 proposes way forward towards the vision of IWRM through national IWRM roadmap for IWRM implementation and also appealing the regional and international cooperation and support needs.

Acknowledgments

Besides the authors as the members of study team i.e., Dr. Mohamad Ali Fulazzaky who contribute analysis and evaluation on water and people, water and food, and water and industry and Dr. Sutardi who contribute on introduction and general view of integrated water resources management. We would like to explicitly thank the following individuals as also the members of study team for their contributions to this book i.e., Mr. Sutopo Purwonugroho helped to contribute analysis and evaluation on water and nature as well as water and hazard, and Ms. Jossi Suzzana helped to contribute analysis and evaluation on water and energy as well as water and transportation. To them a hearty thank you.

The authors would also like to thank all participants who contribute their ideas and advises during the workshop was held on July 4, 2006 at the Ambhara Hotel – Jakarta. We would also like to thank Dr. Mochammad Amron who was assigned by Director General of Water Resources – Indonesian Ministry of Public Works as supervisor to monitor the successful of the “Project UNEP Support for Achieving the IWRM 2005 Target” that the major part of this book is referred on the final report of this project.

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About the authors

Mohamad Ali Fulazzaky is a Lecturer at Faculty of Civil and Environmental Engineering – Universiti Tun Hussein Onn Malaysia and also as a Senior Expert for Directorate General of Water Resources – Indonesian Ministry of Public Works. He received his BSc in Chemistry in 1984 and Graduate degree (Sarjana) in Physical Chemistry in 1986 from Institut Teknologi Bandung. From 1986 to 1991 he worked for Perum Jasa Tirta 1 as Chief of Water Quality Laboratory in East Java. He received his MEng in Water Engineering and Management from Ecole Nationale des Travaux Publics de l'Etat in 1992, his MSc in Water Treatment and Environmental Engineering from Institut National des Sciences Appliquées de Toulouse in 1993 and his PhD in Water Chemistry and Microbiology from Université de Pau et des Pays de l'Adour in 1996 in France. From 1997 to 1999 he was Chief of Section for Central Region of Indonesia on Water Resources Conservation at Ministry of Public Works, from 2000 to 2001 he was Policy Analyst on Water Quality Management and Pollution Control at State Ministry of Public Works, from 2001 to 2002 he was Head of Sub-directorate Hydrology and from 2002 to 2005 he was Head of Sub-directorate for Water Resources Conservation at Directorate General of Water Resources – Indonesian Ministry of Settlement and Regional Infrastructures. His responsibilities included supervision on water quality monitoring, water quality management and pollution control, water resources conservation, hydrological data management, and also involved in preparation of law and regulations as well as strategies and programs related to water resources management in Indonesia. From 1998 to 2006 Dr. Fulazzaky has taught in the areas of water quality, water resources planning and management as well as water and wastewater treatments as part-time lecturer at Institut Teknologi Bandung, Universitas Diponegoro, Universitas Islam Sultan Agung and Universitas Pancasila.

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His honors and awards include the Award of Excellence in Management Science from Administrative Science Association of Canada (ASAC) in 1992 and the Satyalancana Karya Satya 20 Tahun from President of the Republic of Indonesia.

Dr. Sutardi research interest lies in dealing with the problems of multi-objective water resources investment planning under budgetary and socio-technical uncertainty, and under fuzzy environment. His publications have appeared in *International Journal of Production Economics*, *Journal of Water Resources Planning and Management*, *Water International*, *IEEE Transactions on Engineering Management*, and *European Journal of Operational Research*.