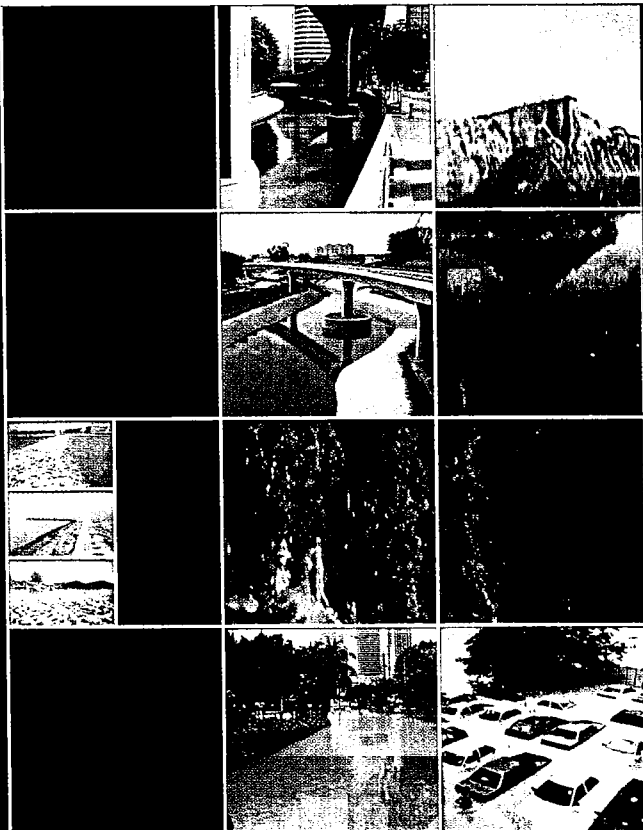


Water Environmental Planning



Towards integrated planning and management of water resources for environmental risks

***Alias Abdullah
Norio Okada
Mohd Kamil Yusoff***



Water Environmental Planning

Towards Integrated Planning and Management of
Water Resources for Environmental Risks

Alias Abdullah
Norio Okada
Mohd Kamil Yusoff
Editors



**INTERNATIONAL ISLAMIC
UNIVERSITY MALAYSIA**

Alias Abdullah
Department of Urban & Regional Planning,
Kulliyah of Architecture & Environmental Design,
International Islamic University Malaysia, Jalan Gombak,
53100, Kuala Lumpur, MALAYSIA
drahas@iu.edu.my

Norio Okada
Disaster Prevention Research Institute
Kyoto University, Gokasho, Uji,
Kyoto 611-0011, JAPAN
okada@imdr.dpri.kyoto-u.ac.jp

Mohd Kamil Yusoff
Faculty of Science & Environmental
Studies, Universiti Putra Malaysia,
43400 Serdang, Selangor, MALAYSIA
mkamil@fsas.upm.edu.my

First Edition, 2004
©Alias Abdullah

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, or otherwise, without the prior permission of the publisher. The views expressed in this publication are those of the author(s) and do not necessarily represent the views of the editors and the publisher.

Perpustakaan Negara Malaysia Cataloguing-in-Publication Data

Alias Abdullah, 1961

Water environmental planning : towards integrated planning
and management of water resources for environmental risk /
Alias Abdullah, Norio Okada, Mohd Kamil Yusoff

Includes index

Bibliography p. 615

ISBN 983-40872-5-X

1. Water—Environmental aspects—Congresses. 2. Water resources
development—Environmental aspects—Congresses 2. Water quality
management—Congresses I. Okada, Norio. II. Mohd Kamil Yusoff.
III. Seminar on Water Environmental Planning (2002) IV. Title.
333.91

Published by:

Bureau of Consultancy & Entrepreneurship
International Islamic University Malaysia
53100, Kuala Lumpur, MALAYSIA
Tel: +603 20565430
Fax: +603 20565439 Email: bce@iiu.edu.my

Chapter 28

Land-use Classifications and Physiographic Characteristics of Sg. Pandan Catchment	505
Statistics of Stormwater Quality	508
Event Mean Concentration for Sg. Pandan for the Three Storm Events	510
Observed Event Based Pollutants Loadings	511
Design Volumes Estimated Using Volumetric Rational Method with the Corresponding Rainfall Depths of Different ARIs and Duration of 90-minute	512
Estimated Design Pollutant Load by Volumetric Rational Method	512
Cumulative Annual Loading for Various ARI	513

Chapter 30

Summary of arsenic removal processes	527
Classification of Cyanide and Cyanide Compounds in Cyanidation Solution on the Basis of Stability	529

Chapter 31

Benefits of Bio-Ecological Drainage Systems.....	543
Ranges of BMP Pollutant Removal Rates (%)	547
Comparison of Design Criteria for Ecological Swale based on MASMA and others.....	553
The construction cost of rainwater infiltration facility in Japan	560
Average annual operation and maintenance costs for a sustainable drainage (e.g. grass swale) for United Kingdom (Ellis, 1998)...	561
Summary of Estimated Maintenance cost for Mixed Development Project at Tuanku Heights, Seremban.....	562

Chapter 32

Classification of the Sediment Load in the Inflow Water	576
Typical Hydrologic Data for a Detention Pond	576
Trapping Efficiency, η (%) of the Filter at Different Time for E1 – E10	581

Table of Contents

Foreword	v
Table of Contents	vii
List of Tables	xi
List of Figures	xv

SECTION 1: Planning and Management

1	Land Use Planning for Sustainable Water Resources Management in Malaysia	3
	WAN MOHAMMAD MUKHTAR BIN MOHD. NOOR	
2	Integrated River Basin Management	19
	SALMAH ZAKARIA	
3	A Critique on Water-Based Tourist Resort Development in Malaysia	45
	CHE MUSA CHE OMAR	
4	Waterfront Landscape Design Considering the Biwako Canal Network	59
	YOSHIFUMI DEMURA, NAOTO TANAKA, MASASHI KAWASAKI, KEIJIRO YAMADA & YOSHIO NAKAMURA	
5	Waterfront Landscape Design Considering the Hierarchical River Network	81
	KEIJIRO YAMADA, MASASHI KAWASAKI & YOSHIO NAKAMURA	
6	A New Research Perspective Integrated Management for Disaster and Environmental Risk	115
	NORIO OKADA	
7	Economic Valuation of Catastrophe Risks Management	131
	KIYOSHI KOBAYASHI & MUNETA YOKOMATSU	

SECTION 2: Legislation, Policies and Ethics

8	Legal Approach towards Water Resources Protection and Pollution Control in Malaysia	151
	MAIZATUN MUSTAFA	
9	Policy and Legislative Development in Water Resources Management Paradigm – A Case Study on SWMA	177
	RAHMAT BIN MOHD. SHARIF	

- 10 Modern Ethics in Water Management and it's Alternatives219
MOHD. ARIP KASMO
- 11 Abatement and Control of Water Pollution: Perspectives and
Strategies 229
ABDUL HASEEB ANSARI & PARVEEN JAMAL

SECTION 3: GIS and DSS

- 12 Spatial Planning and Decision Support System for
Modeling Water Resources 261
ALIAS ABDULLAH, M. ZAINORA ASMAWI &
LUKMAN HAKIM MAHAMOD
- 13 Spatial Ecological Evaluation of Water Conservation in
Jabotabek Area, Indonesia Using GIS283
ALINDA MEDRIAL ZAIN, KAZUHIKO TAKEUCHI &
ATSUSHI TSUNEKAWA
- 14 Modeling River Water Quality Index Using Artificial Neural
Networks and Geographical Information System 299
KAMARUL ISMAIL & RUSLAN RAINIS
- 15 An Application of Second Order Neural Network Back
Propagation Method in Modeling River Discharge at
Sungai Langat, Malaysia 307
HAFIZAN JUAHIR, SHARIFUDDIN M. ZAIN, ZAINAL AHMAD &
M. NAZARI JAAFAR
- 16 Watershed Topographic Modeling325
PATRICK WONG, M.A.
- 17 An Expert System Prototype for Design Flood Estimation
Techniques341
WARDAH TAHIR & ZAIDAH IBRAHIM

SECTION 4: Water Quantity and Floods

- 18 Sustainable Water Resource Management: Rooftop
Rainwater Harvesting as Supplementary Clean Water
Supply in Malaysia353
AZIZI MUDA, MOHD. KAMIL YUSOFF, ROSTA HARUN &
LEE SU SENG

- 19 Groundwater Potential in Pulau Manukan, Sabah,
Malaysia 371
MAGID M. FAISAL, RODEANO ROSLEE, SHARIFF A.K. OMANG,
MOHD HARUN ABDULLAH AND ZULHERRY ISNAIN
- 20 Wetland Creation and Restoration for Flood Control
and Stormwater Treatment – A Case Study of Putrajaya
Wetland in Malaysia 379
SIM CHENG HUA
- 21 Assessment on Rainfall Erosivity with Regard to the Flood
Occurrence at Major River of Peninsular Malaysia 389
ROSLAN ZAINAL ABIDIN & JANMAIZATULRIAH JANI
- 22 Comparison of Three Flood Runoff Models in the Shonai
River Basin, Japan 401
TOSHIHARU KOJIMA, YASUTO TACHIKAWA & KAORU TAKARA
- 23 A Simulation-Based Optimization Approach for Integrated
Flood Risk Management 423
HIROKAZU TATANO & NORIO OKADA

SECTION 5: Water Quality

- 24 Determining the Suitability of Physico-Chemical Aspects of Water
Quality at Putrajaya Wetlands for Water-Based Recreational
Activities 441
NIK ISMAIL AZLAN
- 25 Non Point Source Pollutant Loading Modeling at
Sg. Teris Besar, Negeri Sembilan, Malaysia 451
MOHD KAMIL YUSOFF, LOI CHEN LEAN, ROSTA HARUN &
AZIZI MUDA
- 26 Urban River Rehabilitation – Water Quality and Pollution
Loads of Sungai Tebrau, Johor 461
MAKETAB MOHAMED, ZULKIFLI YUSOP AND ZAINI UJANG
- 27 Issues of Water Quality Study in Preliminary Environmental
Impact Assessment – A Case Study on Development Project
in Bukit Besi, Terengganu, Malaysia 481
SHAMZANI AFFENDY MOHD. DIN

- 28 Stormwater Quality and Pollutant Loadings from an Urban Catchment in Johor Bahru 501
ZULKIFLI YUSOP, TAN LAI WAI, KAMARUL AZLAN MOHD NASIR & MAKETAB MOHAMAD

SECTION 6: Water Treatment

- 29 Sewage Management and its Relation to Auto Control Simulation of River Catchment 517
GR DHANAGUNAN, PIJUSH GOPE & ANPALAGAN SOCKALINGAM
- 30 Effective Optimization of Industrial Wastewater Treatment Processes 525
BALASUBRAMANIAM PERUMAL & ERIC GOH
- 31 Bio-Ecological Drainage Systems (BIOECODS): An Integrated Approach for Urban Water Environmental Planning 539
LARIYAH MOHD SIDEK, KAORU TAKARA, AMINUDDIN AB. GHANI, NOR AZAZI ZAKARIA, ROZI ABDULLAH
- 32 Modeling the Effectiveness of Detention Ponds in Improving the Quality of Stormwater 569
THAMER AHMED MOHAMMED, ABDUL HALIM GHAZALI, MEGAT JOHARI MEGAT MOHD. NOOR & SALIM SAID
- 33 Automation of Sg Selangor Phase 2 Water Treatment Plant ... 589
AUSAMAH DARWISH MOHD. DAUD
- Selected Bibliography 615
List of Contributors 629
Index 641

Chapter 33

Name Assignment for the Master Base Stations	601
The Operating Frequency for the Treatment Plant, Intake Works and the Reservoirs	605

8

LEGAL APPROACH TOWARDS WATER RESOURCES PROTECTION AND POLLUTION CONTROL IN MALAYSIA

Maizatun Mustafa

*Ahmad Ibrahim Kullyyah of Laws
International Islamic University Malaysia*

ABSTRACT

The significance of water resources in Malaysia is immense especially in providing water supply for domestic, agricultural and industrial consumption. However, over the years, the problem of water pollution in Malaysia is getting more serious and widespread. This situation becomes a great concern as when water is polluted, its quality deteriorates, causing problems such as health hazard and water shortage. Legal instrument has been known to be an important tool in combating the pollution of water resources. For this purpose, this paper seeks to provide an overview of the existing legal framework set up to manage and control water pollution, to highlight factors considered to be major obstacles undermining the efficacy of the law, and to provide suggestions for improvement. This paper seeks to (1) discuss the scope, jurisdiction and strategies of the present legislations with regard to inland water pollution control, (2) identify factors considered to be major impediments that undermine legal efficacy, and (3) point the way forward.