



Aquaculture and the Environment

Present Status and Future Challenges

Mohammad Mustafizur Rahman

Editor

IUM PRESS

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA



Aquaculture and the Environment

Present Status and Future Challenges

Editor
Mohammad Mustafizur Rahman



HUM Press

Published by:
IIUM Press
International Islamic University Malaysia

First Edition, 2011
©IIUM Press, IIUM

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, recording, or otherwise, without any prior written permission of the publisher.

Perpustakaan Negara Malaysia

Cataloguing-in-Publication Data

Mohammad Mustafizur Rahman
Aquaculture and the Environment: Present Status and Future Challenges
Mohammad Mustafizur Rahman
Include index
Bibliography: p.
ISBN

ISBN: 978-967-418-197-0

Member of Majlis Penerbitan Ilmiah Malaysia – MAPIM
(Malaysian Scholarly Publishing Council)

Printed by :
IIUM PRINTING SDN.BHD.
No. 1, Jalan Industri Batu Caves 1/3
Taman Perindustrian Batu Caves
Batu Caves Centre Point
68100 Batu Caves
Selangor Darul Ehsan

CONTENT

| | Page no. |
|--|----------|
| Preface | 09 |
| Chapter 1 : CURRENT STATUS OF GLOBAL AQUACULTURE AND THE ENVIRONMENT | 10 |
| Chapter 2 : EFFECTS OF CHINESE AQUACULTURE ON GLOBAL FOOD SECURITY | 20 |
| Chapter 3 : AQUACULTURE IN CHINA: A FOCUS ON MAJOR CONTRIBUTING SPECIES | 25 |
| Chapter 4 : FUTURE PROSPECTS OF MARINE FISH FARMING IN INDONESIA | 32 |
| Chapter 5 : POTENTIALITY OF INDIAN FRESHWATER AQUACULTURE TO WORLD FISH SUPPLY | 41 |
| Chapter 6 : COASTAL AQUACULTURE IN INDIA: PRESENT STATUS AND FUTURE PROSPECTS | 50 |
| Chapter 7 : CATFISH: A MAJOR CONTRIBUTOR IN THE AQUACULTURE PRODUCTION OF VIETNAM | 57 |
| Chapter 8 : AQUACULTURE PRACTICES IN PHILIPPINES UNDER VARIOUS ENVIRONMENTS AND CULTURE SYSTEMS | 63 |
| Chapter 9 : SHRIMP AQUACULTURE DEVELOPMENT IN THAILANDS: A CHALLENGE FOR SUSTAIBABILITY | 70 |
| Chapter 10 : MARICULTURE IN SOUTH KOREA: THE OPPORTUNITY FOR GROWTH | 77 |
| Chapter 11 : SEAWEED AQUACULTURE IN JAPAN: PRESENT STATUS AND FUTURE PROSPECTS | 82 |
| Chapter 12 : FUTURE PROSPECTS OF AQUACULTURE IN BANGLADESH: A HALLENGE OF MINIMIZING THE ENVIRONMENTAL EFFECTS | 89 |

CONTENT (continued)

| | |
|--|-----|
| Chapter 13 : A SUCCESS STORY OF THE ATLANTIC SALMON AND TROUT AQUACULTURE IN NORWAY | 99 |
| Chapter 14 : THE SUCCESS OF SALMON AND TROUT FARMING IN CHILE | 105 |
| Chapter 15 : AQUACULTURE IN MYANMAR: A HIGH FUTURE PROSPECT | 112 |
| Chapter 16 : CHANNEL CATFISH CULTURE IN USA: AN ORGANIZED AQUACULTURE INDUSTRY | 118 |
| Chapter 17 : CURRENT STATUS OF AQUACULTURE IN MALAYSIA | 124 |
| Chapter 18 : BRAZIL: A FUTURE LEADER OF THE AQUACULTURE SECTOR | 129 |
| Chapter 19 : PROSPECTS OF COBIA AQUACULTURE IN TAIWAN | 134 |
| Chapter 20 : AQUACULTURE IN SPAIN: A SPECIAL EMPHASIS ON SHELLFISH QUACULTURE | 141 |
| Chapter 21 : CULTURE OF <i>Macrobrachium Rosenbergii</i> USING SOY BEAN MEAL IN HATCHERY REARED CONDITIONS | 146 |
| Chapter 22 : STATUS OF HILSA (<i>Tenualosa ilisha</i>) FISHERY IN BANGLADESH | 154 |
| Chapter 23 : COMMUNITY BASED AQUACULTURE IN BANGLADESH: IMPACTS OF SEASONAL FLOODPLAIN AQUACULTURE ON THE LIVELIHOOD OF BENEFICIARIES | 178 |
| Chapter 24 : EFFECTS OF NITRIFYING BACTERIA AND PROBIOTIC BACTERIA ON THE JUVENILE REARING OF PATIN (<i>Pangasius hypophthalmus</i>) | 205 |
| Chapter 25 : COMMERCIAL SPECIES OF SEA CUCUMBER (<i>ECHINODERMATA: HOLOTHUROIDEA</i>) FROM FAMILY STICHOPODIDAE | 218 |
| Chapter 26 : PHYTOPLANKTON COMMUNITIES IN AQUACULTURE POTENTIAL PENOR RIVER PAHANG MALAYSIA | 225 |

CONTENTS (continued)

| | |
|--|-----|
| Chapter 27 : FOOD SAFETY IN SHRIMP AQUACULTURE INDUSTRIES OF BANGLADESH: TOWARDS MICROBIOLOGY AND BIOCHEMICAL APPROACH | 238 |
| Chapter 28 : MICROBIAL COMMUNITIES AND WATER QUALITY OF AQUACULTURE POTENTIAL PENOR RIVER, PAHANG, MALAYSIA | 250 |
| Chapter 29 : FISH DISEASES IN SMALL INDIGENOUS FRESHWATER FISHES OF BANGLADESH | 262 |
| Chapter 30 : ENVIRONMENTAL IMPACT ON THE COASTAL AQUACULTURE IN BANGLADESH: A REVIEW | 276 |

Chapter 1

CURRENT STATUS OF GLOBAL AQUACULTURE AND THE ENVIRONMENT

Mohammad Mustafizur Rahman

INOCEM, Kulliyyah of Science, International Islamic University Malaysia,

Jalan Istana, Bandar Indera Mahkota, 25200 Kuantan, Pahang, Malaysia.

Email: mustafiz@iiu.edu.my

INTRODUCTION

Aquaculture refers to the cultivation of both marine and freshwater species and can range from land-based to open-ocean production. According to United States Department of Agriculture (USDA), aquaculture is a form of agriculture, and it is defined by the production of aquatic animals and plants under controlled conditions for all or part of their life cycle. However, aquaculture is the farming of aquatic organisms especially fish, shellfish and aquatic plant. Aquaculture acquired importance during the last three centuries with progressive increase in the demand for fish, shellfish and seaweed. The scope for increasing the supply of seafood from traditional fisheries is limited. Therefore, aquaculture has been playing a very important role in feeding the growing populations of many