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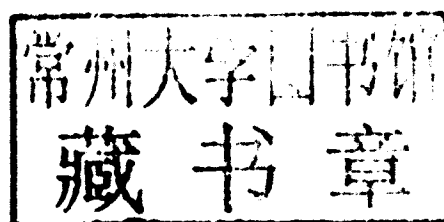
**GLOBAL CONFERENCE ON AQUACULTURE 2010
FARMING THE WATERS FOR PEOPLE AND FOOD**

Phuket, Thailand, 20–25 September 2010



Report of the
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PREPARATION OF THIS DOCUMENT

This is the final report of the Global Conference on Aquaculture 2010 – Farming the waters for people and food, which was held in Phuket, Thailand, from 20 to 25 September 2010.

FAO.

Report of the Global Conference on Aquaculture 2010 – Farming the waters for people and food. Phuket, Thailand, 20–25 September 2010.

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ABSTRACT

Organized by FAO and NACA and hosted by the Government of the Kingdom of Thailand, the Global Conference on Aquaculture 2010 – Farming the waters for people and food (Phuket Conference on Aquaculture) was held from 22 to 25 September 2010 in Phuket, Thailand. Its purpose was to review the present status and trends in aquaculture development, evaluate the progress made in the implementation of the *Bangkok Declaration and Strategy on Aquaculture Development Beyond 2000*, address emerging issues in aquaculture development, assess opportunities and challenges for future aquaculture development, and build consensus on advancing aquaculture as a global, sustainable and competitive food production sector. This event was a follow-up to the *Conference on Aquaculture in the Third Millennium*, which was organized by Network of Aquaculture Centres in Asia-Pacific (NACA) and FAO in February 2000, and the *Kyoto Conference on Aquaculture* organized by FAO in May and June 1976. Attended by 446 registered participants from 80 countries in Asia, Africa, Europe, Latin America and the Caribbean, the Near East, North America and Oceania, representing all stakeholder groups in aquaculture, it was organized in four sessions (introduction and opening, regional reviews and a global synthesis on aquaculture development, thematic sessions in six plenary lectures and 20 expert reviews, recommendations and conclusions based on these thematic reviews) and included three invited guest lectures, four side events and poster sessions (abstracts of 144 papers).

A main outcome of the Phuket Conference on Aquaculture is the “Phuket Consensus”. This “Consensus” reaffirms commitment to the principles laid out in the *Bangkok Declaration and Strategy* adopted in the Global Conference on Aquaculture in 2000 and recommends additional actions to address contemporary priorities. These recommendations consist in: (i) increasing the effectiveness of governance of the aquaculture sector; (ii) encouraging and facilitating greater investments in scientific, technical and social innovations; (iii) conducting accurate assessments of the progress and contributions of aquaculture (including aquatic plants) to national, regional and global economies, poverty alleviation and food security; (iv) intensifying assistance to the small farmers; (v) supporting gender sensitive policies and implement programmes that facilitate economic and political empowerment of women through their active participation in aquaculture; (vi) increasing and strengthening collaboration and partnerships; and (vii) giving special emphasis on sub-Saharan Africa and the least aquaculturally developed countries and areas in order to allow them to develop their aquatic resource potentials.

This report summarizes the presentations, discussions and insights provided by the Conference. It includes five parts and one Annex section. Part 1 covers the introduction session of the Conference and provides an overview of the whole event. Part 2 recaps the presentations and discussions of the regional and global reviews on aquaculture development. Part 3 summarizes the presentations and discussions of the six thematic sessions. Part 4 summarizes the presentations and discussions of the three invited guest lectures. Part 5 reviews the recommendations from the six thematic sessions. The Annex section includes the list of participants, the Conference program, the abstracts of the two keynote addresses and the three invited guest lectures as well as the full text of the Phuket Consensus. Regional reviews, the global synthesis and the thematic reviews are published separately.

Abbreviations

ANAF	Aquaculture Network of African Farmers
APR	average yearly growth
BMPs	best management practices
CCRF	Code of Conduct for Responsible Fisheries
COPs	Codes of Practice
DALYs	disability-adjusted life years
DG-RTD	Directorate General for Research and Innovation
EAA	ecosystem approach to aquaculture
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drug Administration
GAqfs	Gobierno de las industrias pesqueras
GTZ (GIZ)	Deutsche Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation)
IOC	International Organizing Committee
LAC	Aquaculture in Latin America and the Caribbean
NACA	Network of Aquaculture Centres in Asia-Pacific
NACEE	Network of Aquaculture Centres in Central Eastern Europe
NEPAD	New Partnership for Africa's Development
NGO	non-government organization
RAA	Aquaculture Network for the Americas
R&D	Research and development
SMEs	small and medium enterprises
SOFIA	Status of World Fishery and Aquaculture
SPADA	Special Programme for Aquaculture Development in Africa
TAC	total allowable catch
UNEP	United Nations Environment Programme
WTO	World Trade Organization

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PART 1: INTRODUCTION

Background

1. The past four decades have recorded three events that had significant influence over global aquaculture development.
2. In May/June 1976, the FAO Technical Conference on Aquaculture was held in Kyoto, Japan. The Conference adopted two strategies of aquaculture development including bringing science into aquaculture and expanding aquaculture development through regional cooperation.
3. In February 2000, the Conference on Aquaculture in the Third Millennium was held in Bangkok, Thailand. The Conference adopted the *Bangkok Declaration and Strategy on Aquaculture Development Beyond 2000*. The Declaration addresses the role of aquaculture in alleviating poverty, enhancing food security, maintaining the integrity and sustainability of natural resources and environment; and the Strategy suggests measures that incorporate aquaculture into the development programs of the public and private sectors.
4. In September 2010, 496 people from 80 countries participated in the Global Conference on Aquaculture in Phuket to discuss the current status of the sector, emerging issues and strategies for its sustainable development in the coming decade. The list of Conference participants is provided in Appendix 1.¹

Objectives

5. The aims of the Conference were to 1) review the present status and trends in aquaculture development; 2) evaluate the progress made in the implementation of the *Bangkok Declaration and Strategy on Aquaculture Development Beyond 2000*; 3) address emerging issues in aquaculture development; 4) assess opportunities and challenges for future aquaculture development; and 5) build consensus on advancing aquaculture as a global, sustainable and competitive food production sector.

Organization

Preparatory activities

6. The need to have a follow-up Conference to Aquaculture in the Third Millennium held in Bangkok, Thailand, February 2000, was conceived at the 19th Network of Aquaculture Centres in Asia-Pacific (NACA) Governing Council Meeting held in February 2008, Kathmandu, Nepal. This idea was almost immediately followed up by NACA in conjunction with the Fisheries and Aquaculture Department (FAO) and the Department of Fisheries, Kingdom of Thailand, when interim organizational committees were set up, and the idea communicated to the public on the respective web sites of these organizations. Key committees were formed to ensure that the representation to this event will be spread across globally and will portray, as much as possible, expertise from all the world's regions as well as national and organizations. This Conference reflects these committees' efforts coming to fruition.

¹ Some participants who did not provide information on their affiliations are not included in the list.

Opening ceremony

7. Dr Somying Piumsombun, Director General of the Department of Fisheries, Thailand, opened the Conference on the morning of 22 September 2010. Welcome remarks were successively delivered by Mr Hiroyuki Konuma, FAO Assistant Director-General and FAO Regional Representative for Asia and the Pacific (RAP); Mr Thammarat Wanglee, Advisor to the Minister of Agriculture and Cooperatives, Thailand; and Professor Sena De Silva, Director General of NACA. The audio materials of these speeches can be found at www.enaca.org/modules/aqua2010/presentations.php.

Inputs

8. The technical part of the Conference started with two keynote addresses, followed by the presentation of one global aquaculture synthesis and six regional reviews on Aquaculture. These reviews summarized the current state of aquaculture development in different areas of the world. The programme of the four-day Conference also included six thematic sessions that consist of 20 expert panel presentations, six plenary lectures and three guest lectures. Additionally there were poster sessions and side events. The detailed Conference program is provided in Appendix 2.

Keynote addresses

9. Two keynote addresses were given at the start of the Conference on the morning of 22 September 2010.

10. Professor M.S. Swaminathan, known as the Father of Green Revolution in India and World Food Prize awardee, delivered the first keynote address on “Aquaculture and sustainable nutrition security in a warming planet”. He emphasized the concepts of food security and nutrition while pointing out that the “nutritional security” becomes more and more relevant for humans in a changing world subject to new and increasing climatic and environmental threats. The keynote address highlighted the renewed commitment of the United Nations and UN organizations to deliver “as one” ensuring a coordinated approach to food security and nutrition. He also pointed out that since agriculture and aquaculture are deeply connected, both sectors need to focus on the nutrition security system. The abstract of Professor Swaminathan’s presentation is provided in Appendix 3.

11. Mr Jiansan Jia, Chief of the Aquaculture Service of the FAO Fisheries and Aquaculture Department made the second keynote presentation, on “Global Aquaculture development since 2000: progress made in implementing the Bangkok Declaration and Strategy for Aquaculture Development beyond 2000”. He discussed the progress made in the aquaculture sector globally since 2000 and analyzed how such progress addressed the provisions of the Bangkok Declaration and Strategy, which was adopted during the Aquaculture in the Third Millennium Conference in 2000. The abstract of Mr Jia’s presentation is in Appendix 4.

Global and regional reviews on aquaculture

12. Six regional reviews and one global synthesis on the current status and trends of aquaculture development were presented on the afternoon of 22 September 2010. The titles of the reviews and the names of the presenters are listed below.

- Aquaculture development in Africa: current status and future prospects, *Benedict Satia*
- Aquaculture development in Asia-Pacific: current status and future prospects, *Sena de Silva*
- Aquaculture development in Europe: current status and future prospects, *Laszlo Varadi*
- Aquaculture development in Latin America: current status and future prospects, *Carlos Wurman*
- Aquaculture development in the Near East: current status and future prospects, *Issam Krouma*
- Aquaculture development in North America: current status and future prospects, *Paul Olin*
- Global aquaculture development: a comprehensive analysis, *Imtiaz Ahmad*

Plenary lectures

13. Six thematic sessions were held from 23 to 25 September 2010. At the beginning of each session, one plenary lecture was organized. The aim was to provide an overview of the session. The six plenary lectures and their presenters are:

- Plenary lecture I: Resources and technologies for future aquaculture: a needs assessment for sustainable development, *Patrick Sorgeloos*
- Plenary lecture II: Sector management and governance in aquaculture: an overview, *Neil Ridler*
- Plenary lecture III: Maintaining environmental integrity through responsible aquaculture: constraints, opportunities and challenges, *Max Troell*
- Plenary lecture IV: Responding to market demands and challenges: making aquaculture a competitive food producing sector for the benefit of world consumers, *Lara Barazi-Yeroulanos*
- Plenary lecture V: Improving knowledge, information, research, extension and communication on aquaculture, *Gary Jensen*
- Plenary lecture VI: Enhancing the contribution of aquaculture to poverty alleviation, food security and rural development, *Modadugu Gupta*

Expert panel presentations

14. In each thematic session, three or four expert panel presentations were made after the plenary lecture. The titles of the thematic sessions and the expert panel presentations as well as the names of the presenters are listed as follows.

- *Thematic session I: Resources, technologies, and services for future aquaculture*
 - Expert panel presentation I.1: Responsible use of resources for sustainable aquaculture, *Barry Costa-Pierce*
 - Expert panel presentation I.2: Novel and emerging technologies: can they contribute to improving aquaculture sustainability? *Craig Browdy*
 - Expert panel presentation I.3: Providing high quality feeds for aquaculture and getting out of the fish meal trap: opportunities and challenges, *Albert Tacon*
- *Thematic Session II: Sector management and governance in aquaculture*
 - Expert panel presentation II.1: Improving aquaculture governance: what is the status and who is responsible for what? *Nathanael Hishamunda*

- Expert panel presentation II.2: Aquaculture and socio-economic growth and development: enabling policies and partnership for improved benefits, *Jolly Curtis*
- Expert panel presentation II.3: Investment, insurance and risk management for aquaculture development, *Clement Tisdell*
- *Thematic session III: Aquaculture and environment*
- Expert panel presentation III.1 Promoting responsible use and conservation of aquatic biodiversity for sustainable aquaculture development, *John Benzi*
- Expert panel presentation III.2: Addressing aquaculture-fisheries interactions through the implementation of the ecosystem approach to aquaculture (EAA), *Doris Soto*
- Expert panel presentation III.3: Improving biosecurity: a necessity for aquaculture sustainability, *Mike Hine*
- *Thematic session IV: Responding to market demands and challenges: ensuring food safety and quality, economic viability and sectoral diversity*
- Expert panel presentation IV.1: Facilitating market access for producers: addressing market access requirements, evolving consumer needs, and trends in product development and distribution, *Jonathan Banks*
- Expert panel presentation IV.2: Consumer assurance: market-based quality schemes, certification and traceability, eco-labelling, retailer specifications, *Lahsen Ababouch*
- Expert panel presentation IV.3: Organic aquaculture: the future of expanding niche markets, *Mark Prein*
- *Thematic session V: Improving knowledge, information, research & development (R&D) and regional cooperation in aquaculture*
- Expert panel presentation V.1: Investing in research, communication, training/extension for responsible aquaculture, *Brian Davy*
- Expert panel presentation V.2: Servicing the aquaculture sector: role of state and private sectors, *Michael Phillips*
- Expert panel presentation V.3 Progressing aquaculture in this knowledge economy through virtual technology and decision-making tools for novel management, *João Gomes Ferreira*
- Expert panel presentation V.4: Information and data needs: a strategy for improving aquaculture statistics, *Xiaowei Zhou*
- *Thematic session VI: Enhancing the contribution of aquaculture to poverty alleviation, food security and rural development*
- Expert panel presentation VI.1: Protecting small-scale farmers: a reality within a globalise economy? *Rohana Subasinghe*
- Expert panel presentation VI.2: Alleviating poverty through aquaculture: how can we improve? *David Little*
- Expert panel presentation VI.3: Addressing human capital development and gender issues in aquaculture sector, *Kyoko Kusakabe*
- Expert panel presentation VI.4: Supporting farmer innovations, disseminating indigenous knowledge and aquaculture success stories, *M.C. Nandeesh*

Invited guest lectures

15. Three invited guest lectures addressing several pressing issues in aquaculture were presented at the Conference. The abstracts of these lectures are provided in Appendix 3. The titles and presenters of the lectures are listed as follows.

- Invited guest lecture I: Is feeding fish with fish a viable practice? *Ulf Wijkstrom*
- Invited guest lecture II: The potential of aquaculture to improve human nutrition and health. *Shakuntala Haraksingh Thilsted*
- Invited guest lecture III: Coping with climate change: a real challenge for aquaculturists? *Sena de Silva*

Poster sessions

16. Totally, 144 paper abstracts were accepted by the Conference for poster presentation. These abstracts were published in the Conference handbook and/or displayed in the poster sessions of the Conference.

Side events

17. Four side events were organized on the evenings during the Conference. The titles and organizers of the side events are:

- *Side event 1*: Improving sustainability of seafood production and trade: opportunities and challenges, organized by GTZ and FAO
- *Side event 2*: Aquaculture Industry Dialogue, organized by the Thai Department of Fisheries in collaboration with the Norwegian Ministry of Fisheries and Coastal Affairs and FAO
- *Side event 3*: Introducing aquaculture research opportunities under the European Union's Seventh Framework Programme (FP7), organized by European Union (EU) Research Directorate-General DG-RTD and FAO
- *Side event 4*: Regional networking in aquaculture, organized by ANAF, NACA, NACEE, RAA and FAO

Outputs

Phuket Consensus

18. One of the key achievements of the Conference is the *Phuket Consensus: a re-affirmation of the commitment to the Bangkok Declaration*, which establishes the declaration on aquaculture development for the coming decade. The Phuket Consensus builds on and extends the *Bangkok Declaration and Strategy* adopted by the previous Global Conference on Aquaculture in 2000. While reaffirming commitment to the principles laid out in the *Bangkok Declaration*, the *Phuket Consensus* recommends additional actions to address contemporary priorities.

19. The Phuket consensus was developed through a series of discussions and consultations facilitated by the Conference's International Organizing Committee (IOC) that represents wide range of regions, expertise and regional and national organizations. The first draft of the consensus was developed by the IOC and discussed in an "Expert Workshop" held in Rome in January 2010. The second draft of the consensus developed by the IOC was further conferred with the experts at workshop in Hanoi in April 2010. The third draft, developed by the IOC, was shared among thirty experts representing government, social, technical, industry and academia spreading across the globe, and comments were solicited. In parallel, the draft was also informally shared widely among different stakeholders. Lastly, the final draft

consensus was distributed among all Conference participants along with twenty-three questions ranging from general to specific suggestions, comments and recommendations. All responses to these questions were synthesized into several clusters and presented at the final session of the Conference. After extensive discussions, the participants to the Conference adopted the Phuket Consensus. The complete text of the Phuket Consensus is provided in Appendix 4.

Report of the Conference

20. One of the publications emerging from this Conference is this *Report of the Phuket Conference on Aquaculture*. It provides a summary of the events, lectures, presentations and discussion that took place at the Conference. Preparation of this report is mainly based on the written materials submitted to the Conference (e.g. the abstracts of papers or lectures) and notes taken by Rapporteurs during the Conference sessions.

Other publications

21. The full texts of the six regional reviews and the global synthesis are documented in independent publications. The full texts of the 20 thematic reviews will be published as proceedings. The abstracts of all the presentations in the Conference were published in the Conference Handbook. The power-point slides and audio files of these presentations can be found at NACA's website: www.enaca.org/modules/aqua2010/presentations.php.

PART 2: SALIENT POINTS OF REGIONAL AND GLOBAL REVIEWS ON AQUACULTURE

Six regional reviews and one global synthesis on aquaculture development were presented and discussed at the Conference. The salient points of these presentations and discussion are summarized in the following sections.

Regional review: Aquaculture development in sub-Saharan Africa

Presenter: Benedict P. Satia

Rapporteurs: Matthias Halwart and Nathanael Hishamunda

Background

The contribution of sub-Saharan Africa to global aquaculture production remains very small but is increasing significantly. Between 1998 and 2008, there was a five-fold increase in production from 42 587 to 238 877 tonnes; the bulk of the production (near 95 percent) comes from fresh-water systems. The average yearly growth (APR) was 18.8 percent for the period and 19.90 percent for the years 2000 to 2008. This growth was mainly due to the emergence and intensification of private sector-led small and medium size enterprises, and the expansion of large commercial ventures. International awareness and interest in aquaculture spawned by the NEPAD Fish for All Summit in 2005 and implementation of the FAO Special Programme for Aquaculture Development in Africa (SPADA), also contributed to this development. There are opportunities for integrating aquaculture with other farming activities, for enhancing exports of high value species and for strengthening institutional capacity building. There is a need for research, technology development and investment to improve sustainability of existing farming systems. There is significant scope for improved human resources development, for better collaboration among farmers, and between science and practice and for international collaboration, within the region and with institutions and organizations outside the region.

Issues

The questions below were the focus of the presentation:

- Social and economic general background: agriculture and fisheries sector, fish consumption trends.
- General characteristics of the sector: main farming strategies, countries and regions, species, environments, integrated approaches.
- Resources, services and technologies: extension services, outreach, insurance, technology transfer, dissemination methodologies.
- Aquaculture and environment: climate change, land use, impact assessments, regulatory framework, public perception.
- Markets and trade: evolution, trends, processing, value chain, standards, certification, labelling.
- Contribution of aquaculture to food security, social and economic development.
- External pressures on the sector: climate change, civil unrest, political wills and political instability.
- The role of shared information: research, training, extension, dissemination and