

# Prospective analysis of aquaculture development

The Delphi method



**Cover photographs:**

*Clockwise from top left:*

Tilapia are transferred to a floating cage once they reach the juvenile stage. Credit: courtesy of Lake Harvest Aquaculture (Pvt) Ltd; An example of tropical cage culture technology using modern material. Credit: courtesy of Lake Harvest Aquaculture (Pvt) Ltd; Quality assurance means consistently checking products, ensuring cleanliness and hygiene at every juncture of the production process. Credit: courtesy of Lake Harvest Aquaculture (Pvt) Ltd; high-quality farmed tilapia requires excellent feed, such as this sampling manufactured to a specific formula from the finest cereal crops. Credit: courtesy of Lake Harvest Aquaculture (Pvt) Ltd

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The Delphi method

by

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# Preparation of this document

This study was undertaken as part of a larger project to evaluate the prospective future of aquaculture in different regions of the world. It complements national and regional studies of aquaculture that were part of the process but uses a different methodology: the Delphi method. Because aquaculture in much of the world is relatively new, and quantitative forecasts have underestimated the actual expansion of aquaculture, the Delphi method was seen as a means of identifying constraints to further expansion and also possible opportunities without quantification. It also offered a way to assess different policy options for implementing change.

# Abstract

In order to evaluate the major impediments to aquaculture development in different regions of the world and to indicate opportunities for expansion, a Delphi analysis was undertaken. The Delphi method is particularly useful for sectors such as aquaculture where discontinuities exist and where historic trends cannot be easily extrapolated into the future. The recent global expansion of aquaculture is unlikely to continue at the same pace; however, certain regions have underexploited resources and offer considerable potential. The Delphi method allowed experts in different regions to indicate where the potential and constraints are; they were also encouraged to offer their policy solutions.

Experts from Latin America and the Caribbean were particularly optimistic about opportunities for future aquaculture expansion in their region. With a plentiful natural resource base and sufficient demand for fish products, their principal concern was lack of financing and of human capacity. Other regions such as Eastern Europe were less sanguine partly because of problems with species or with external factors such as negative public perceptions towards aquaculture. However, there was a consensus in all regions that aquaculture should be encouraged. Reasons given ranged from the contribution of aquaculture to food security and poverty alleviation to the role of aquaculture in reducing pressure on wild fisheries.

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# Foreword

As an additional means of collecting expert advice, the Delphi method complements national and regional overviews of aquaculture development. Rather than focusing on historic trends or even the present situation, the Delphi approach encourages a more forward perspective into the future. Six regions of the world were covered accounting for more than 90 percent of present aquaculture output; only one region was excluded because of lack of participation. The conclusions of this study are specific to each region but they have relevance elsewhere.

I would like to particularly recognize the efforts of Mr Nathanael Hishamunda of the FAO Fisheries and Aquaculture Economics and Policy Division who led this important study and prepared its report. The invaluable contribution of Ms Florence Poulain, a consultant, and Mr Neil Ridler of the University of New Brunswick, who assisted with collating and analysing the information, is also recognized. Appreciation is also extended to those who willingly participated in the exercise and provided their insights. Mr Diego Valderrama and Ms Olivia Liberatori's editorial work in the manuscript is greatly acknowledged.

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# 1. Background and summary

## 1.1 INTRODUCTION

The purpose of this study was to assess the constraints and opportunities facing aquaculture in different regions of the world. Aquaculture output was worth US\$86 billion in 2006 compared to US\$27 billion in 1990, with almost half of the current global consumption of foodfish coming from aquaculture. Recognizing the increasing contribution of aquaculture to people's livelihoods and countries' economies worldwide, as well as the potential challenges to further development of the sector, the Committee on Fisheries Sub-Committee on Aquaculture of the Food and Agriculture Organization of the United Nations identified the need for a "Prospective analysis of aquaculture development" in its second session held in Trondheim, Norway, from 7 to 11 August 2003. The Prospective analysis seeks to supplement the National Aquaculture Sector Overviews (NASOs). In particular, the objectives of the analysis are to:

- (1) qualitatively forecast the future of regional and global aquaculture development;
- (2) determine and analyse important future events and policies which could affect aquaculture development regionally and globally; and
- (3) determine priority areas for action in aquaculture (regionally and globally).

The results of the analysis will serve as a basis for the discussion of the longer-term direction of the work of the Sub-Committee on Aquaculture.

There are marked regional differences; some regions such as Asia and Latin America, have enjoyed impressive growth while others, such as Africa and Eastern Europe, have experienced erratic expansion. For a sector that is relatively new outside Asia and whose growth has been consistently underestimated, reliance on historical trends to forecast future growth has its limitations. Given such discontinuities, an alternative approach to obtain forecasts is to survey experts for their opinions. The end result may not be quantitative in nature but it does give indications on what the constraints and opportunities for further development are. This was the approach adopted in this study. It is expected that the conclusions reached by the experts, particularly on issues where there was consensus, will be useful to policy-makers.

The first section of the report summarizes the methodology selected for the study – the Delphi method – as well as the overarching results of the analysis, at a global level. Subsequent sections concentrate on specific regions, with their constraints to development, opportunities and suggested policy initiatives.

