

# Application of Risk Analysis in Aquaculture Production: Outcomes of the Desk Study and the FAO/NACA Expert Workshop on Understanding and Applying Risk Analysis in Aquaculture Production

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As a food-producing sector, while aquaculture surpassed both capture fisheries and the terrestrial farmed meat production systems in terms of average annual growth rate, it has a number of biosecurity concerns that pose risks and hazards to both its development and management, and to the aquatic environment and society. Aquaculture faces risks similar to those of the agriculture sector. However, as aquaculture is very diverse (in terms of species, environments, systems and practices), the range of hazards and the perceived risks are complex.

Multiple objectives are driving the application of risk analysis to aquaculture. Foremost is for resource protection (human, animal and plant health; aquaculture; wild fisheries and the general environment) as embodied in international agreements and responsibilities. Of equal importance, the other drivers of risk analysis are: (i) food security, (ii) trade, (iii) consumer preference for high quality and safe products, (iv) production profitability and (v) other investment and development objectives.

Recognizing these issues and responding to requests emanating from the second and third sessions of COFI's Sub-Committee on Aquaculture [SCA] (SCAII, Norway,

2002; SCA III, India, 2006) to undertake studies on risk assessment, a project "Application of risk analysis in aquaculture production" was undertaken to: (1) review the (a) current state of knowledge and understanding on the risks involved in aquaculture development and management, and (b) application of risk analysis (hazard identification, risk assessment, risk management and risk communication) in aquaculture; (2) to prepare and compile a technical document that will provide practical guidance for policy makers and interested individuals on the use of various types of risk analysis in aquaculture as a useful decision-making tool for the sustainable development of the sector; and (3) organize an expert workshop to contribute to the process of better understanding the various risks involved in aquaculture so that they can be communicated well, more accurately assessed, and risk management measures appropriately identified to reduce the vulnerability of people who depend on aquaculture for their livelihoods and so that improvement in sector sustainability, profitability and efficiency can be achieved.

The project, undertaken in 2007 through a desk study and an expert workshop held in Rayong, Thailand in June 7-12, 2007, was funded under the Regular Programme and



through FAO's New Cooperation Agreement with Norway administered by the FishCode Programme of the FAO Fisheries and Aquaculture Department.



Forty-one aquaculture experts (policy-makers, risk analysis practitioners and technical experts in various aspects, e.g. diseases, food safety, genetics, environment, socio-economics, aquaculture insurance) representing various international, regional and national organizations and institutions in Asia, the Pacific, Oceania, Europe and North America, participated in the expert workshop.



The experts were divided into 3 working groups and tackled the following themes:

**Working Group 1** - Development of the contents of the *Manual on Understanding and Applying Risk Analysis in Aquaculture*



**Working Group 2** - Identification and grouping of hazard categories pertaining to ecological, environmental, genetic, pathogen and food safety aspects

**Working Group 3** – Identification of hazards with emphasis on social, financial/economic and cultural aspects



The major outcomes of the desk study and expert workshop include a better understanding of the risk analysis process and its application to seven major risk categories (i.e. pathogen risk analysis, food safety and public health, genetics, application of risk analysis to genetic issues and environmental issues, ecological risk assessment, introduced marine species risk assessment, financial risk analysis, social risks in aquaculture) and two Fisheries Technical Papers (FTPs).



The desk study and the expert workshop recognized that the main purpose of risk analysis is to provide a structured means of assessing risks to or from a sector and communicating these risks in order to guarantee a uniform and transparent process of decision making or regulatory control. It was also recognized that risk analysis is undertaken in any circumstance where a decision must be made in the face of significant uncertainty and where potential harm exists. Risk analysis need not be an overly complicated process. It can be undertaken as a fully quantitative assessment of probabilities or alternately, can be based on qualitative assessment of perceptions. Risk analysis as a process should be considered as a highly flexible tool that can readily be adapted to various situations.

The first FTP contains two parts. Part 1 consists of 14 technical papers presented during the expert workshop, contributed by 23 specialists and peer-reviewed by nine experts. The contributed papers include general principles of risk analysis, application of risk analysis to the identified seven risk categories (see above) and three related papers on ecological risk assessment guidelines of marine fish aquaculture, aquaculture insurance industry risk analysis process and risk analysis in small-scale shrimp farmers in India. Part 2 contains the highlights of the FAO/NACA Expert Workshop on Understanding and Applying Risk Analysis in Aquaculture Production contributed by 41 experts.

The second FTP is a Manual for Understanding and Applying Risk Analysis in Aquaculture Production. The purpose of the manual is to provide an overview of the risk analysis process as applied to aquaculture production and to demonstrate the variety of ways in which risk can manifest in aquaculture operations



and management. The manual is intended to promote wider understanding and acceptance of the applications and benefits of risk analysis in aquaculture production and management that could lead to greater harmonisation between members in the use of risk analysis. It is intended for regulators and policy makers of FAO Member States to aid in an understanding of the

application of risk analysis in this fast growing sector of the economy. While examples are provided, it should be noted that the manual is not a recipe book to be followed for instant success. As risk analysis and resulting guidelines are typically developed in an explicit context, a good understanding of the risk fundamentals will be required in order to be adapted to a new situation. Risk analysis capacity and capability in relation to aquaculture operations should be developed in FAO Member States.

These two publications are expected to be in print by third quarter of 2008. Further information can be obtained by writing to [Melba.Reantaso@fao.org](mailto:Melba.Reantaso@fao.org).

## NEW STAFF PROFILE



The Government of the Kingdom of Saudi Arabia (KSA) and FAO has entered into a new Unilateral Trust Fund (UTF) Agreement for the next five years starting 2007 until 2012. This present UTF Agreement between KSA and FAO is composed of 13 different projects. One of these projects (UTFN/SAU/017/SAU) is on “Support to the Fish Farming Center in Jeddah”. The long-term objective of UTFN/SAU/017/SAU is to upgrade the technical capability of the Fish Farming Center as an institution to support the increasing aquaculture activities in the country. FAO’s role in the present project is to provide the technical assistance

to meet the project objectives. Dr. Felix G. Ayson joined FAO on 04 August 2007 as Chief Technical Adviser (CTA)/Aquaculture Expert for the Project.

Felix comes from the Philippines and holds a Doctor of Science degree in Zoology with specialization in Fish Physiology/Endocrinology. Before joining FAO, Felix was a Researcher at the Aquaculture Department of the Southeast Asian Fisheries Development Center (SEAFDEC AQD) in the Philippines where he worked for the past 18 years. SEAFDEC AQD is an international research institution that does scientific research on aquaculture

and fisheries. While in SEAFDEC AQD, Felix held various positions, among them as Head of the Nursery Section, Program Leader of the Marine Fish Program, and Manager of the Multi-species Fish Hatchery and the Integrated Fish Broodstock and Hatchery Complex.

Felix is stationed in the Fish Farming Center in Jeddah, Saudi Arabia. He can be reached by email at [Felix.Ayson@fao.org](mailto:Felix.Ayson@fao.org)