



GENERAL FISHERIES COMMISSION FOR  
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COMMISSION GÉNÉRALE DES PÊCHES  
POUR LA MÉDITERRANÉE



**Committee on Aquaculture (CAQ)**

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**Brief notes on regional biosecurity and aquatic animal diseases**

**BACKGROUND**

1. These notes were presented and discussed during the 5<sup>th</sup> Coordinating Meeting of the Working Groups (CMWG) of the Committee on Aquaculture (CAQ) of the General Fisheries Commission of the Mediterranean (GFCM) held in Rome (Italy) at GFCM premises. The considerations made by the CMWG are also reported in the document.

**INTRODUCTION**

2. From a FAO perspective, biosecurity is defined as “*a strategic and integrated approach that encompasses the policy and regulatory frameworks for analysing and managing relevant risks of the sectors dealing with: human life and health (including food safety); animal life and health (including fish); plant life and health; environment (FAO, 2009<sup>1</sup>)*”. Biosecurity describes the concept, process and objective of managing in a holistic manner biological risks associated with food and agriculture, with “agriculture” in its broadest sense and including: food production and processing in relation to food safety, the introduction of plant pests, animal pests and diseases, and zoonoses, the introduction and release of genetically modified organisms (GMOs) and their products, and the introduction and safe management of invasive alien species and genotypes (FAO, 2009).

3. It is widely recognized that aquaculture presents a number of biosecurity concerns that pose risks and hazards to both its development and management, and to the aquatic environment and society. However, there are also risks to aquaculture posed by the physical, social and economic environment in which it takes place (FAO, 2008<sup>2</sup>). Table 1 reports some of the risks associated *from* and *to* aquaculture.

<sup>1</sup> FAO. 2009. Report of the FAO Workshop on the Development of an Aquatic Biosecurity Framework for Southern Africa. Lilongwe, Malawi, 22–24 April 2008. FAO Fisheries and Aquaculture Report. No. 906. Rome, FAO. 2009. 55p.

<sup>2</sup> Bondad-Reantaso, M.G.; Arthur, J.R.; Subasinghe, R.P. (eds). Understanding and applying risk analysis in aquaculture. FAO Fisheries and Aquaculture Technical Paper. No. 519. Rome, FAO. 2008. 304p.

Table 1: Risks associated *from* and *to* aquaculture (Source: Arthur, 2008<sup>3</sup> - modified)

Examples of risks to society and the environment from aquaculture	Examples of risks to aquaculture from society and the environment
<b>Environmental risks</b>	
<ul style="list-style-type: none"> <li>• pollution from feeds, drugs, chemicals, wastes</li> <li>• alteration of water currents &amp; flow patterns</li> </ul>	<ul style="list-style-type: none"> <li>• severe weather patterns</li> <li>• pollution (e.g. agricultural chemicals, oil spills)</li> </ul>
<b>Biological risks</b>	
<ul style="list-style-type: none"> <li>• introduction of invasive alien species, exotic pests &amp; pathogens</li> <li>• genetic impacts on native stocks</li> <li>• destruction/modification of ecosystems and agricultural lands (mangrove deforestation, salination of ricelands)</li> </ul>	<ul style="list-style-type: none"> <li>• pathogen transfer from wild stocks</li> <li>• local predators (seals, sharks etc.)</li> <li>• toxic algal blooms, red tide</li> </ul>
<b>Financial risks</b>	
<ul style="list-style-type: none"> <li>• failure of farming operations</li> <li>• collapse of local industry/sector</li> </ul>	<ul style="list-style-type: none"> <li>• market changes</li> <li>• inadequate financing</li> <li>• currency fluctuations</li> <li>• emergence of new competitors</li> </ul>
<b>Social risks</b>	
<ul style="list-style-type: none"> <li>• displacement of artisanal fishers</li> </ul>	<ul style="list-style-type: none"> <li>• negative image/press</li> <li>• lack of skilled manpower</li> <li>• competition for key resources from other sectors</li> <li>• theft, vandalism</li> </ul>
<b>Human health risks</b>	<b>Operational risks</b>
<ul style="list-style-type: none"> <li>• food safety issues</li> </ul>	<ul style="list-style-type: none"> <li>• poor planning</li> <li>• poor design</li> <li>• workplace injuries</li> </ul>

4. In aquaculture, biosecurity is a collective term which refers to the concept of applying appropriate measures – for example proactive disease risk analysis - to reduce the probability of a biological organism or agent spreading to an individual, population, or ecosystem, and to mitigate the adverse impact that may result (FAO, 2009).

5. Biosecurity threats in aquaculture include any disease which could potentially cause losses in a farm. Entry points for spread of diseases comprise animal movements, international trade/globalization (trans-boundary aquatic animal diseases), aquaculture inputs: (e.g. seed, feed), water, birds, fomites (e.g. equipment, such as nets and siphon hoses), workers. A comprehensive list of global diseases is published by the World Organization for Animal Health (OIE) whilst regional list of diseases are provided by regional organizations e.g. the Network of Aquaculture Centres in Asia-Pacific (NACA). Each country also publishes a list of diseases which have occurred in national aquaculture farms.

6. According to the OIE, biosecurity conditions include the three following requirements: (1) the disease, including suspicion of disease, is compulsory notifiable to Competent Authority; (2) an early detection system is in place within the zone or country; (3) import requirements to prevent the introduction of disease into the country or zone, as outlined in the Aquatic Code, are in place (OIE,

<sup>3</sup> Arthur, J.R. 2008. General principles of the risk analysis process and its application to aquaculture. In M.G. Bondad-Reantaso, J.R. Arthur and R.P. Subasinghe (eds). Understanding and applying risk analysis in aquaculture. FAO Fisheries and Aquaculture Technical Paper. No. 519. Rome, FAO. pp. 3–8.

2011<sup>4</sup>). Furthermore OIE defines a Biosecurity Plan as “a plan that identifies significant potential pathways for the introduction and spread of disease in a zone or compartment, and describes the measures which are being, or will be, applied to mitigate the risks to introduce and spread disease, taking into consideration the recommendations in the Aquatic Code. The plan should also describe how these measures are audited, with respect to both their implementation and their targeting, to ensure that the risks are regularly re-assessed and the measures adjusted accordingly”.

7. The 29<sup>th</sup> Committee on Fisheries (COFI<sup>5</sup>) underlined the necessity for improving biosecurity in aquaculture and stressed the importance of understanding the interactions between wild capture fisheries and aquaculture as well as cooperation with other international organizations involved in biosecurity issues.

8. During the 30<sup>th</sup> COFI held in 2012<sup>6</sup>, the Committee reiterated the need to assist Members to improve biosecurity governance, develop capacity in risk analysis, and create networks of aquatic animal health experts. The Committee also emphasized the need to enhance collaboration between FAO and the World Organisation for Animal Health (OIE).

9. The GFCM recognizes the importance of biosecurity and aquatic animal diseases: as reported (GFCM, 2011<sup>7</sup>), sometimes aquaculture farms face pathologies problems representing significant constraints in their management. The loss of production for some marine species caused by a series of pathogens factors were recently reported by producers with heavy consequences on availability of products in the market, and therefore jeopardizing the sustainability of the sector. It was concluded that cooperation in managing aquaculture fish's diseases should be considered, including (i) the responsible use of drugs and vaccines and (ii) the use of risk assessment as management tools with regard to disease prevention.

10. FAO (2010<sup>8</sup>) identified possible solutions to biosecurity risks in aquaculture as follows:

- **Policy options (including regulatory and implementation frameworks):** identifying a competent authority and oversight bodies and agreeing on interagency coordinating responsibilities; making biosecurity an element of national aquaculture development programmes; establishing regulatory processes and the appropriate infrastructure to enforce them; and enhancing compliance with regional and international treaties and instruments through effective implementation of national strategies and national policies.
- **Knowledge base:** Application of risk analysis supported by research, databases and other vital sources of information and knowledge so that it can effectively support biosecurity assessments, surveillance, diagnostics, early warning, emergency preparedness and contingency planning.
- **Capacity building:** Dealing with biosecurity risks is a common responsibility that should be shared among relevant authorities and stakeholders along the aquaculture value chain. Therefore, capacity building in risk analysis and adaptive management at all levels – from farms to oversight bodies of the public and private sectors – should be part of an overall programme so that threats and uncertainties from new species and innovations can be assessed rapidly, and surveillance programmes implemented.

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<sup>4</sup> OIE. 2011. Aquatic Animal Health Code. Available online at <http://www.oie.int/international-standard-setting/aquatic-code/access-online/>

<sup>5</sup> FAO. 2011b. Report of the twenty-ninth session of the Committee on Fisheries. Rome, 31 January–4 February 2011. FAO Fisheries and Aquaculture Report. No. 973. Rome, FAO. 2011. 59 pp.

<sup>6</sup> FAO. 2012. Report of the thirtieth session of the Committee on Fisheries. Rome, 9–13 July 2012. FAO Fisheries and Aquaculture Report. No. 1012. Rome, FAO. 59 pp.

<sup>7</sup> GFCM. 2011. Trend and issues of marine and brackish Mediterranean aquaculture. Rome, Italy, 8-10 March 2011. GFCM:CAQVII/2011/2. 9p.

<sup>8</sup> FAO. 2010. The State of World Fisheries and Aquaculture 2010. FAO: Rome, Italy.

- **Investment in infrastructure, capacity, regulatory frameworks and partnerships:** Effective, coordinated and proactive biosecurity systems are the product of science based knowledge and practices used within effective regulatory frameworks backed by sufficient resources for enforcement. More investment is needed in: biosecurity infrastructure; human capacity for assessing, managing and communicating risks; regulatory frameworks for controlling risks; and public and private sector partnerships for identifying, monitoring and evaluating risks. Regional and international cooperation should be fostered to pool resources and share expertise and information. At regional or national levels, the institution mandated to ensure biosecurity would be well served by putting emergency preparedness with advanced financial planning as its core function.

#### **CONSIDERATIONS BY THE 5<sup>TH</sup> CMWG**

11. The above issues on aquatic animal health and biosecurity were discussed at the 5<sup>th</sup> CMWG of CAQ and hereunder reported. Consideration was made on the regional situation for implementing legislations or regulations about these subjects in the Mediterranean and Black Sea countries which is not yet clear. The CMWG stressed that aquatic animal health programmes and biosecurity measures should be considered and harmonized at regional level to minimize the risks of pathogen spreads and newly emerging disease which will continue to threaten sustainability of aquaculture sector and biodiversity. The CMWG also highlighted that within animal health programmes, risk analysis is an important component and should be addressed and developed at country level, together with emergency response systems (national, regional and international levels), and enforcement of public health services.

12. The CMWG suggested that the following issues should be considered at Mediterranean and Black Sea level: i) collection of information on: aquatic animal programmes, legislation and policy, emergency plans, diagnostic, quarantine and inspection services, disease surveillance, monitoring and reporting, national pathogen lists, in GFCM countries, and: ii) the means to implement them within a planned regional strategy.