



# Occupational health and safety in the aquaculture industry – a global review

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RS Standards is at the forefront of chain standards development and improvement frameworks and is leading initiatives in sustainability, fisheries management, fishing and supply chain standards internationally with leading organisations.

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## Executive summary

Every 15 seconds, a worker dies from a work-related accident or disease. Every day, 6,300 people die as a result of occupational accidents or work-related diseases – more than 2.3 million deaths per year. Annually, 317 million accidents occur on the job; many of these resulting in extended absences from work [5] (see reference page 38).

This report identifies a set of indicators that influence occupational health and safety (OH&S) in aquaculture. It reviews some of the latest published literature on OH&S in aquaculture and uses a set of desk top country reviews to help identify the role of different indicators and their importance.

Aquaculture, the farming of aquatic organisms (including fish, molluscs, crustaceans, and aquatic plants), is the fastest growing food sector in the world. It occurs in all regions, across all economic settings, from artisanal to multi-national, in all environments and even where water is a scarce commodity. In 2018, global aquaculture production of animals (fish and invertebrates) was 82.1 million tonnes (Mt), and aquatic algae 32.4 Mt. Total fish production is expected to expand to 204 Mt in 2030. Aquaculture production is projected to reach 109 Mt in 2030, an increase of 32% (26 Mt) over 2018 [2]. 20 million people are directly employed in aquaculture and another 60 million in downstream seafood occupations. There is a wide range of occupational activities that reflects the diverse forms of aquaculture, from basic labouring to seafaring to technical to managerial. Employment is dominated by small-scale aquaculture producers residing in Asia.

This report focuses on the evidence for OH&S incidents in the global aquaculture industry and evidence on the effectiveness of OH&S interventions to reduce such incidents. OH&S hazards in aquaculture have been categorised as falling into six categories covering safety, physical, chemical, biological, ergonomic, and psychosocial aspects [1].

While many studies have focused on the environmental impacts of aquaculture, and more recently an increase in attention on social issues such as child and bonded labour, by comparison there has been less attention on OH&S risks to aquaculture workers, particularly for low- and middle-income countries (LMICs). Indeed, a relatively recent (2017) Food and Agriculture Organization (FAO) project that reviewed the evidence on OH&S incidents in peer-reviewed and grey literature found that very few studies (3%) were reported from LMICs. Most studies focused on the OH&S data for operations farming fish and crustaceans and less so for those farming molluscs and aquatic plants. Preventive approaches, based on the hierarchy of control measures to reduce health risks associated with hazardous exposures, occur mainly in well-resourced high-income countries.

The FAO project separated OH&S outcomes into two groups: occupational diseases and disorders and injury-causing accidents. Musculoskeletal disorders were by far the most common, followed by respiratory disorders, which may indicate greater exposure to various chemicals during bath treatments of stock. The main injuries were caused by falls (including slips) and object blows. Net entanglement and skin injuries were also fairly common incidents.

It is hypothesised that the FAO findings may underestimate occurrence of many occupational injuries and diseases in the global aquaculture industry, due to underreporting, particularly from LMICs. The granularity of reporting systems in many countries does not allow data extrapolation – at best, reporting of incidents in the aquaculture industry are aggregated within agriculture / fisheries / forestry-type reported data. Types of accidents / incidents are not reported sufficiently and there is no standardised approach for their reporting. Even when there is a mandate for OH&S reporting, access to this data was problematic.

The lack of management / regulation governing small-scale aquaculture operations, mean there are considerable uncertainties on the exposure of workers on smaller-scale farms to OH&S hazards. The large number of undocumented workers in the informal work sector in regions such as Asia and Africa are likely to be more vulnerable to poor work conditions and worker violations and hence at increased risk of exposure to OH&S hazards.

This review identified the higher-level indicators that influence the risk landscape of health and safety in aquaculture settings. The seven indicators identified were:

- country governance
- country regulations and their implementation
- production system type and pace of aquaculture development
- commercial large scale versus small-scale
- operating environment
- social-cultural factors; and
- extent of safety systems and third-party certification.

However, currently there is limited evidence that supports the relative influence of any of these indicators and further investigation is needed to explore how they interact with one another and how they effect OH&S risks and risk outcomes in aquaculture.

The rapid growth of the aquaculture sector has meant that policy and regulation can lag. The capacity for countries to develop, implement and enforce OH&S regulations varies significantly and is often correlated with the level of economic development. The FAO has emphasised the need for improved aquaculture governance globally to reduce the likelihood of what they term ‘social dumping’, where labour codes may be jeopardised as countries compete to remain attractive to companies and foreign investments. To improve aquaculture governance, the FAO has suggested a range of actions from improving monitoring and enforcement, greater conditions on licenses and leases, limiting ownership size and improved governance on foreign ownership participation.

Business level OH&S interventions can fall into the following categories:

- hazard control at source – involves measures aimed at removing or substituting a hazard
- hazard control along path – this group of interventions comprises occupational measures aimed at reducing exposure to the hazard along the path of exposure; and
- hazard control at the worker – interventions that act at the level of the worker.

Through third-party certification, current aquaculture schemes provide a high level of assurance that higher operating standards are achieved in practice. Where certification programmes contain criteria for worker welfare, this provides a very useful framework for raising awareness and improving practice within a business. It also promotes activity on where improvements can be made and this may help the overall business culture for OH&S.

## Recommendations

The research identifies stark differences in the availability of OH&S information associated with aquaculture across geographic regions.

Some regions, typified by a higher development status, have progressed more comprehensive OH&S systems (including policy, regulation, reporting and accountability) applicable across all work sectors and some have progressed implementing and reporting tools specific to their aquaculture sectors. Other regions have far less mature and identifiable frameworks and scant or no available data for evaluating the performance of OH&S in aquaculture. Where reporting is evident, data is often amalgamated and not sector specific.

The lack of comparative data indicates a clear need for a comprehensive framework for evaluating and reporting the current status of OH&S in aquaculture that can be applied consistently at country, regional and /or aquaculture systems level. Its development would require an international approach with multi-stakeholder and disciplinary inputs (government, industry, institutional, NGO, academia, etc.). It would need to:

- define and agree universal standards and metrics. This review identifies some potential indicators that influence OH&S performance at country and sector level (e.g. governance, policy, pace of aquaculture development, industrialisation, environmental setting). These would need further development and consensus building across the group, co-ordinated by an independent organisation
- create a mechanism for its application and reporting. The approach would need a defined process to ensure independence, credibility, and repeatability and build upon current established standards for consistency in data collection (e.g. UN ILO); and
- establish endorsement from the major international organisations associated with labour and aquaculture (e.g. UN ILO, FAO, WHO).

A framework is essential in the creation of an evidence base collection system. It can operate as a benchmark process and allow OH&S performance to be measured consistently. Overtime, it would allow the impact and success of intervention programmes to be measured against standardised performance metrics for OH&S.

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