



## AQUACULTURE AND ISSUES OF SUSTAINABILITY

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Aquaculture sustainability is defined in terms of both 'strong' and 'weak' approaches and the relevance of this dichotomy is explained with regard to sustainable market opportunities and global food security. Identifying useful boundaries for assessing sustainability is a challenge. Global value chains link production and consumption of farmed seafood across continents and a growing international trade increasingly substitutes for diminishing and inconsistent supplies from wild stocks. Several factors challenge the sustainability of aquaculture in tandem with its rapid rise to importance in supporting aquatic food security.

Modern commercial aquaculture systems remain relatively open to their immediate environments and, since they are resource intensive, are increasingly dependent on distant sources of feed and other inputs. The openness or porosity of production systems raises issues of both pathogen exclusion and biodiversity impacts. A key issue is the level to which isolation from the 'environment' is possible or desirable. Strategies to manage interactions to achieve a balance between the needs of the production system, the species farmed and the integrity of the environments that support them are presented and discussed. Pressures on water and land resources are forcing both intensification and stimulating integration, although these may be contradictory approaches.

Tracing sustained seafood supplies to availability of basic nutrients and energy suggest the vulnerability of emerging aquatic food production systems. The challenges of meeting energy and nutrient needs in the coming decades will stimulate emergence of ever more efficient systems but competitiveness with other sectors of food production will be critical.

The EC FP7 research project SEAT (Sustaining Ethical Aquaculture Trade) is using Life Cycle Analysis as a core tool to assess the broader impacts of aquaculture on the global environment, allied to detailed modelling of local environmental impacts. In addition, aspects of particular importance such as water use and social and economic impacts require assessment both local to production and along the value chain. The ethical dimensions and contradictions of Asian production systems based on trade with Europe are considered.

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