

Recommendations from the Thematic Sessions Global Conference on Aquaculture 2010

Thematic Session I - Resources, services, and technologies for future aquaculture

Expert Panel Presentation I.1: Responsible use of resources for sustainable aquaculture

1. To increase the profitability of recirculating aquaculture systems, accelerate the development and use of renewable energy systems.
2. To avoid land constraints, accelerate the development of integrated cage culture systems such as biculture, polyculture, and submerged systems in open waters.
3. Develop and disseminate integrated fed and non-fed aquaculture systems that have the multiple uses of water for increased productivity and profitability of both terrestrial and aquatic foods and energy.
4. Use of indicators such as life cycle assessments, and other tools (e.g., fish in/fish out ratio) will assist in measuring and communicating the sustainability of aquaculture in comparison with other food production sectors.
5. There is a need for wider and effective dissemination of innovations in aquaculture.

Expert Panel Presentation I.2: Novel and emerging technologies: can they contribute to improving aquaculture sustainability?

6. Apply risk analysis (assessment, management, communication) approaches to implementation of technology advances focusing on the risks/benefits of the improvement rather than the means of achieving it.
7. Focus research and encourage multidisciplinary collaboration by facilitating consensus on goals and objectives and then developing measures and metrics to quantify progress towards desired outcomes. The follow up to evaluate progress, dissemination and outcomes.
8. Extend technology advances emanating from industrial scale aquaculture to benefit small and medium scale sectors. For example, encouraging clustering to improve access to technologies for health management, genetic improvement, feed formulation/management etc.

Expert panel presentation I.3: Aquaculture feeds: addressing the long term sustainability of the sector

9. Reduce developing country dependence upon imported feed ingredient sources within compound aquafeeds by encouraging outreach and training opportunities to maximize the use of locally available feed ingredient sources and nutrient waste streams as feed inputs, especially those feed ingredient sources that can be sustainably produced and grown with the sector.

10. Assist and train resource poor farmers and small/medium-scale local feed producers by encouraging the use of improved cost effective feed preparation and feed management techniques.
11. Encourage diversification of sustainable feed resource utilization by enhancing knowledge of nutritional requirements and nutrient availability and facilitating agriculture/aquaculture dialog and innovation.

Thematic Session II - Sector management and governance in aquaculture

Expert panel presentation II.1: Improving aquaculture governance: what is the status and who is responsible for what?

1. Recognizing the importance of good governance in aquaculture development and noting that insufficient information inhibits efforts to formulate adequate governance models, Conference recommended that FAO accelerates its efforts to prepare “Guidelines for Aquaculture Governance” which contain, *inter-alia*, information on decision making under scarce-information situations and expressed the need to document cost-effective means of enforcing regulations, a burning issue in developing countries.
2. Recognizing the value of sharing national experiences in Aquaculture governance and noted the urgent need for countries, NGOs and development agencies and/or organizations, to collect and disseminate positive and negative experiences on the ground including co-management, conflicts resolution, self-regulation, integrated coastal zone management, etc., and countries to improve their national institutional capacity and consider creating lead agencies to oversee and coordinate the development of the sector.

Expert panel presentation II.2: Aquaculture governance and socio-economic growth and development: enabling policies and partnerships for improved benefits

3. Underlining the importance of quantitative socio-economic impacts of aquaculture in obtaining political and financial supports which are required for adequate development of the sector and noting the limited number of case studies in this area, the Conference recommended to conduct a systematic review of Aquaculture’s socio-economic impacts from a global perspective and to accelerate the development of a user-friendly model to quantify these impacts.
4. Noting the need for assessing the level of achievement of expectations of the Phuket Consensus up to the next aquaculture forum and emphasizing the need to develop quantifiable and other forms of indicators for this purpose, the Conference indicated that the documentation of work done in similar disciplines could be a departure point.

5. Recognizing the importance of improving aquaculture's contribution to the socio-economic wellbeing of poor communities, especially in rural areas and observing the various means of achieving this goal and noting that the limited financial resources remained one of the main hindrances to this improvement, the Conference recommended that practical ways and means be found to allow resource-limited farmers to access credit to cover their investment and/or operating needs.

Expert panel presentation II.3: Investment, insurance and risk management for aquaculture development.

6. Underlining the need to increase and make investment more productive in order to make the growth of aquaculture production sustainable, the Conference recommended that countries increase investment in research and development to support greater intensification of aquaculture production and in human capacity development.
7. Considering the limited access to insurance by small- and medium-scale farmers threatens the development of the sector, the Conference recommended that, countries adopt a multi-pronged policy approach in order to reduce risks and uncertainty in aquaculture, which will require to think of measures of extending insurance coverage such as the Asian Aquaculture Insurance Pool, and developing techniques that lower risks while increasing the knowledge available to aquaculture farmers. In this regard, the Conference further emphasized the need for a concerted action in gathering and disseminating success and failure stories in aquaculture risk management and aquaculture insurance schemes that address the needs of small-scale and medium-scale farmers.
8. Considering the urgent need to help small-and medium-scale farmers to access credit and reiterating that, because individual risks incurred in investing is higher than the collective risk, government subsidies for aquaculture investment are justified from an economic point of view and their use to assisting this category of farmers to reduce insurance costs could be considered, the Conference noted that the role of international and regional development banks in terms of supporting the sustainable development of the aquaculture sector needs to be strengthened as the access to credit, micro-finance and insurance services could be greatly increased by making funds available for these services; and that the establishment and provision of these services could benefit from the guidelines produced by FAO and others in the last decade.
9. Noting the extent of difficulty in insuring farmers against all risks, especially under very-limited-resource conditions, called on farmers to assess risks and set priorities when seeking an insurance service, the Conference recommended that risk management tools in aquaculture, which address a large variety of risks (production infrastructure, production, economic, social, environmental, pathogens, food safety and genetics) and have been developed recently, be promoted and their application widely encouraged.

Thematic Session III - Maintaining environmental integrity through responsible aquaculture

Expert panel presentation III.1: Promoting responsible use and conservation of aquatic biodiversity for sustainable aquaculture development.

1. Improve information on the state of aquatic genetic resources, including wild populations, cultured strains, the state of application, and benefits of, genetic technologies; and the status of, and impacts on, wild populations including the effectiveness of technologies designed to mitigate such effects.
2. Better focus investment in genetic R&D on establishing sound genetic resource management programs with clear objectives, and which provide the necessary foundation for application of a variety of other technologies and encourage their application to a) production and b) wild aquatic genetic resource protection.
3. Encourage exchange among the diverse groups needed for better understanding of aquaculture and conservation activities and improved technology transfer by, e.g., continued dissemination of sound resource material and advice already available.
4. Strengthen the foundation for science based risk analysis and control (through increased understanding, knowledge, technology development and regulatory capability) of interactions between wild and cultured stocks. This can be achieved by increasing the breadth and depth of case studies and encouraging the application of the precautionary approach.
5. Access to and exchange of aquatic genetic resources has played a major role in the rapid growth of aquaculture. Unlike terrestrial plant and animal genetic resources that were domesticated thousands of years ago and maintained by traditional knowledge, aquatic organisms have only been domesticated recently. A significant portion of that process has been accomplished using high levels of technological and financial input by private and public/private partnerships in areas far away from the native range of the species concerned. Access/exchange must be continued with adequate risk analysis. In formulating policies and laws the unique character of aquatic genetic resources must be incorporated.

Expert panel presentation III.2: Addressing aquaculture- fisheries interactions through the implementation of the ecosystem approach to aquaculture (EAA)

6. Considering that aquaculture development and management should take into account of the full range of ecosystem functions and services, and should not threaten the sustained delivery of these to society aquaculture should improve human well-being and equity for all relevant stakeholders and should be developed in the context of other sectors, policies and goals.
7. To use risk assessment tools in planning, especially for culture based fisheries development and to encourage closer co-operation between aquaculture and fisheries institutions to coordinate fish production using the ecosystem approach to aquaculture and ecosystem approach to fisheries.

Expert panel presentation III.3: Improving biosecurity: a necessity for aquaculture sustainability

8. Aquaculture development (intensification, diversification and trade) brings new challenges to sustainable development of the sector; biosecurity issues become a major concern
9. Disease intelligence, research, technologies and information have greatly improved – need to involve especially farmers/producers into the equation for effective implementation
10. Need to keep pace with species, systems, technologies and environments in order to understand/determine appropriate biosecurity measures that can be put in place at every step of the culture cycle/value chain at all levels.
11. Efforts should be focused on prevention, and maintaining healthy and safe aquatic production
12. Risk analysis is an important decision-making tool but should be supported with infrastructure, human capacity and information
13. There is a clear need for establishing and/or improving surveillance programmes and diagnostic services to detect and identify the arrival and spread of pests and diseases; timely assessment of the threats from new or expanding species; rapid response to eradicate new pests and diseases before they establish and spread; standardization of science-based identification of all risk pathways and high-risk organisms, and implementation of pre-border, border and post-border measures to prevent pests and diseases from entering the country; national frameworks to regulate, manage and control biosecurity; and provision of infrastructure, human capacity, research and information to implement the above.

Thematic Session IV - Responding to market requirements and challenges: making aquaculture a competitive food producing sector

Expert panel presentation IV.1: Facilitating market access for producers: addressing market access requirements, evolving consumer needs, and trends in product development and distribution

1. Governments should promote integration of the small-scale aquaculture sector into the globalized market economy and increase its competitiveness by facilitating sectoral cooperation, collaboration and sharing of experience, including their ability to benefit from economies of scale in purchasing, processing, certification and marketing.

2. With a growing share of seafood consumption being represented by aquaculture production, the aquaculture sector will increasingly influence price formation, production and market development in the overall fisheries sector. This will present opportunities to producers, but in order to be successful, companies will need to analyze, interpret and adapt to changes in customer and consumer needs. To this purpose, policy makers are encouraged to promote transparency with improved data collection and dissemination throughout the value chain.

Expert panel presentation IV.2: Consumer assurance: market based quality schemes, certification and traceability, eco-labelling, retailer specifications

1. Strengthen the capacity of developing countries to meet codex standards and guidelines. This may reduce some of the drivers for further proliferation of private standards.
2. There is a need for dialogue between private and public standard setting bodies. Private standard setting bodies should be encouraged to participate in the codex process and harmonize their standards with codex standards.
3. Technical and scientific capacity of developing countries to demonstrate equivalence of their food safety management systems with market based requirements.
4. There should be increased stakeholder participation, particularly of small producers and small food business operators in the process of development of market-based standards.
5. Private standard setting bodies should ensure proper distribution of benefits among the various stakeholders in the supply chain.

Expert panel presentation IV 3: Organic aquaculture: the future of expanding niche markets

1. There is a need to increase in efficiency of value chains. There are bottlenecks in feed sector contract farming should be organised for ingredients.
2. Conduct workshop with stakeholders to address “feed bottleneck” problem and arrange joint ventures between retailers to producers.
3. Efforts should be made for further education of consumers on organic products and necessary policy support should be created through national programs.
4. There is a need for benchmarking and harmonization of standards and may be appropriate to look into the opportunities for merging of “Fair Trade” and “Organic” certification.
5. Improved applied research and development and demonstration facilities should be created and micro-insurance schemes should be established.

Thematic Session V - Improving knowledge, information, R&D and regional cooperation in aquaculture

Expert panel presentation V.1 Investing in research, communication, training/extension for responsible aquaculture

1. Close gap between stakeholders to accelerate multiple forms of knowledge transfer and foster stronger demand-driven and relevant research
2. Improve learning capabilities and competency on how to find, access and interpret knowledge
3. Support strengthened knowledge transfer processes e.g. through extension and knowledge brokering; knowledge “platforms/brokers” allow improved interpretation and synthesis of knowledge.
4. Promote and support creation of aquaculture-based farmer associations, clusters, networks, etc.
5. Improve cost effective access to use of information technologies (Internet, mobile phones) to facilitate knowledge transfer, including online training.

Expert panel presentation V.2: Servicing aquaculture sector: role of state and private sector

1. Progress has been made, in servicing the aquaculture sector, but there is a need for equitable access, scaling up to reach large numbers of small rural farmers and getting the right mix of services delivered. There is a need particular to invest in sustainable approaches to delivery of services to the “bottom of the pyramid”
2. There are concerns over reduced public expenditure, but need for more public and private sector investment in aquaculture services.
3. Both state and private sector have roles to play. There is a need to define roles and responsibilities and to ensure coverage, complementarity and impact
4. Sustainability of servicing institutions is an important consideration and there is a need for business models that work for diverse range of services.
5. Whilst private investment in services needs to be mobilized, public investment is also essential – particularly for assisting small-holders.
6. Experience suggests that formation of farmer groups or associations is an entry point for improving the access of small-scale farmers to services. Such local-level farmer’s organizations facilitate access to services, and empower for bargaining and influence on access to services. Successful models need to be shared, networks created and investments made to scale up.
7. Modern ICT tools offer new ways to deliver services to a wide range of stakeholders at scale and should be further pursued.
8. To facilitate investment in improving services, strategic plan(s) should be developed at country/regional level to prioritize needs/gaps and coordinated/complementary approach to service improvements.

Expert panel presentation V.3: Progressing aquaculture in this knowledge economy through virtual technology and decision-making tools for novel management

1. Make virtual technology tools more production- and management-oriented, fully accounting for socio-economic aspects.
2. Adapt such tools to local realities and conditions with respect to ease of use, data requirements, and scientific complexity.
3. Strengthen collaboration between developed and with developing countries, mainly through educational, research, and training programmes, including data quality and data sharing;
4. Reinforce strategic alliances for the implementation of virtual technology in developing countries, ensuring the empowerment of local partners.

Expert panel presentation V.4: Information and data needs: a strategy for improving aquaculture statistics

1. Aquaculture statistics methodologies and standards should consider the need and increasing interest in aquaculture-capture inter-actions. Internationally accepted concepts, definitions and standards should be developed to guide the member states to be able to measure statistically the contribution of aquaculture produced seeds to culture-based-fishery production and wild caught seeds used for aquaculture.
2. FAO should promote among member states the sense of ownership and the concepts that reporting governments are owners of reported data to FAO while FAO only compiles national data globally.
3. FAO should collect feedback from data reporting governments periodically on FAO published data for their own respective countries.

Thematic Session VI - Enhancing the contribution of aquaculture to poverty alleviation, food security and rural development

Expert panel presentation VI.1: Protecting small-scale farmers: a reality within a globalised economy?

1. Specific information related to contribution of aquaculture to poverty alleviation and food security need to be generated to understand the true contribution of aquaculture
2. To empower small-scale farmers and protect them from shocks of globalisation, it is necessary to organize them in to clusters/societies. Appropriate institutions and mechanisms need to be created by governments to sustain and empower the small-scale farmer clusters/clubs.

Expert panel presentation VI.2: Alleviating poverty through aquaculture, how can we improve?

3. Redefine all people within aquaculture value chains, in particular producers, by their vulnerability and their relationship to the activity (move away from terms such as 'small' and 'large' 'farmers')
4. Document impacts and pathways of aquaculture on poverty alleviation at multiple levels (e.g. intra-household, household, community, District/Province/State and National levels), across public and private led initiatives
5. Focus support on adaptive approaches across a broadly defined range of aquaculture initiatives to where it has maximum impact for the most vulnerable and marginalised people in the chain - not necessarily producers
6. Focus support on adaptive approaches across a broadly defined range of aquaculture initiatives to where it has maximum impact for the most vulnerable and marginalised people in the chain - not necessarily producers. Forms of support should either:
 - be based on an expectation that they will cost-effectively *transform* poor livelihoods through sustained improvements in employment and result in measurable improvements in well-being or
 - promote significant *incremental* improvements to livelihoods that will prevent declines into poverty for people currently above locally perceived levels

Expert panel presentation VI.3: Addressing human capital development and gender issues in aquaculture sector

7. Establish an International Centre/University for aquaculture education, supported by FAO.
8. Statistics need to be gender disaggregated. Data collection and documentation to include gender roles and relations throughout the aquaculture value chain and to assess training and educational needs at all levels in aquaculture.
9. Promote the inclusion of social science disciplines (including business administration, sociology, anthropology, geography development studies) in aquaculture curriculum and training to keep up with the broader needs of aquaculture development.
10. Support the formation of platforms/networks of professionals to enhance the sharing of information and experiences, and facilitate harmonization of curriculum and integration of women in the profession.
11. Make assessment of institutional arrangements (e.g. legal framework and entitlements), organizational culture and practices and curriculum from a gender perspective to create enabling working environment for women and men professionals and farmers.

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Expert panel presentation VI.4: Supporting farmer innovations, disseminating indigenous knowledge and aquaculture success stories

13. Document indigenous technology and innovations prevalent in different countries, validate the technologies through scientist-farmer partnership and scale up good practices to bring better benefits to people
14. Promote interaction between the scientific community, students and farmers at field level
15. Promote research, outreach and extension systems in partnership with policy makers, scientists, farmers to address the field problems
16. Invite policy makers to experience field realities with farmer innovators
17. Increase the role of farmers in research planning and implementation
18. Promote farmer to farmer exchange in all possible contexts and opportunities
19. Place emphasis on capacity building skills with knowledge of extension staff
20. Disseminate documented examples of indigenous knowledge and innovations through new technologies and institutions particularly through regional networks and their websites
21. Recognize innovations/innovators on occasions such as World Food Day
22. Promote farmer to farmer exchange in all possible contexts and opportunities