

**Minutes of the workshops on aquaculture held
within the framework of the World Conservation Forum
(Bangkok, 17 – 25 November 2005)**

Aquaculture is an old human activity; however its development was particularly significant during the last decades in terms of production volumes, sources of income and use of land and sea surface areas. Indeed, having great hopes of using aquaculture as a tool for mitigating their deficit in animal proteins, many countries implemented incentive policies to promote aquaculture practices. The world aquaculture production is nowadays estimated at about 55 million metric tons per year (corresponding to a value of about 67 billion US\$) while it was around 2 million tons in the beginning of the sixties.

Considering that aquaculture still has great growing potential and is however facing crucial sustainability challenges, the organising committee of the World Conservation Congress (Bangkok 17 – 25 November 2004) accepted the offer made by the IUCN Centre in Malaga, the FAO and the FEAP to organise two workshops on:

- Aquaculture and environment: Bringing together new partners to progress toward sustainability in aquaculture
- Criteria and Indicators for sustainability in aquaculture

These two workshops were held back-to-back within one session during the afternoon of Friday 19th of November 2004 respectively from 14.00 to 16.30 and from 17.00 to 19.30. The first one was a Global Synthesis Workshop, the second a Sponsored Workshop.

François SIMARD, Programme Officer at the IUCN's Centre in Malaga opened the session by introducing the objectives of the two workshops and the proposed organisation of work. He emphasised in particular that these two workshops are expected to be the start for the IUCN Family (Members, Secretariat, Centres and partner organisations) of a programme of activity dedicated at promoting more harmony between aquaculture and the environment preservation.

Workshop 1: Aquaculture and environment: Bringing together new partners to progress toward sustainability in aquaculture

Theme: What are the environmental impacts of aquaculture?

Chairman: Chedly RAIS (IUCN-Med)

Panellists:

Simon Funge-Smith (FAO Regional Office Asia and the Pacific)

Katherine Bostick (WWF-USA)

Dean Yont Musig (Kasetsart University, Bangkok)

Theme 2: Can aquaculture take the pressure off high seas fisheries?

Chairman: Denis Lacroix (IFREMER, France)

Panellist:

Pedro Bueno, (Network of Aquaculture Centers of Asia-Pacific -NACA)

Abdelhafid Chalabi (IUCN-Med)

Theme 3: What positive contributions can aquaculture provide to livelihoods?

Chairman: Michael Phillips (Network of Aquaculture Centers of Asia-Pacific, NACA)

Panellists:

Ron Zweig (World Bank)

Rationale:

The environmental issues emerged from the development of intensive aquaculture, including occupation of the coastal zone, combined with questions concerning quality and potential contaminants, etc., are complicated and raise concerns as to the sustainability of this sector. Furthermore, the displacement of local livelihoods, the harvesting of animals from localized ecosystems, the gender issue as well as food safety and human health must also be considered. Such issues are important in developing and developed countries.

The main objective of this workshop was to bring together representatives of the aquaculture sector (institutional as well as private), specialists on conservation, scientists and representatives of local communities involved in aquaculture, for the renewal of dialogue on aquaculture and environment with the view of giving further consideration to the aquaculture sustainability issue and devising collaborative projects such as the development of codes of conduct and practice within the private sector.

Main elements of the workshop debates:

The presentations given by the panellists during this workshop were oriented towards introducing the debate concerning the following questions:

- Is aquaculture an activity that causes negative impacts on natural resources?
- Is aquaculture a polluting activity?
- Is aquaculture worse or better than other food-producing or economic activities in the coastal zone?
- Is aquaculture an activity that may replace fisheries in providing seafood products?
- What is sustainability in aquaculture?
- Does aquaculture make positive contribution to the environment and rural livelihoods?

The participants stressed that the aquaculture could have a significant negative impact on the environment, the main issues highlighted were:

- Habitat degradation
- Decrease in water and sediment quality
- Decline of the wild fish populations because the taking of fish seeds for aquaculture
- Risks of introducing invasive species

The following principles were presented and discussed:

Principle 1: Locate aquaculture farms in suitable areas for farming that do not impact on habitats

Possible criteria:

- Location and operation of farms that does not impact on ecologically sensitive habitats or impair ecosystem functions
- Aquaculture farms located in sites identified/declared suitable for aquaculture farming

Principle 2: Reduce impacts on water resources and sediment

Possible criteria:

- Farming within capacity of environment
- Treatment of aquaculture wastes

Principle 3: Responsible use of seed resources and farming practices that minimize impacts on wild populations and aquatic biodiversity

Possible criteria

- Do not impact wild populations through collection of aquatic animals for farming
- Use of quality hatchery reared aquaculture seed (fishes, shrimps, molluscs)
- Maintained genetic diversity of aquaculture species
- Low impacts of escapes
- Responsible movement of aquatic animals (wise exotic species introduction)

Principle 4: make an efficient use of feed resources and reduce reliance on marine feed resources for aquaculture

Possible criteria:

- Feed formulation and production that uses resources efficiently
- Feeding practices that make efficient use of aquaculture feed
- Reduced reliance on marine resources for aquaculture diets

Principle 5: Reduce risks of aquatic animal diseases impacting farmed and wild stocks

Possible criteria:

- Aquatic animal health management that reduce stress and prevent diseases
- Responsible trans-boundary movement of live aquatic animals
- Measures to control spread of disease to wild populations

Principle 6: Reduce chemical use and assure food safety of aquaculture products

Possible criteria:

- Reduced use of chemicals through preventative health management
- Use of only approved chemicals
- Adherence to GAP protocols/quality assurance schemes

Principle 7: Enhance social and community benefits from aquaculture

Possible criteria:

- Operations to minimize impacts on surrounding resource users
- Ensuring benefits to local people from aquaculture operations (in developing countries)
- Maximizing the potential for aquaculture to contribute to poverty alleviation

Principle 8: Build capacity among stakeholders for sustainable aquaculture farming

Possible criteria:

- Training and education programs
- Promotion of partnerships among stakeholders to develop and implement sustainable aquaculture farming practices
- Promotion of the organization of farmers

Here are the main conclusions of the workshop:

- As all human activities, aquaculture has impacts on the environment. Aquaculture is impacting environment at the local level, on resources, on biodiversity, and also local

communities and their livelihoods. These impacts must be reduced at all levels. A number of good practices show that it is possible in many cases to reduce them.

- Often, some good management measures (breeding density, feed quality) and a good site selection (depth, currents, and other activities) allow solving a number of environmental problems and at the same time to get a better productivity and a better product quality.
- The proposed principles should be given further consideration within the framework of an initiative involving the relevant organizations.
- Aquaculture can bring money and jobs to the local community, but if the activity is badly managed, also undermine local livelihoods by destroying the ecosystem on which these livelihoods are based.
- The idea that aquaculture is the future for production of food from the sea is wrong. The balance between fisheries and aquaculture is dynamic and shifting towards aquaculture, but fisheries should become a sustainable activity and aquaculture should be developed in a sustainable manner.

Workshop 2: Criteria and Indicators for sustainability in aquaculture

Chairperson: Simon Funge Smith,

Facilitator: Chedly Rais

Panellists: Denis Lacroix, Michael Phillips, Pedro Bueno, Abdelhafid Chalabi, Jurgenne Primavera, Ron Zweig, Katherine Bostick, Surachet Chettamart (Department of Fisheries, Thailand)

Rationale:

The main objective of the workshop was to bring together representatives of the aquaculture sector, conservation specialists and scientists to further investigate the feasibility of identifying and defining biological, ecological, and socio-economic indicators for aquaculture sustainability.

Main elements of the workshop debates:

The first part of the workshop was dedicated to assess whether Aquaculture, as it is practised nowadays, is in line with the basic principles of sustainability. The following main questions were analysed:

- Could both Fisheries and aquaculture be sustainable?
- Does aquaculture help towards the equitable sharing of benefits that result from the use of natural resources (especially for local population and communities) ?
- Are aquaculture practices likely to compromise the right of future generations to resource use?
- Is the "polluter pays" principle being applied in aquaculture?
- Is aquaculture an economically viable activity when the cost of the aquaculture product is calculated taking into account the cost of the degradation caused to the environment?
- Is the precautionary principle sufficiently applied in aquaculture?

Following the debates on these questions and considering the environmental impacts of aquaculture as discussed during the Workshop 1, the participants discussed several possible indicators for assessing aquaculture sustainability. The main proposed indicators were:

Possible Institutional Indicators

- Governmental aid for aquaculture
- Integration of aquaculture in rural development

- Involvement of stakeholders
- Dependence on external know-how
- Development of culture based fisheries

Possible Environmental/Ecological Indicators

- Diversity of species
- Diversity of techniques
- Dependence on the wild stocks
- Development of culture based fisheries
- Waste generation (Nitrogen, phosphorus and suspended matter in effluents)
- Water quality
- Use of Chemical
- Energy use
- Food Conversion Rate
- Land/Habitat use
- Alien species introduction including Genetic Changes in populations

Possible Economical Indicators

- Total contribution to food supply
- Integration of aquaculture in rural development
- Diversity of species
- Diversity of techniques
- Dependence on the wild stocks
- Economic performance
- Foreign currency balance

Possible Social Indicators

- Employment
- Income level
- Equity

During the debates the participants stressed that indicators allow monitoring progress towards sustainability of aquaculture and help Decision-makers in assessing the efficiency of the adopted policies. It was also emphasised that the process of identifying and calculating indicators provides an opportunity for further consultation and involvement of stakeholders. They agreed to pursue the exchange on the subject with the view of elaborating a set of indicators for assessing the sustainability of aquaculture. The set of indicators should take into account the diversity of aquaculture techniques and of the contexts in which they are used.