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REGIONAL PRINCIPLES FOR RESPONSIBLE AQUACULTURE IN CENTRAL ASIA

INTRODUCTION

1. This document provides background information on regional guidelines on the code of Good Management Practices (GMPs) for Central Asian Aquaculture. These guidelines intend to set principles for Responsible Aquaculture applicable to Central Asian region to provide with basis of development of more locally applicable and site specific Codes of GMPs or other management approaches for aquaculture, suitable for adoption by producer in particular social, environmental and economic contexts. It is further expected that the principles will provide public and private sectors with the basis of developing planning and operational management of responsible aquaculture in Central Asian countries. The principles and implementation guidance consider technical, environmental, social and economic issues associated with the aquaculture practices and provide a basis for industry and government management to improve the overall aquaculture practices at national and regional levels. Because of existence of varying type of aquaculture operations and management regimes within the Central Asian it should be noted that "one size fits all" approach is not appropriate for entire region in terms of BMPs. Aquaculture generally is a site-specific practice therefore local site and environment conditions need to be properly taken into account during the development and implementation of BMPs.

2. A regional workshop on the development of the Code of Good Management Practices (GMPs) for Central Asian Aquaculture workshop was held in Bishkek, Kyrgyzstan, 8 - 9 May 2012 with joint cooperation of the Central Asia Regional Programme for Fisheries and Aquaculture Development (FishDev Central Asia) and Support to Fishery and Aquaculture Managements in the Kyrgyz Republic (GCP/KYR/003/FIN) project. The regional workshop underlined importance of development of regional GMPs for Central Asian aquaculture. The workshop also identified the main components of the proposed regional GMPs.

3. Aquaculture is witnessing a rapid technological development in production technologies which may differ by the aquaculture species and by the production systems for varying species. Aquaculture production and trade of aquaculture products continue to grow at a fast pace, responding to increased global demand for fish, shrimp, mollusks and other aquatic products. With increasing volume of production, trade and consumption there is concurrent and increasing demand for sustainability by good management practices, social acceptability and human health safety from the aquaculture sector. One of the reasons for this demand is aquaculture usually has not been considered in national planning related to resource use such as soil and water conservation, water pollution, plant and animal

quarantine programs, and other aspects of environmental management. However, countries must consider to prevent the potential to cause adverse impacts as aquaculture has become or identified as a potential major food producing sector for food security and enhancement of livelihoods and income, particularly for rural poor. Public and scientific opinion is demanding better environmental stewardship, and wiser use of dwindling world resources.

4. There are several reasons why better aquaculture management practices and production methods should be improved through integrated management practices. Main driven forces for implementation of BMPs, among other things, include:(I) compliance with international, regional and national legislation and regulations (II) Increased consumer awareness (III) increased environmental concerns (IV) A need to regulate the rapidly growing aquaculture sector (V) Increasing competition for aquatic and land resources. One of guiding principles of BMPs that producer should be responsible to the environment, the fish, the consumer and the other resource users. BMPs should address specific concerns, including environmental sustainability and product quality and safety and identify operational standards.

5. Aquaculture BMPs aims to provide effective and efficient management of environmental and economic sustainability and aquaculture production. There are many examples of environmental mismanagement that resulted in unsustainability and failed investments. BMPs are a series of considerations, procedures, protocols, practice tools or measures designed to help management of foster efficient and responsible aquaculture production and expansion and to help ensure final product quality, safety, and environmental sustainability. Key components of an aquaculture BMP are facility siting, design of farm and production systems; safety and biosecurity; feed management, waste management, storage; production techniques, fish health and welfare, product quality and safety, recording and reporting, and monitoring.

6. There are many examples of BMPs that have been prepared for aquaculture sector. These BMPs can be specific for address the entire sector, sub-sector or species. They should be developed based on available best science and technology and be regularly updated taking into consideration the technological, technical developments. The management and conservation compliance framework drawn by FAO's Code of Conduct for Responsible Fisheries (CCRF), an international non-binding fisheries instrument, provides a valuable guidance that can be used in the development of BMPs. Despite the presence of available BMPs for capture fisheries and aquaculture, BMPs have not been duly translated into respective fisheries and aquaculture practices in the Central Asian and Caucasus regions due to the well-known technical, administrative, and financial restrictions. Absence of awareness on BMPs and lack of sound environmental standards. on the other way, might be the other contributing factors. As far as aquaculture is concerned, the sector would gradually operate in line with the principles of CCRF by launching the participatory implementation of BMPs. An effective approach to voluntary regulation of an industry is for its members to adopt codes of practices that contain Good Management Practices (GMPs) designed to ensure a sustainable aquaculture industry which is socially and environmentally responsible. The systems of GMPs will have to be customized, among others, for site characteristics, production goals, and be integrated with national sectoral policies/strategies and interests. The most practical procedure appears to be for an industry group to develop a general code of practice for a region or a nation, and this code of practice can be satisfied through application of site-specific GMPs.

7. The BMPs are generally non-binding management instruments that set down suggested operational principles and standards for better and more sustainable aquaculture practices. Therefore, ways of practice is left to the farmers. An experienced aquaculture farmer is expected to put into practice the better aquaculture management practices and production methods by incorporation of a BMP or a combination of BMPs. The BMPs should be flexible and offer alternative practices for farmer, ensuring that they are carried out in compliance with the respective policies, legislation, regulations, and rules. The BMPs also known as producers' or industry associations' guidance tools in countries that lack regulations or the ability to monitor and enforce environmental and social standards.

8. There is an emerging need to encourage the use of BMPs in Central Asian and Caucasus regions. Although the regional guidelines have been prepared for Central Asian aquaculture they can be applied to the aquaculture of Caucasus region. For stakeholders the principles and implementation guidance provide the basis upon which they can collaborate for a more sustainable development of aquaculture. For governments, they provide the basis for policy, administration and legal frameworks that can be renewed, adjusted, funded and implemented to address the specific characteristics and needs of the sector in order to protect and enhance the industry, the environment, other resource users and consumers. In most of Central Asian countries the existing legislation and guidelines have been modified from those suitable for other industries and are not always applicable to aquaculture. Strengthening of institutional arrangements, capacity and partnerships is also important to ensure the cooperation and coordination of all relevant institutions with jurisdiction over natural resources, animal and public health. The principles and guidance in the code will also provide the basis for development of standards and certification systems in aquaculture.

9. In Central Asia and Caucasus region TAC would have a role in development of a scientific/technical general BMPs framework for Central Asian aquaculture which can be applied in CACFish competence area, taking into regional needs and future challenges. Setting of scientific/technical minimum requirements, thresholds, minimum standards for project-specific and development activity EIA would be primary feedbacks that TAC may provide in this regard. TAC may also generate such scientific/technical guiding advice for fisheries. With regard to such advice, TAC would also identify required actions and mechanism for tackling the difficulties faced by the region.

SUGGESTED ACTION FOR TAC

10.TAC is invited to examine the regional guidelines on code of good management practices for Central Asian aquaculture and generate related technical/scientific advice for consideration of CACFish.

Annex:

Regional Principles for Responsible Aquaculture in Central Asia

(Compiled by Sunil N. Siriwardena and Haydar Fersoy)

Regional Principles for Responsible Aquaculture in Central Asia

Introduction

At these levels of production, trade and consumption there is a concurrent increasing demand for improvements in sustainability, social acceptability and human health safety. One of the reasons for failure of aquaculture to develop fully in these areas is aquaculture usually has not been considered in national planning, related to resource use in the same way soil and water conservation, water pollution, plant and animal quarantine programs and other aspects of environmental management have been (Boyd *et al* 2008). However, countries must work to prevent the potential to cause adverse impacts from aquaculture. It is particularly important as aquaculture has become or is identified as a potential major food producing sector for food security and for enhancement of livelihoods and income, particularly for the rural poor. Public and scientific opinion is demanding better environmental stewardship and wiser use of dwindling world resources. There are several reasons why aquaculture practices and methods should be improved (after Boyd *et al* 2008);

- Consumers are concerned with food safety and want food produced by environmentally and socially responsible methods.
- Environmental groups seek to relieve pressure on natural fisheries through responsible aquaculture.
- Developed nations are depending more on imported food and want to assure that good production practices are used in exporting nations.
- The aquaculture industry wants to assure its markets.
- Governments want to protect the environment and to promote exports.

Commonly agreed management frameworks for aquaculture include, *inter alia* and in no particular order, the following key components;

- Compliance with respective legislation/regulations
- Environmentally responsible sustainable development
- Long-term protection of the environment
- Economic viability
- Respect to other resource users
- Water quality management
- Human health
- Animal health and welfare
- Fish escapement
- Accountability and shared responsibility and
- Stakeholder participation and communication.

Regional Principles for Responsible Aquaculture in Central Asia

This section contains 8 regional principles for the development of sustainable and responsible aquaculture for Central Asia.

Principle 1 – Aquaculture Farm Siting

Individuals, groups of persons and companies involved in aquaculture and related operations, exclusively and collectively, shall site their aquaculture structures and facilities according to respective national legislation and planning and only in environmentally compatible locations, while ensuring efficient water, energy and land use; reducing or mitigating possible negative impacts on biodiversity and water quality and respecting the rights of other users of land and water.

Justification:

Siting aquaculture structures and production in locations compatible with the environment minimizes or prevents negative impacts on ecology. In doing so it helps to conserve biodiversity of the area, ensuring aquaculture development abides by existing laws and regulations. The rational use of land and water resources and respecting the rights of other users will reduce the cost of aquaculture practices, prevent possible conflicts with other natural resource users and reduce social injustice. Moreover, conducting site suitability assessment for aquaculture sites before investment of time, money and resources in designing the aquaculture project is of high importance for the long-term sustainability of aquaculture operations.

Implementation guidance:

- Conduct, when appropriate, an environmental site assessment as part of an Environmental Impact Assessment (EIA) process or project application process
- Avoid sites which are access routes or part of access routes for fishing grounds or that obstruct other resource users.
- Retain buffer zones and habitat corridors between farms and between important habitats and other users.
- Do not use buffer zones to site aquaculture farms.
- Avoid productive agricultural land to site aquaculture farms.
- Develop criteria for site selection and for assessment of carrying capacity
- Take into consideration the local environmental conditions and estimated carrying capacity of aquaculture in the area.
- Avoid sites that are reaching or have already reached its carrying capacity for aquaculture.
- Locate aquaculture farms in locations with suitable soil quality and with access to a water source with suitable water quality.
- Select sites that decrease the possibility of disease outbreaks.
- Obey national and local legislation and planning requirements of natural resource use such as land and water.
- Site coastal aquaculture farms in the supra-tidal zone. This zone may include inter-tidal areas where water reaches only at High High-Water Level.

- Avoid ecologically sensitive habitats such as mangroves, salt marshes and mudflats to site coastal aquaculture practices.

Principle 2 – Aquaculture Farm design

Design and construct aquaculture farms in a manner to ensure safe and optimal aquaculture operations that minimizes disturbance to the surrounding ecosystem and environmental damage.

Justification:

Poorly designed aquaculture farms increase maintenance costs, add to erosion, negatively impact management decisions, decrease farm profitability, cause self-pollution and increase flood hazards. Improper designs can cause negative impacts on the environment due to, among others, effluent discharge and sedimentation. Aquaculture farms should be designed to ensure implementation of good management practices and integrate the farm into the local environment whilst minimising possible environmental damage and ensuring safe, efficient and cost-effective operations.

Implementation guidance:

- Design and construct aquaculture farms and other facilities without obstructing natural waterways and flood retention and/or detention areas, and without adversely affecting the local hydrology.
- Design and construct aquaculture farms using appropriate engineering techniques to minimize soil erosion and salination of the surrounding environment.
- Maintain sufficient buffer zones between farms, and the farm and water sources, roads railways and ecologically sensitive habitats.
- Locate inlets and outlets of an individual farm and those of and between adjacent farms at a suitable distance to prevent self-pollution.
- Conserve local biodiversity and compensate any loss of important habitat by re-establishing same.
- Design production units and systems in such a way to ensure that the sites allow optimal culture of the target fish species
- Design production culture systems to minimize possible adverse environmental impacts.
- Design the production systems to use water resources economically and responsibly.
- Design the farm in such a way to protect the cultured fish from predation.
- Design production systems to prevent escape of fish from the culture units, which may negatively impact natural fish stocks and habitats.

Principle 3 – Water use

Use water in a responsible manner to minimise the impact of water use on overall water resources and the environment, and to avoid user conflicts.

Justification:

Minimizing water use in aquaculture, particularly freshwater resources, is an important issue. Water is a resource that is in competitive use among domestic and other resource users. Excessive extraction of groundwater for aquaculture may cause conflicts with other water users and may result in land

subsidence. Responsible water use is not only limited to obtaining water from a suitable water source, but also responsible discharging of effluent water. Water released from ponds, particularly from semi-intensive and intensive systems that are partially or completely drained, has high concentrations of nutrients, organic matter and suspended solids. Releasing or draining pond water to receiving waters may have negative impacts, such as eutrophication and sedimentation, due to high nutrient concentrations and suspended solids. Thus, particular attention should be given to techniques for enhancing the quality of pond draining effluent and especially the final effluent from ponds when drained completely.

Implementation guidance:

- Do not use groundwater without calculating the allowable extraction amount and do not use excessive or exceed groundwater resources.
- Obey national and local laws and regulations on water use and effluent discharge.
- Ensure discharge water meets agreed water quality standards.
- Actively manage aquaculture effluent to prevent or minimize environmental impacts to receiving waters.
- Minimize/optimize use of water through re-use or recirculating aquaculture systems, where possible.
- Utilize waste management technologies applicable to the culture systems.
- Do not discharge aquaculture effluents into sensitive ecological habitats.
- Maintain and improve the pond environment with optimal water quality.

Principle 4 – Feed Management

Use nutritionally balanced feed by making efficient use of locally available feed resources, where possible, and employing efficient feeding management practices that ensure optimal growth of target species and minimizes feed waste.

Justification:

Feed constitutes the major operational cost component of many semi-intensive and intensive aquaculture practices. Improper feed management practices facilitates accumulation of uneaten feed in the aquaculture systems leading to sub-optimal water quality and high nutrient levels in discharge water which may cause eutrophication in receiving water. Sub-optimal culture environments stress the target species, slowing the growth and making them susceptible to disease leading to economic loses. Good feed management minimizes nutrient inputs into pond water and is an important aspect of water quality and fish health management.

Implementation guidance:

- Use high quality feed that meets the nutritional requirements of the fish species being cultured, ideally from local sources.
- Store feed in a proper manner and under proper conditions to prevent contamination, and excessive wastage.
- Practice efficient and effective feed practices to optimise growth and minimize feed waste.

- Observe the feeding responses of the cultured fish and adapt the feeding regime accordingly to optimize performance.
- Do not use fish as feed as this adversely impacts the livelihoods and compromises food security of poor and vulnerable groups, especially those directly dependent upon the resource.

Principle 5 – Health management

Adopt health management strategies and bio-security measures that prevent or minimize disease incidences in cultured and wild stocks and that act to reduce the risks of disease occurrence and transmission.

Justification:

All measures should be taken to prevent disease incidents in aquaculture stocks as disease can cause production and economic loses and impact wild stocks. Use of disease free and healthy fish for stocking, maintenance of optimal culture environment and adoption of bio-security measures are key to reduce risk factors of disease and prevent disease incidents in cultured stocks. Good husbandry practices are critical for aquatic animal health management and to prevent transmission of diseases within the farm and between farms. Maintaining proper environmental conditions, selecting healthy fish, providing a well-balanced nutritious diet, minimizing stress and providing good fish welfare, routine observation and monitoring, diagnosing disease when it occurs and good record keeping, and controlling and treating disease outbreaks all are important aspects of good husbandry and health management plans.

Implementation guidance:

- Adopt disease risk reduction and prevention strategies to prevent and minimize transmission of diseases within the farm and between farms.
- Implement good animal husbandry and management practices for fish health and welfare.
- Use veterinary drugs responsibly with advice from fish health professionals.
- Avoid where possible or minimize use of antibiotics and medicated feeds, and only use on the advice of qualified veterinary professionals.
- Follow proper transportation, quarantine and acclimation practices.
- Minimize stress on fish by avoiding sudden environmental changes and maintaining good handling practices.
- Routinely observe behaviour of fish for signs of disease and stress.
- Maintain and update fish health records.

Principle 6 – Broodstock and fish seed supply

Develop through selection and use high quality healthy broodstock to produce good quality fish seed where such will ensure bio-security, reduce disease incidence and optimize production and reduce fishing pressure on wild stocks.

Justification:

Collection of broodstock and fish seed (eggs and fry) from the wild stocks for use in aquaculture has often been implicated in contributing to the endangerment of aquatic biodiversity. Development and management of domesticated broodstock and improved captive breeding technologies contribute to

the supply of good quality fish seed which are more adapted to a culture environment. These fish grow faster, use food more efficiently and produce less waste contributing to improve effluent water quality. Broodstock management and genetic improvement programmes will help improve production and profitability, as well as assist in the protection and conservation of wild resources. Adhering to agreed regional or international guidelines including risk assessment and precautionary approaches in translocation and movement of fish will help ensure wise decisions that will protect society and the environment, while at the same time allowing the sector to develop.

Implementation guidance:

Avoid negative impacts on biodiversity from collection of broodstock and wild fish seed (eggs and fry).

- Select as far as possible local and indigenous species for aquaculture.
- Maintain and use domesticated quality broodstock and captive breeding techniques to produce and supply fish seeds.
- Adopt on-farm quarantine and bio-security measures to prevent or reduce the risk of disease introductions.
- Adopt quality assurance measures for fish seed supply.
- Develop technology that allows broodstock development from domesticated stocks.
- If moving broodstock and fish seed across boundaries within or between countries comply with national, regional and international criteria on trans-boundary movement of aquatic animals.
- Use certified disease-free fish seed.

Principle 7 - Food safety

Ensure food safety and human health by adopting responsible use of materials, chemicals and veterinary drugs, and microbial sanitation in the handling, harvesting, post-harvesting and marketing of fish and fishery products.

Justification:

Products from aquaculture have sometimes been associated with certain food safety issues, as the risk of contamination of products by chemical and biological agents is greater in freshwater and coastal ecosystems than in the open sea. Food-borne parasitic infections, food-borne disease associated with pathogenic bacteria, residues of agro-chemicals, veterinary drugs and heavy metal contamination have all been identified as potential hazards of aquaculture products. Food safety concerns may arise from inappropriate aquaculture practices, environmental pollution and human habits of food preparation and consumption. Thus, with the increasing contribution of aquaculture to food supplies and to regional and international trade, proper assessment and regulation of any food safety concerns are becoming increasingly important.

Implementation guidance:

- Do not use banned antibiotics, drugs and chemicals or hormones as growth promoters.
- Use authorised antibiotics when only prescribed by a veterinarian/fish health specialist.
- If needed, then use vaccines and anaesthetics according to manufacturer's instructions.
- Prevent contamination with human waste and untreated animal manure.

- Apply quality control measures to produce safe high quality aquaculture products, including staff training.
- Establish product traceability by keeping and maintaining proper record keeping of data and information.
- Ensure good sanitary conditions for harvest, handling and transport of aquaculture produce.
- Encourage production, harvesting and marketing of high quality fish and fish products that comply with the respective internationally recognized standards.

Principle 8 – Social responsibility

Develop and operate farms utilizing technologies, equipment and practices that ensure the safety of employees and do so in a socially responsible manner that accrue mutual benefits to both the farm and the communities living around.

Justification:

With increasing aquaculture production for products that are traded for consumption there is an increasing demand for sustainability, social acceptability and human health safety from the aquaculture sector. It is also expected that aquaculture practices being implemented respect property rights and regulatory compliance, observing good community and employee relations and ensuring worker safety, in order that aquaculture can be a socially responsible and respectable economic activity.

Implementation guidance:

- Farms should comply with local and national laws and seek legal rights to use the land and water resources.
- Farms should comply with local and national labour laws to assure adequate worker health and safety and provide appropriate facilities and financial compensation.
- Train employees adequately on safety, farm operations and first aid and equip them with necessary protective equipment.
- Make arrangement to seek prompt medical attention, when required.
- Avoid conflicts and maintain good relations with the community to ensure mutual benefits are accrued to both the farm and the community.

References

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