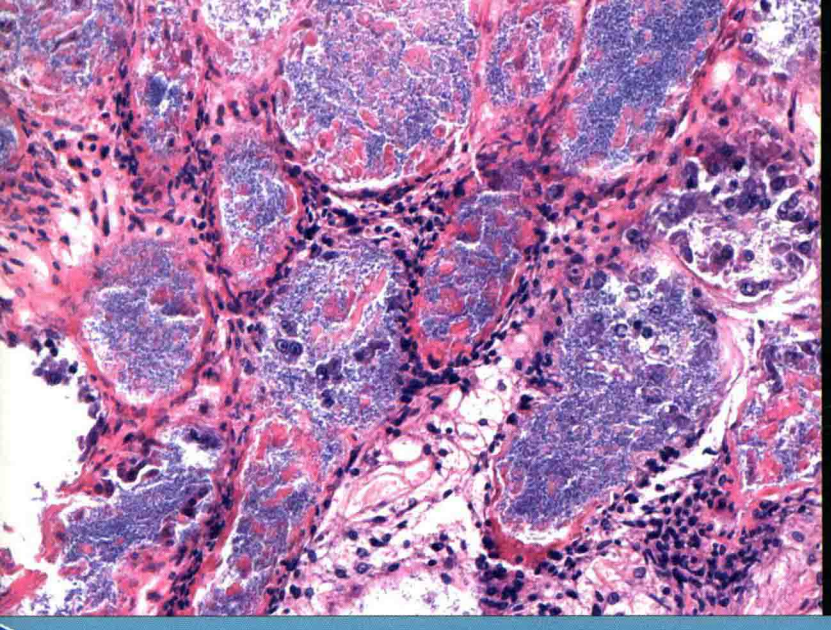
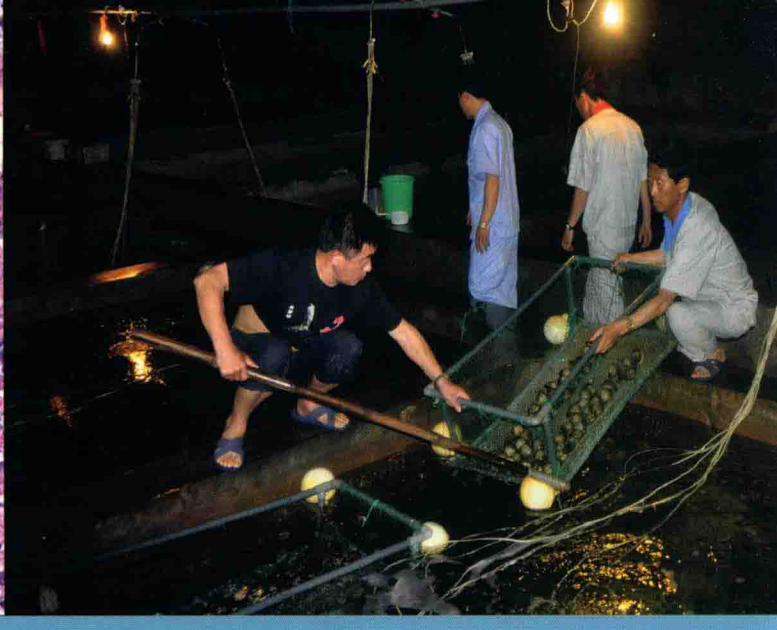




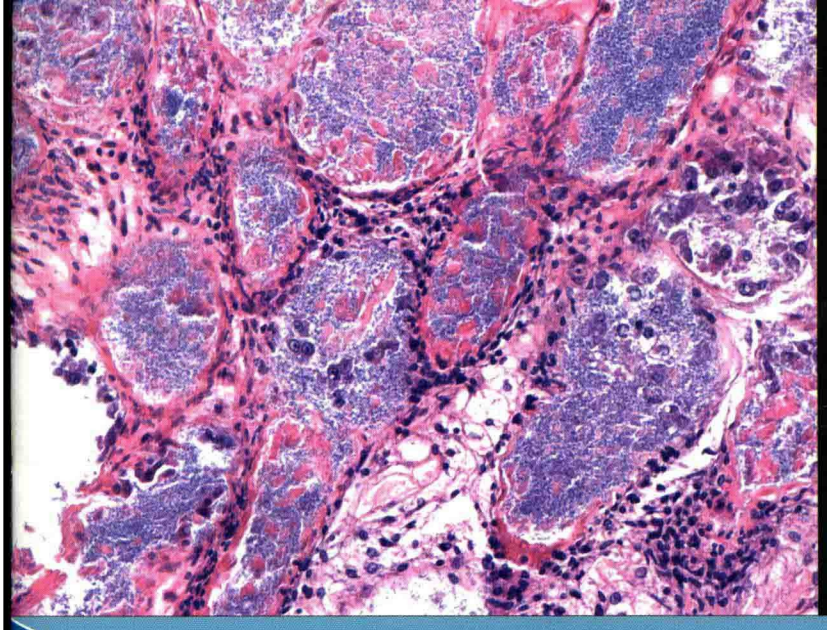
Early mortality syndrome of shrimp

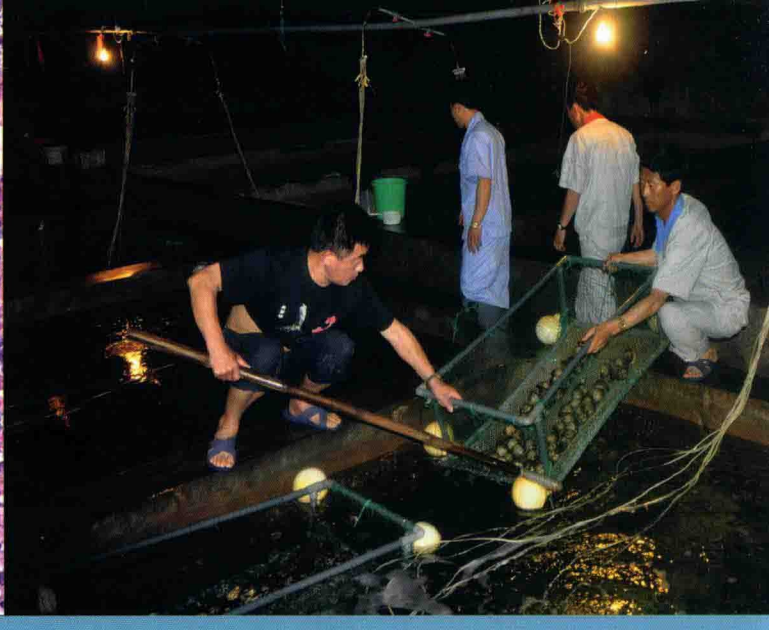
FAN

51 June 2013

Seventh Session of COFI/SCA

FAO Aquaculture Newsletter





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Fish IN Nutrition or Fish AND Nutrition?

A relatively young food production sector when compared to other sectors (e.g. terrestrial, crops), aquaculture development during the last few decades had been remarkable. While past development efforts mainly focused on production technologies and environmental issues, little attention was given to the value of aquaculture to human nutrition, even in major conferences on aquaculture.

Dr Albert Tacon, former FAO staff and fish nutrition expert, pointed to "food fish" not only as an excellent source of high quality animal protein and, equally important, as an extremely rich source of omega-3 polyunsaturated fatty acids, i.e. EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) with health benefits both for the body and the mind.

A world renowned brain chemistry and human nutrition expert, Dr Michael A. Crawford, during a plenary talk at the 5th World Fisheries Congress 2008 held in Yokohama, Japan, said that solving the problem of mental ill health (predicted by the Global Forum of Health, www.globalforumhealth.org, to be the top three burdens of ill health world wide by 2020), "...will require a new paradigm in food with a focus on the nutritional requirements for the brain. This may well mean agriculturising the oceans and enhancing the development, use and consumption of sea food worldwide". According to Dr Crawford, it is essential that DHA is obtained for human nutrition especially during pregnancy and lactation when the new fetal and infant's brain is forming at high velocity. He reckoned that while the land food chain is a poor source of DHA, the richest source is the marine food web where the brain first evolved.

The significant role that aquaculture (and fisheries) could play in improving human nutrition will be discussed in two major upcoming events: the first one will be during the Seventh Session of the COFI Sub-Committee on Aquaculture (St Petersburg, October 2013); and secondly, during the Joint FAO/WHO International Conference on Nutrition (ICN2) in 2014.

The above initiatives are much awaited considering the increasing recognition that fish has superior nutrition qualities which can be beneficial for early life development (first 1000 days), for pregnant and lactating mothers. Eating fish is part of the cultural tradition of many people. About 1 billion people in 58 countries worldwide including many developing and low-income food-deficit countries depend on food fish as the primary source of animal protein. In some countries, fish is a major source of food and essential nutrients. There is clear evidence that eating fish can address health problems such as stunting and obesity; thus, a good alternative to less healthy diets.

There are also essential micronutrients found in significant amounts only in some freshwater fish species, particularly certain indigenous fish. The specific nutrients provided by these fish can be found from cultural and traditional knowledge, especially, of rural communities in developing countries. However, these indigenous species are slowly diminishing in many parts of the world, mainly due to the rather unplanned and unregulated human development activities. A shift in development objectives, that reduce such negative impacts, is important in order to harness the contribution of these aquatic species to the nutrition of many poor and vulnerable communities around the world. More attention should be given to promoting aquatic biodiversity conservation and active engagement in promoting, e.g. rice-fish farming in rural development programmes, where possible. Aquaculture stakeholders working together with a firm recognition of the role of fish in human nutrition will enable the sector to provide affordable, accessible and nutritious "food fish" to support the expected 9.2 billion people by 2050. To achieve this, it should be **Fish IN Nutrition rather than Fish AND Nutrition.**

Photos cover:
Top left: Histopathology of Early Mortality Syndrome, courtesy of Loc Tran
Top right: Trainees working in the ark shell hatchery in Qingdao, China, courtesy of G. Chunren
Bottom: Whiteleg shrimp *(Litopenaeus vannamei)* under a pond side health check, Surat Thani Province, Thailand, courtesy of K. Yamamoto

CONTENTS

7th Session of the COFI Sub-Committee on Aquaculture

St Petersburg, Russia, 7-11 October 2013

The 7th Session of the Committee on Fisheries COFI Sub-Committee on Aquaculture (COFI/SCA7) will be held at the Redisson Pribaltiyskaya Hotel, St. Petersburg, Russia from 7-11 October 2013. The Session is sponsored and hosted by the Russian Federation.

Since its establishment in 2001, the SCA has convened six sessions in P.R. China, Norway, India, Chile, Thailand and South Africa. The 7th Session will take place in an era where hunger and malnutrition continues to be the most devastating problems worldwide. They are inextricably linked with poverty and currently almost 870 million people are chronically undernourished. The challenges governments and international development communities need to address, given a global population that is projected to reach 9 billion in 2050, much of it in developing countries prone to hunger, is to ensure adequate food and nutritional security for all.

It is widely acknowledged that aquaculture has the capacity – if supported and developed in a regulated, environmentally, socially responsible and sensitive manner – to address the challenges and contribute positively towards eradication of hunger, food insecurity and malnutrition. However, the challenges of reducing poverty and the magnitude and diversity of the aquaculture sector issues around the world are simply too big for any single government or organization to tackle alone. Addressing the challenges thus requires making use of the world's best knowledge and capacities, and financial resources, which do not reside in any one institution. The international development community therefore attaches great importance to working together in partnership with all relevant governmental, non -governmental, private sector and other stakeholders at global, regional and national levels in support of shared development goals.

The 7th Session of COFI/SCA will address many issues relevant to the above goals and inspirations, both at policy and technical levels. Among others, the following are some of the interesting and relevant topics to be discussed in St. Petersburg.

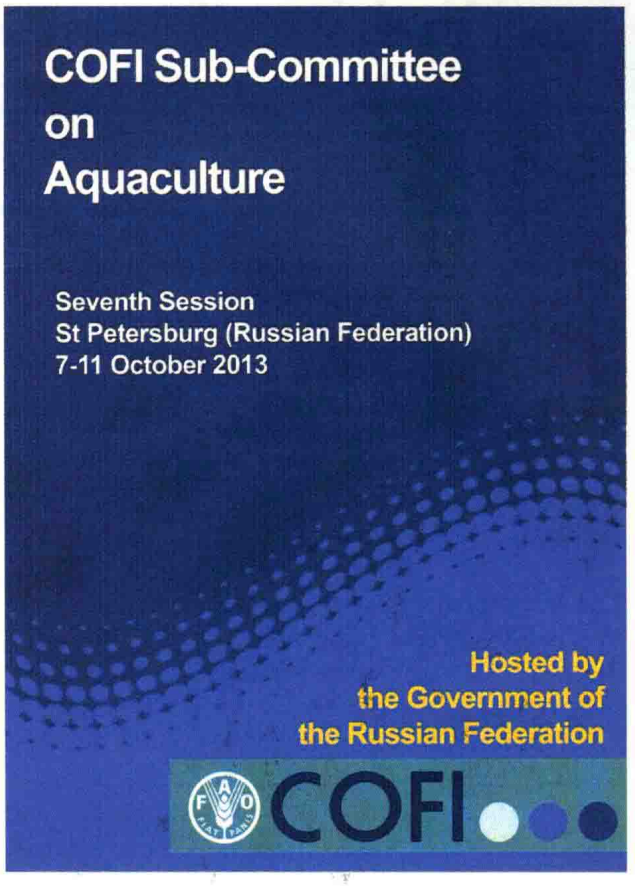
Evaluation framework to assess to conformity of aquaculture certification schemes with the FAO aquaculture certification guidelines: Driven by concerns that some forms of aquaculture are environmentally unsustainable, socially inequitable and that products are not safe for consumers, there have been attempts, over the years, to respond to the consequent public perceptions and market requirements. In this regard, food safety standards were elevated and international trade regulations tightened. Policy and regulations governing environmental sustainability were put in place in many countries, requiring aquaculture producers to comply with more stringent environmental mitigation and protection measures. In order to respond to these environmental and consumer concerns on aquaculture production and to secure better market access, there is increasing interest in the certification of aquaculture production systems, practices, processes and products from aquaculture. In 2011, COFI approved the Technical Guidelines on Aquaculture Certification as an international instrument to provide the uniform basis for aquaculture certification. FAO Members, whilst endorsing the Guidelines, also recommended that FAO develops an Evaluation Framework to assess the conformity of public and private certification schemes with the Guidelines. Under this agenda item, the draft conformity assessment framework developed by FAO will be discussed and debated.

Applying spatial planning for promoting future aquaculture growth: Around the globe, the availability of and access to aquaculture zones and sites with favourable characteristics, including those areas that minimize interactions and conflicts with other activities, represent constraints for the expansion of the sector. Meeting the future demand for food from aquaculture will, to a large degree, depend on the availability of space for aquaculture. In most countries where aquaculture is new, a comprehensive and coordinated spatial planning to secure an adequate allocation of space in waters and land for sustainable growth of aquaculture is being developed. In countries where aquaculture is already well established, the spatial distribution of the sector has not been well-planned. This agenda

item attempts to raise awareness on the need for spatial planning to allocate space for aquaculture and to illustrate the benefits that can be derived from it when promoting sectoral growth.

Role of aquaculture in improving nutrition: opportunities and challenges: Fish is an excellent source of protein, but what makes fish a really unique food is the additional nutrients that can be found in fish in significant amounts. Fish has a complete package of nutrients, and the unique nutritional composition of fish is derived also from fatty acids and micronutrients (vitamins, minerals). Wild and farmed fish are healthy and are better alternatives to almost any other meats. Farmed fish have a more constant nutrient composition compared to their wild counterpart, whose environment, food and access to food varies during the year. In addition to being a good source of essential nutrients, aquaculture products also play an important role in replacing less healthy diets. On the other hand, one should also make sure aquaculture products do not replace important foods such as small indigenous fish species with a long tradition as a source of many essential micronutrients. This agenda item will discuss the significant role that aquaculture and fisheries could play in combating malnutrition; a subject that will also be highlighted during the Second International Conference on Nutrition (ICN-2) to be held in November 2014.

Special event on strengthening international cooperation for accelerating sustainable aquaculture development: This special event will set the scene for the exchange of information and experience on international cooperation in aquaculture. It contends that improving international cooperation in the sector is crucial if the latter is to continue growing so as to enable the world to meet the increasing global demand for safe and quality fish as well as other aquatic foods. The paper outlines some of the recent progress achieved in international cooperation in aquaculture, discusses its potential benefits and reviews some of the main vehicles used whilst exploring ways for strengthening such cooperation. In addition to training and capacity building, international cooperation in aquaculture has enhanced technology transfer and diffusion, amongst countries. Such cooperation has also led to harmonized regional aquaculture development strategies in some places. As a result of this



improved cooperation, aquaculture productivity has increased, food security and nutrition have been enhanced and both employment creation and income generation have been promoted along the value chain. International cooperation could be further advocated through forging of strategic partnerships, expansion of bilateral and South-South cooperation arrangements, the increase of direct foreign investment in the sector, encouragement of joint ventures, the promotion of greater use of consortiums in aquaculture and ensuring sustainability of existing networks.

For further details, including the provisional agenda and technical documents, please visit: http://www.fao.org/fishery/about/cofi/aquaculture

8th Session of the General Fisheries Commission for the Mediterranean Committee on Aquaculture

The Eight Session of the Committee on Aquaculture (CAQ) of the General Commission for the Mediterranean (GFCM) was held in Paris, France from 13-15 March 2013 along with the Fourteenth Annual Meeting of the Information System for the Promotion of Mediterranean Aquaculture (SIPAM, www.faosipam.org) network.

The session held on a biannual basis, was attended by 17 GFCM Members and by observers from the International Union for the Conservation of Nature (IUCN), the International Organization for the Development of Fisheries in Eastern and Central Europe (EUROFISH), the European Union (EU) funded project AquaMed and representatives of FAO and the GFCM Secretariat.

The Secretariat presented the intersessional activities of the Committee focusing on the activities carried out by its three Working Groups (WGs): the *Working Group on Aquaculture Sustainability (WGSA)*; the *Working Group on Site Selection and Carrying Capacity (WGSC)*; and the *Working Group on Marketing in Aquaculture (WGMA)*. The outcomes of a recently established fourth working group called *Working Group on the Black Sea (WGBS)* and the *LaMed project* focussed on interactions between aquaculture and capture fisheries in Mediterranean coastal lagoons were also presented.

The CAQ working groups have produced useful outcomes during the years in terms of lessons learnt and the sound methodology applied. The WGs have among others elaborated guidelines to identify Allocated Zones for Aquaculture (AZA); undertaken a preliminary assessment of aquaculture farmers' organizations; developed indicators as a means to strengthen the public perception of aquaculture, market competitiveness, environmental sustainability and social acceptability.

Delegates acknowledged the good results achieved by GFCM in terms of organized meetings, outputs of the working groups and secretariat support to Member countries. They also recognized that the dissemination of the outcomes produced by the working groups to aquaculture producers should be strengthened and capacity-building should be implemented through pilot projects involving a wider range of stakeholders.

V. Crespi, FAO

Plenary discussion during the Eight Session of the GFCM Committee on Aquaculture

The most relevant planned activities included in the CAQ 2013–2014 work plan are the following:

- Project for the elaboration of a Regional Review on the current status of aquaculture in the GFCM competence area and organization of a final workshop for the dissemination of results.
- GFCM aquaculture statistical yearbook publication on a biannual frequency.
- Regional survey on aquatic animal health and biosecurity in aquaculture.
- Regional survey on the main aspects related to certification and traceability in aquaculture.

The full report of the Eight Session of CAQ is available in the web site of the GFCM www.gfcm.org/gfcm/en

Further information can be obtained by writing to: Mr Fabio Massa (Technical Secretary of the GFCM-CAQ) Fabio.Massa@fao.org

4th Annual Meeting of the Aquaculture Network for Africa

The Aquaculture Network for Africa (ANAF) is currently composed of twelve African countries: Cameroon, Ghana, Kenya, Mali, Mozambique, Namibia, Nigeria, Republic of South Africa, Senegal, Tanzania, Uganda and Zambia. These countries decided to develop, through the assistance of FAO, an informal, flexible and efficient network of regional experts to promote and accelerate the development of aquaculture in the region.

ANAF aims to address the many common infrastructure, technological, policy, institutional, human capacity, research, and information gathering and dissemination problems of Member countries.

The fourth ANAF Annual Meeting, held at the Central Inn Hotel in Entebbe, Uganda, from 04 to 06 December 2012 achieved the following objectives: (i) described the steps for the establishment and management of national Aquaculture Advisory Group (AAG) and the national Aquaculture Farmer Orgnaizations (AFO) in the ANAF Member countries; (ii) adopted a strategy to turn ANAF into a functional inter-governmental organization (IGO) similar to the Network of Aquaculture Centres in Asia and the Pacific (NACA); and (iv) discussed and endorsed the ANAF work plan for 2013.

The meeting was attended by the ANAF National Focal Points from nine member countries, two international consultants, two representatives from NEPAD, one representative from the EU funded programme ACP FISH II (Eastern Africa), one consultant from the FAO Regional Office for Africa and one Aquaculture Officer from FAO, Rome.

Group Photo

The meeting conducted over three days, consisted of presentations by the international consultants, ANAF National Focal Points (NFP); halfday was dedicated to working group discussions of the three established task forces; and a final round-table discussion regarding the work plan and adoption of the report.

The first consultant's presentation focused on the findings of the consultancy report entitled "The role of AAG and AFO: lessons learnt from Zambia and Uganda's experiences and guidelines for the establishment of AFOs". The consultant elaborated simple guidelines for the ANAF countries wishing to facilitate the development and management of AFOs.

The second consultant's presentation "Towards an ANAF IGO: small steps for the final leap" provided conceptual and operational guidelines for the ANAF member countries to make decisions on how to proceed with the transformation of the network into a functional IGO.

Participants decided to create three task forces composed of ANAF members to work on the following subjects:

Task Force 1 on prospective host governments and a proposed schedule of government contributions;

Task Force 2 three-year Work Programme for ANAF; and

Task Force 3 ANAF Agreement and the other legal instruments with specific expert assistance from FAO's Aquaculture Branch and Legal Service.

The three task forces elaborated their terms of references and agreed to prepare three distinct reports defining the next steps that will lead ANAF member countries towards the establishment of the ANAF IGO.

The three reports will be presented and finalized at the fifth ANAF Annual Meeting to be held at the end of July 2013 in Dakar, Senegal.

More information can be obtained by writing to: Valerio.Crespi@fao.org

Bangladesh develops a National Aquaculture Development Strategy and Action Plan

Mohammad R. Hasan[1], Jiansan Jia[1] and Pedro Bueno[2]

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Bangladesh has hauled up its aquaculture sector to the ranks of the top aquaculture producers in the world; it was fifth in 2011 with an output of 1.52 million tonnes. Much of this production is from very small farms: the country has 4.23 million fishfarmers and 4.5 million farms with a combined area of 670 thousand hectares. Aquaculture has been rapidly growing but needs to grow even more to meet the protein requirements of a young and growing population. Fish now provides 60 percent of the protein in the people's diet. This growth and expansion has been guided by a National Fishery Policy formulated in 2006. The government felt that the widely anticipated rapid growth needed an updated guideline, which prompted the Ministry of Fisheries & Livestock (MoFL) to call for its review and update and requested FAO's assistance for this undertaking during the 29th Session of Committee on Fisheries (COFI) in 2011. Along with this request was one that was met through the FAO TCPF project TCP/BGD/3301: Identification and understanding of key technical, economic and social constraints to seed and feed production and management in Bangladesh that was implemented in 2012. This project became the platform for the review and formulation of an aquaculture strategy and action plan, which was informed by the country investment plan, national fishery policy, the plans for the fisheries and livestock sectors, and the results of the TCPF project on seed and feed.

Process

In collaboration with the MoFL, the FAO Representation in Bangladesh and the Aquaculture Branch (FIRA) organized the consultation workshop, designed to be widely participatory to reflect priorities of the major stakeholders of the aquaculture sector. Thirty-six participants representing government agencies, academic and R&D institutions, private industry

N. Ahmed, FAO

Harvest of Indian major and Chinese carps from a semi-intensive ploy culture farm in Mymensingh, Bangladesh

including farmers, civil society organizations, the WorldFish Centre, the Bangladesh Shrimp and Fish Foundation (BSFF) took part in the workshop. The process will lead to a final result that shall embody the aspirations of the people and the commitment to pursue those aspirations by the Government and the other stakeholders. That commitment shall be expressed in concrete and doable goals, strategic actions and specific activities, and the resources needed to execute the activities.

Strategy and Action Plan

The workshop strongly recommended, among others, a crop insurance programme, filling up at least 30 percent of the technical positions in the fisheries departments and institutions with women, a national selective breeding programme for important aquaculture species, implementation of the aquafeed act, a survey and characterization of the fisheries and aquaculture potential of all public water bodies, increase in the lease period of water bodies to 25 years, and other measures to assure that expansion is orderly and development is sustainable and equitable. A set of technical implementing guidelines for the Fish and Animal Feed Act shall be developed and a pilot feed quality analytical laboratory was proposed to be established. A communication support system for planning, management, enforcement and public information will be developed harnessing the power of the new information technology.

To jumpstart the implementation of the Action Plan, priority projects are proposed for development and initiation in the immediate term. These include, among others, stock improvement of commercially important fish species through a selective breeding programme; capacity building for training institutions and development of training and extension materials; and organization of fish farmers, traders and hatchery operators associations at the local and national levels.

M. Hasan, FAO

A pangas (striped catfish) farm in Trishal, Bangladesh. Aquaculture has been one of the fastest growing economic subsectors of the Bangladesh economy. More than four million fishfarmers mostly small-scale and over 8.5 million people derive livelihood from it directly and indirectly. It provides 60 percent of the animal protein in the people's diet. Its share of the GDP is 4.4 percent. Export revenue in 2012 was estimated at US$ 450 million

The Strategy and draft Action Plan and comprises four interlinked objectives – social, economic, ecological and institutional, 14 outputs and more than 50 activities.

The Government of Bangladesh was represented by Mr Syed Arif Azad, Director General of the Department of Fisheries and Mr Shamsul Kibria, Joint Secretary of MoFL. Keynote speaker Mr. Ujjawal Bikash Dutta, Secretary of MoFL stressed the need to review and update the guiding policy documents along with updating the Strategy and Action Plan to cope with the demands of the country and keep up with new scientific knowledge and experiences. FAO participants were Ms Rosanne Marchesich (FAO Representative a.i in Bangladesh), Ms Nurun Naher Begum (FAO Bangladesh), Mr Jiansan Jia and Mr Mohammad R. Hasan (FIRA, Rome, Italy) and Mr Pedro Bueno, International Consultant to FAO.

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Development of a Sub-regional Strategy for Improving Biosecurity (aquatic animal health) in the Sub-regional Countries of the Mozambique Channel

Background

White spot syndrome virus (WSSV), the most serious pathogen of cultured shrimp had affected almost all shrimp producing countries in Asia since the 1990s; as of 1999, at least 9 countries in the Americas were affected. Most recent outbreaks were reported in Brazil (2005), the Kingdom of Saudi Arabia (2010-2011), Mozambique (2011), Brunei (2012), and Madagascar (2012). In Asia alone, losses from WSSV outbreaks were estimated at USD 6 billion during 1992-1993 outbreaks; in the Americas, about USD 1-2 billion during 1999 outbreaks.

P.P. Blanc, APCM - PRCC project, Mozambique

WSSV was reported first in Mozambique (September 2011) and a few months later, in Madagascar (April 2012). The direct impacts of the disease were destruction of more than 600 tonnes of production in the two affected countries and cessation of farming operations for more than 1 year for the concerned shrimp farms.

Madagascar has about 5 603 km of coastline and 2 744 ha used for aquaculture. Mozambique has a coastline of 2 470 km and about 77 000 ha suitable for aquaculture. Tanzania has a coastline of 1 300 km and 3 000 ha of land available for aquaculture. The sub-region of "Canal de Mozambique" has an outstanding potential for shrimp aquaculture. This potential can be easily threatened by disease.

The World Bank requested FAO to facilitate the preparation of a sub-regional strategy on aquatic biosecurity (aquatic animal health). In order to achieve this, two main activities were carried out: (i) conduct of an aquatic animal health performance and capacity assessment of the three countries (Madagascar, Mozambique and Tanzania) using an FAO survey questionnaire carried out in February and March 2013; and (2) a 3-day sub-regional meeting participated by representatives from each of the three countries (Maputo Workshop)[1] to discuss the results of the survey and use these as basis for developing a sub-regional strategy. The latter was hosted by the Instituto Nacional de Desenvolvimento da Aquaculture (INAQUA) from 2-4 April 2013 in Maputo, Mozambique. The draft sub-regional strategy was presented by INAQUA during a regional stakeholder consultation (which involved a consortium of organizations and institutions interested in providing solutions and interventions to this current shrimp disease situation in the sub-region) that was held in May 2013 in Madagascar and organized by the World Bank.

Shrimp aquaculture in the Mozambique Channel and impacts of WSSV[2]

Shrimp aquaculture, representing the main source of aquaculture production for Madagascar and Mozambique, with 58.1 percent and 79 percent production, respectively, is an important contributor to socio-economic growth. Madagascar exports crustacean products to the European Union and in 2012, exported 9 829 tonnes of which 8 548 tonnes were shrimp with 4 952 tonnes derived from aquaculture. In Tanzania, frozen shrimp valued as USD 6.4 M and live shrimp valued at USD 708 168 were exported between 2005-2012 to several destination countries.

The incursion of WSSV resulted not only to production, employment and financial losses; the disease also impacted the inhabitants of areas concerned. The impact on employment was felt severely due to the absence of any economic activity or other livelihood alternative in those areas; the direct result was migration of people or small temporary activities which disorganized the main area activities. The medium- and long-term WSSV impact can be the limitation of the growth of the shrimp aquaculture sector, recognized as one of the main activities that can offer important employment with high socio-economic impact in remote areas of the sub-regional countries.

Strategy for Improving Aquatic Biosecurity (Aquatic Animal Health) for the Mozambique Channel Sub-regional Countries (Madagascar, Mozambique and Tanzania)

The Strategy **(Box 1)**outlines a long-term, agreed-upon programme to improve aquatic animal health capacity in the sub-regional countries of the Mozambique Channel, i.e. Madagascar, Mozambique and Tanzania. The programme identifies the activities of sub-regional and national interests and importance that can be addressed jointly by the sub-regional countries and the national aquatic animal health activities that must be accomplished by individual countries in order to implement the Strategy. This Strategy can be used to approach international organizations such as the FAO (through its Technical Cooperation Department), the World Organisation for Animal Health (OIE) and other regional and bilateral mechanisms, as well as the participating governments for possible internal and external funding and/or organizational support.

This Strategy is part of joint concerted efforts to address transboundary issues related to aquatic animal health management of the aforementioned countries. The Strategy recognizes the importance of human capacity building, and this is addressed primarily in the form of targetted training programmes including post-graduate training, workshops and research capacity building on various aspects of aquatic animal health management. The preparation of the full implementation plan of the Strategy will be an ongoing process. Each Programme Component may be accomplished by completion of a number of activities. These include actions to be taken by individual countries in support of their national aquatic animal health strategies and typically supported by the government and essential to successful completion of the regional activities. Sub-regional activities will be undertaken jointly by countries. A coordinating mechanism need to be established, e.g. a Regional Aquatic Animal Health Advisory Group consisting of regional and international experts or other mechanism/s that may be appropriate for the region.

Further information can be obtained by writing to Melba.Reantaso@fao.org or Rohana.Subasinghe@fao.org

Box 1: The Strategy includes a Vision and set of Guiding Principles for aquatic animal health in the Mozambique Channel and consists of eight Programme Components, within which are 12 Programme Elements containing a total of 41 Programme Activities. The eight Programme Components address the broad themes of:

1. Biosecurity Governance
2. Sub-regional Preparedness/Response and Contingency Plan for Shrimp Disease Emergencies
3. Diagnostics, Surveillance and Reporting
4. Prevention and Management of Risks from Exotic, Emerging and/or Unknown Aquatic Pathogens
5. Promotion of Sustainable Aquaculture Development and Responsible Investment in Shrimp Aquaculture
6. Assessment of socio economic benefits/potential and risks, technical feasibility and environmental impacts of further shrimp aquaculture development in the Indian Ocean sub-region
7. Institutional Strengthening and Targetted Capacity Building on Aquatic Biosecurity
8. Regional Collaboration Communication and Networking on Information and Shared Resources.

[1]The Maputo Workshop which developed the Sub-regional Strategy was participated by Dr Ralaimarindaza Luc Josué (Madagascar); Dr Ana Paula Baloi, Ms Isabel Omar and Mr Philip-Pierre Blanc (Madagascar); Dr Hamisi L. Nikuli (Tanzania); and Dr Melba B. Reantaso (FAO).
[2]Information were taken from Draft Strategy for Improving Biosecurity (Aquatic Animal Health) in the Sub-regional Countries of the Mozambique Channel (Madagascar, Mozambique and Tanzania), Workshop Report (in preparation).

Spatial Planning Development Programme for Marine Capture Fisheries and Aquaculture

José Aguilar-Manjarrez[1], Alessandro Lovatelli[1] and Fabio Carocci[2]
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A strategy on spatial planning is considered one of the essential requirements for ensuring sustainable marine capture fisheries and aquaculture development in the RECOFI region.

Spatial planning is an instrument that promotes and facilitates integrated management of land, water and living resources for the development and expansion of fisheries and aquaculture in a sustainable and equitable way. Spatial planning is a great tool which can be used in analyzing any issue or problem that has a spatial perspective, such as the identification, analysis and possible allocation of specific geographical areas to be used for marine capture fisheries and aquaculture or for other purposes.

The May 2011 session of RECOFI held in Rome, agreed to adopt a regional spatial planning approach to marine capture fisheries and aquaculture for the region and, within available resources, to provide the necessary support for follow-up action for the implementation of a "Regional Strategy".[1] As a follow-up, a regional technical workshop was held in Cairo, the Arab Republic of Egypt (25–27 November 2012), that finalized a detailed "Spatial Planning Development Programme" to support the "Regional Strategy" including preliminary budget estimates for capacity development.

The significant outputs of this workshop were:

- **Awareness and capacity building on spatial planning for marine capture fisheries and aquaculture** — FAO provided participants with the required knowledge on key concepts such as the ecosystem approach to aquaculture and fisheries (EAA/EAF), marine spatial planning, aquaculture zoning, carrying capacity, and also provided insight on spatial analysis skills available among RECOFI countries. Each RECOFI Member provided feedback on recent and relevant spatial planning projects for its country.
- **Survey Questionnaire on RECOFI Spatial Planning Development Programme for Marine Capture Fisheries and Aquaculture** — countries fully cooperated in the completion of a questionnaire, the summary and analysis which were presented and further discussed during the workshop. This served as basis for the development of a regional programme.
- **Proposal for a Spatial Planning Development Programme for Marine Capture Fisheries and Aquaculture** — this proposal, presented and further developed during the workshop, outlined the components of a "Regional Strategy" to implement such a programme.
- **Concept notes on pilot projects on marine fisheries and aquaculture** — workshop participants identified potential pilot projects which were elaborated in detail by international consultants after the workshop and in consultation with workshop participants.

The Regional Strategy

The vision of the "Regional Strategy" is "*To illustrate how spatial planning tools are one essential element to achieving sustainable clean, healthy, safe, productive and biologically diverse marine seas in the RECOFI region, and how they allow for mariculture and marine fishery production activities to be maximized while at the same time taking into account the other users of the marine space.*" The guiding principles that underlie the outlined components of the strategy are founded broadly on the ecosystem approach to aquaculture (EAA) and the ecosystem approach to fisheries (EAF), allied to the need to ensure that all legitimate uses of the marine space can continue on the basis of sustainability. The strategy is more specifically guided by the principles of Marine Spatial Planning.

Group photograph of workshop participants[2]

Spatial Planning Development Programme

The Regional Strategy completed in Qatar in 2010 and endorsed by the Commission in May 2011 sets out four programme components, 12 elements and 30 activities. The purpose of this current Spatial Planning Development Programme is to address some of the key elements of the Regional Strategy, essentially based on all programme components, eight of the 12 elements and 14 of the 30 activities from the 2010 Regional Strategy.

Conclusions and follow-up actions

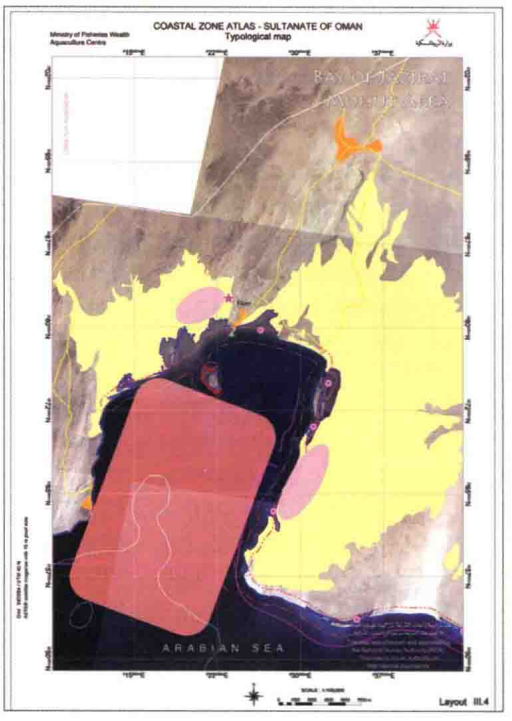
A "Regional Strategy" and a Spatial Planning Development Programme were formulated to address management needs of the RECOFI marine area concerning spatially-based issues for marine capture fisheries and aquaculture development. This Development Programme contains a series of logical and attainable measures for sustainable development of the sector, with the longer-term goal of the various users of the marine space working in harmony for the benefit of all, and for the natural ecosystems to be functionally in balance and moving towards a situation where maximum marine productivity is attained and maintained.

The Regional Strategy's primary strength is that it will allow for the delivery of spatial planning tools to enable a wide spectrum of analyses to address spatial problems for fishery and aquaculture planning and management. Spatial planning tools will not solve every marine management problem but they will provide the spatial framework within which RECOFI member countries will have more options to solve problems through sound decision-making.

A key regional activity and a core component of the "Regional Strategy" will be to identify RECOFI countries and appropriate government agencies who are willing to cooperate in developing national and regional plans (Marine Spatial Plans) to improve the environmental, social and economic conditions of the RECOFI region and to agree on cooperative working environments including the need to share data. It will be up to the RECOFI Members to address issues concerned with governance-related recommendations contained in the "Regional Strategy" at government level, including, most importantly, acceptance by RECOFI countries on current approaches to marine spatial planning, fishery zoning, and the adoption of EAA and EAF.

RECOFI will also be responsible for allocating resources to fund the Development Programme components, and likewise, it will be the responsibility of each Member country to implement their pilot projects and/or to seek synergies for collaborative work with neighbouring countries and/or countries with similar needs and priorities.

Potential areas for shrimp farming (two large pink circles) and for Sea Cucumber restocking (light orange rectangle). Bay of Jazirat. Muhut Area.



Source: Ministry of Fisheries Wealth. 2010. Sultanate of Oman. Aquaculture centre. Atlas of suitable sites for aquaculture projects in the Sultanate of Oman. pp 233.
www.mofw.gov.om/AquaOman/public/images/ATLAS%20final%206%20August%202010.pdf

A draft workshop report[3] was distributed at the seventh session of RECOFI, held in Tehran, Islamic Republic of Iran from 14 to 16 May 2013. The Commission requested feedback on the draft report to allow for its completion and distribution in July 2013, and agreed that efforts should be made to obtain funds to proceed with an "operational phase" so to start with its implementation.

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[1]FAO/Regional Commission for Fisheries. 2011. Report of the Regional Technical Workshop on Spatial Planning for Marine Capture Fisheries and Aquaculture. Doha, the State of Qatar, 24–28 October 2010. FAO Fisheries and Aquaculture Report. No. 961. Rome, FAO. 118 pp. (also available at www.fao.org/docrep/014/i2054e/i2054e00.pdf).
[2]Participants included two international consultants on marine capture fisheries (Dr Geoff Meaden) and aquaculture (Mr Patrick White) respectively, and one national consultant (Dr Peter Longdill) on GIS from the State of Qatar.
[3]FAO/Regional Commission for Fisheries. (forthcoming). Report of the Regional Technical Workshop on Spatial Planning Development Programme for Marine Capture Fisheries and Aquaculture. Cairo, the Arab Republic of Egypt, 25–27 November 2012. FAO Fisheries and Aquaculture Report. No. 1039. Rome, FAO.

Biosecurity governance in Indonesian's shrimp aquaculture kicks off through TCP/INS/3402

Indonesia is the world's 4th most populous country with >239 billion people as of 2010. About 70 percent of the population depend on agriculture activities (including aquatic food production). The sector contributed around 15.34 percent of the gross domestic product (GDP); average GDP growth during the fourth quater 2011 was 1.50 percent. Since most of Indonesian people are farmers, therefore food self-sufficiency especially rice is a priority for the Agricultural Ministry's main programmes.

As an archipelagic country with more than 14 700 islands, capture fisheries and aquaculture are the main sources of income of the coastal communities. The Ministry of Marine Affairs and Fisheries (MMAF) Strategic Plan (2010-2014) has a fish production target of 22.39 million tonnes in 2014; twice higher than that achieved in 2009. With capture fisheries leveling off, it is expected that aquaculture production will increase. The sector provides employment to about 13.8 million people. The share of shrimp in total aquaculture production in 2009 was 348 000 tonnes and it is the government's aspiration to attain a 100 percent increase by 2014. Thus, aquaculture, particularly shrimp, is of great importance to Indonesia.

During the 1990s, Indonesia was the second largest black tiger shrimp (*Penaeus monodon*) producer in the world. Recurring problems such as environmental deterioration and diseases forced the closure of more than 50 percent of intensive shrimp industries and production stayed below 100 000 metric tonnes. In 2003, because of the important role that shrimp played in Indonesian export earnings, the government embarked on a programme to intensify shrimp culture. As part of efforts to increase shrimp production, the white-legged shrimp (*Penaeus vannamei*) from Brazil was introduced to the country. The period 2001 to 2002 became a transition period from *P. monodon* to *P. vannamei;* the latter has become the major cultured shrimp species in Indonesia. Production from 159 997 metric tonnes in 2002 further increased by 20.5 percent and achieved a production of 192 912 metric tonnes.

Then problems with diseases with this species became apparent. Taura syndrome virus (TSV) and White spot syndrome virus (WSSV) were detected in the early 2003. In 2006, infection with Infectious myonecrosis virus (IMNV) was reported in Situbondo, East Java based on an active surveillance of mortalities in the small-scale shrimp clusters. Following the 2006 major outbreak of IMNV, the government through the Fish Quarantine Board acted rapidly by adding IMNV to the List of Quarantine Fish Disease under Ministerial Decree No. 17/2006 issued by MMAF. In response to such outbreaks, simple network communication and reporting system had been established, especially among experts, private sectors, and government. As a result, Ministrial Decree No. 32/2006 was released. Active surveillance was carried out by research institutions and the private sectors. The disease appeared to have been contained (through improved farm level biosecurity and good aquaculture practices) during the period from the serious outbreaks in 2006 until 2008. Nonetheless, further outbreaks of IMNV occured in Lampung in 2009, and hit quite a number of big shrimp producers. But due to the lack of a systematic emergency response system and capacity, the outbreaks continued since 2009 until present. Although a national aquatic animal health (NAAH) strategy has been prepared during the outbreak of another viral disease, koi herpesvirus which affected the important food fish common carp and the high value ornamental fish koi carp, in 2002, the strategy has not been reviewed and there is now a need for it to be reactivated.

Past experience revealed that such efforts are not sufficient and addressing the issue of diseases in aquaculture require a more systematic and vigilant approach to anticipate further outbreaks and reduce losses. The TCP/INS/3402 "Development of preventive aquatic animal health protection plan and enhancing emergency response capacities

to shrimp disease outbreaks in Indonesia" has the overall development goal of supporting sustainable aquaculture development for food security and economic empowerment through effective biosecurity governance. The TCP project officially signed in April 2013, has a duration of 18 months (NTE of September 2014) and being implemented by the Division of Fish Health and Environment (DFHE), Directorate General of Aquaculture (DGA) of MMAF.

Managing for resilience: effective biosecurity governance produces healthy shrimp

Through improved and effective biosecurity, countries can grow food more efficiently, increase their income and thus improve their resilience, reduce their vulnerability and enhance their ability to respond to the impacts of higher food prices and other threats to food security such as diseases.

A Project Inception Workshop held on 14 May 2013 laid down the detailed project implementation work plan for achieving the 4 expected outputs, i.e. (1) surveillance systems for aquatic animal pathogens/diseases established and functional and an aquatic animal health information system improved, (ii) aquatic animal disease emergency preparedness guidelines improved and simulation exercise initiated, (iii) trainers and shrimp farmers trained on shrimp biosecurity and best management practices, and (iv) a National Aquatic Animal Health (NAAH) strategy updated and implementation plan approved.

A NAAH Strategy workshop, held on 15-16 May 2013, made a strong headway and achieved the following:

(i) an **Aquatic Animal Health Task Force** (AAH Task Force) was formed chaired by Ir Maskur (Director of DFHE and TCP National Project Coordinator), supported by two Vice-chairs (Dr Sukenda and Ir Mukti) and 9 members with multi-disciplinary background on aquaculture, epidemiology, molecular biology, bacteriology, parasitology, pathology and socio-economics.

(ii) **elements of the NAAH strategy** was finalized from 16 to 9 [i.e. legislation, policy and institutional framework; surveillance, monitoring and reporting for diseases; aquaculture drugs and residue; risk analysis, quarantine and health certification; disease control (prevention, treatment and eradication); emergency preparedness and contingency planning; aquatic animal health services and diagnostic laboratories; research and technological developments including outreach; national and international networking (communication and information system); human resource development and capacity building; and resource mobilization].

(iii) the **National List of Aquatic Pathogens** was examined in great detail and harmonized the listing criteria based on the current quarantine list criteria, the OIE criteria and additional criteria provided by the quarantine officers. As a result, the list has been revised to contain the following:

- **Crustacean diseases:** 16 diseases (11 from quarantine list and 5 new);
- **Finfish diseases**: 10 diseases from quarantine list and 4 to 5 diseases for national control purposes;
- **Molluscan diseases:** 12 from quarantine list consisted of 5, 1 and 6 diseases of abalone, green mussel and oysters, respectively.
- **Aquatic plant diseases:** 2 diseases

Progress report on TCP implementation will be made through future issues of FAN.

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Support to the South-South Cooperation between Namibia and Viet Nam (GCP/NAM/014/SPA)

This article describes the progress made on the project GCP/NAM/014/SPA "Support to the South-South Cooperation (SSC) Technical Assistance Programme between Namibia and Viet Nam" which aims at providing technical assistance in support of the development of aquaculture in Namibia through the deployment of SSC experts and technicians from Viet Nam, during the period of 2010–2015, under the leadership of the Ministry of Fisheries and Marine Resources (MFMR) of Namibia.

This project is managed through a tripartite agreement between the Government of Namibia, the Government of Viet Nam, and FAO, and funded by the Government of Spain. FAO's role is to facilitate the implementation of the non-operational aspects of the SSC programme and to provide regular backstopping, while the Department of Aquaculture (DoA) of MFMR concentrates on the technical and operational aspects.

A 10-day backstopping mission composed of Mohammad R. Hasan, Valerio Crespi (Aquaculture Officers) and Madhy M. Bamba (Food Security Officer) was undertaken in November 2012. This mission reviewed the progress of project implementation in relation to the work plan, provided the necessary technical advice and recommendations for the smooth implementation of these activities; and participated in the annual review of SSC Programme.

A Project Team composed by 12 Vietnamese experts (including one Team Leader and nine technicians) and officers from the Directorate of Aquaculture (DoA), carried out tangible achievements in relation to the 2012 work plan. These include in particular, (1) substantial progress made on seed production of North African catfish (*Clarias gariepinus*) and three-spotted tilapia (*Oreochromis andersonii*); (2) six study proposals were prepared including the collection of two tilapia strains (Onavivi and Okavango strains) for selective breeding programme; and (3) completion of a the study tour to Viet Nam.

The six study proposals, related to project output onenhanced national capacities of the DOA to identify and promote improved aquaculture practices and technologies were prepared by the Project Team in cooperation with FAO and will be carried out at the Inland Aquaculture Centre (IAC) located in Onavivi and Ongwediva, in Kamatjonga Inland Fisheries Institute (KIFI), and at the Swakopmund National Marine Information and Research Centre. The subjects of the study are the following:

1) comparative assessment of the growth performance of three-spotted tilapia (*O. andersonii*) fed on locally produced sinking and imported floating pellets;
2) production of all male three-spotted tilapia and Mozambique tilapia (*O. mosambicus*) through hormonal sex reversal techniques by application of 17 α-methyl testosterone;
3) domestication of largemouth bass (*Microlepterus salmoides*) as a potential candidate species for aquaculture in Namibia;
4) establishment of a fish museum at KIFI;
5) acclimatization of African river prawn (*Macrobrachium vollenhovenii*), a potential freshwater prawn species for aquaculture practices in Namibia; and
6) development of a national aquaculture extension strategy and aquaculture extension material.

Within the framework of the SSC programme, three small-scale community-based aquaculture projects have been proposed for FAO technical clearance and subsequent funding. These projects mainly focus on fish farming integrated with agriculture and animal production which can have demonstration impact on the communities promoting aquaculture and its direct benefits to the stakeholders. Project activities will also be used for hands-on training purposes for different stakeholders living in the community.

A coordination meeting, organized with a Spanish Cooperation mission to Namibia identified possible synergies between the Namibia/Viet Nam and FAO and other Spanish-funded projects in Namibia. The meeting discussed ways of strengthening aquaculture skills through support of tertiary institutions and management and production capacity of existing research and production aquaculture centers in Namibia; and construction of a new tilapia hatchery at the Caprivi Inland Aquaculture Center. An updated status of the Spanish-funded aquafeed plant (in Onavivi IAC) based on a feasibility study which determined whether the existing feed plant can be modified to install a steam boiler and a new floating pellet extruder.

Through the execution of this 5-yr programme, Namibia will acquire enough experience and technical capacities to implement the planned activities leading to the development of a sustainable national aquaculture sector.