

Support to the Secretariat of Rural Development for the Preparation of an Aquaculture and Fisheries Master Plan for the State of Puebla in Mexico - UTF/MEX/071

Apoyo a la secretaria de desarrollo rural de Puebla en el desarrollo de cadenas acuícolas y elaboración del plan rector para la acuicultura y la pesca del Estado de Puebla 2007-2011

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INTRODUCTION

The relevance of aquaculture as a production industry in Mexico is now clearly defined in the recently approved General Law for sustainable fisheries and aquaculture in Mexico (24 July, 2004). This new law defines aquaculture as being a sector of public interest and national security. The law allocates the responsibility for the development of fisheries and aquaculture to each state. Chapter 13 of this new law entitles states to prepare their own master plans. In parallel to the national level master plan for aquaculture being prepared by the National Commission for Aquaculture and Fisheries (CONAPESCA) and the Center of Biological Investigations of the Northwest (CIBNOR), the regional plans, and the plans and programmes at states levels are gaining importance.

AQUACULTURE AND INLAND FISHERIES IN PUEBLA

Puebla is a Mexican state located in the center east of the country, to the east of Mexico City. Puebla does not have a coastline and covers an area of about 33,919 km². The terrain is mostly mountainous and it is the 5th most populated State in Mexico.

The State of Puebla can be divided in three climatic zones; cold,

temperate and warm. Cold zones are suitable for trout culture, temperate zones are not adequate for commercial aquaculture and warm zones are the most suitable zones for aquaculture development.

Main aquaculture production in terms of volume are derived from carp (*Ciprinus carpio carpio*), trout (*Oncorhynchus mykiss*) and tilapia (*Oreochromis Niloticus*), mostly for the domestic market. Trout culture is well established and has reached its maximum growth; however, current management practices can be improved to increase production. Tilapia culture has been identified as having great potential for commercial aquaculture but marketing strategies and financial assistance are needed for its development. Carp production is mainly derived from capture based aquaculture and is designed to increase food security but current practices also need to be improved. Additional species for culture in Puebla are mainly catfish (*Ictalurus punctatus*), shrimp (*Litopenaeus vannamei*), artemia (*Artemia Franciscan*) and baby lobster (*Cherax quadricarinatus*).

Fish farming in Puebla is mainly carried out in raceways or in earthen ponds with lining, some

small scale initiatives for cage culture exists for tilapia and catfish and there is potential for growth. Total aquaculture production for 2006 was about 5,286 tonnes mostly destined for the domestic market. There are a total of 11 hatcheries; however, about half of the fingerlings need to be imported to satisfy the demand.

Fish consumption has doubled since 2000; in fact, it is well above the national annual average growth rate of fish consumption. However, proper fish utilization and marketing mechanisms need to be strengthened and improved.

Fish diseases have been identified by many producers but mass mortalities have not been recorded. Most producers have basic education (primary school). Training and technical experiences are highest for trout, less for tilapia and least for carp. Most producers do not monitor/record production. Technical experience on aquaculture at the Secretariat of Rural Development (SRD) is considered low.

Inland fisheries, is an incipient activity in the state, and is carried out in reservoirs and natural waterbodies. Most carp production is derived from capture-based aquaculture. A

total of 207 vessels and 2 060 fisherfolk were reported in Mexican fishery statistics for 2006. Other fishing activities are carried out in rivers and other reservoirs, for species such as the apple snail (*Pomacea patula*), freshwater prawn (*Macrobrachium sp.*), and axolotl (*Ambystoma tigrinum*) among others, but no statistics are available and efforts need to be made to conduct research to better determine their use for stocking fish seed in reservoirs.



La Preciosita farm (intensive Trout culture in concrete tanks and raceways with a restaurant)

THE PROJECT

The main goal of this project is to promote the sustainable development of aquaculture and inland fisheries in the State of Puebla.

The immediate objectives of this UTF were to assist the government of Puebla, the SRD, specifically the Aquaculture Department (AD), to prepare and organize:

1. an aquaculture and inland fisheries sectoral review;
2. a master plan for aquaculture and inland fisheries for 2007-2011 that will mainly include policy formulation, strategic development recommendations and action plans;
3. one "consultation workshop" on the current state of aquaculture in Puebla and the results of the master plan; and three "capacity building" workshops on environmental management and the Ecosystem Approach to Aquaculture (EAA), technical lectures on catfish cage culture practices; and simple methods for recirculation systems.

As requested by the SRD and the AD in Puebla, the master plan also provides a fourth component on key recommendations for business plans for aquaculture development that are feasible to implement in Puebla.

The project commenced in December 2007 and was completed in September 2008. Mr Francisco Javier Martínez Cordero served as the National Project Coordinator as well as the consultant on socio-economics and fishery planning while Mr Antonio Garza de Yta acted as the national consultant on Aquaculture. Backstopping was provided by Mr Jorge González de la Rocha (FAORLC) and Mr José Aguilar-Manjarrez (FIMA). Budget of project did not allow for direct participation of FIEP, however, some technical advice was kindly provided by Ms Cecile Brugère.

ASSISTANCE/RESULTS

The master plan identifies political priorities for aquaculture and inland fisheries development in Puebla, provides a strategy with objectives, specific actions for short-term implementation and also sets the stage for medium- and long-term actions. The formulation of this plan was done in a participatory and democratic process using structured questionnaires, interviews, field visits and workshops. The main stakeholders involved in the development of aquaculture were: producers, government agencies, universities, regulation institutes,

and environment agencies for land and water use, etc. Therefore, this master plan provides a common vision by the state government and its society for the sustainable development of aquaculture.

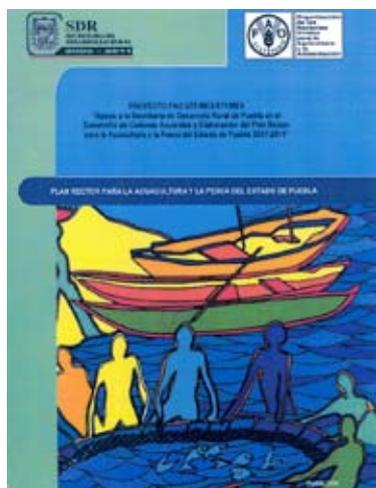
CONCLUSIONS AND RECOMMENDATIONS

Puebla is a state with important levels of population marginalization: 70 percent of the municipalities are classified as very high or highly marginalized. Thus, it is hoped that aquaculture will help reduce poverty, increase household food security, and generate income.

Factors that favour the growth of aquaculture in Puebla include: (1) high fish consumption; (2) value-added practices to aquaculture products creating restaurants adjacent to the fish farms and (3) increased financial support by state and federal governments.

The master plan was presented and submitted to the Governor of Puebla, Mr Mario Marín Torres in a ceremony held in Puebla on 24 September 2008. Thus, the State of Puebla is the first state in Mexico to have a master plan for sustainable aquaculture and fisheries development for the next 30 years. Undoubtedly, the plan will

serve as a model for other states in Mexico. Therefore, FI's role in this project is very relevant and timely when the surge for "sustainable" aquaculture development becomes more evident in Mexico.



Master plan for aquaculture and inland fisheries in Puebla for the period 2007-2011

The objectives of this project were met. The achievements of this project should provide the state government with the momentum to continue the implementation of the action plan at the short-, medium- and long-term for the responsible and sustainable development of fisheries and aquaculture in Puebla. This process is continuing and the SRD and AD in Puebla

should try to make every effort to continue consultation with relevant stakeholders.

FOLLOW-UP ACTIVITIES

Action plans identified include five state programmes and one information system: (1) state programme for development of aquaculture technology; (2) state programme for capacity building on aquaculture practices; (3) state programme for aquaculture zoning; (4) state programme for marketing aquaculture products; (5) state programmes for health management and aquaculture and fisheries information systems.

A total of 76 short-term action plans (1–3 years) were also identified, amongst these, the most important that can be implemented within one year include: (1) establishment of a state council for the sustainable development of aquaculture; (2) creation of a state law for sustainable fisheries and aquaculture; (3) zoning of aquaculture; (4) creation of the state aquaculture and fisheries information system; (5) optimization and prioritization of species and culture systems; (6) research on endemic species for culture; (7) international training

courses on aquaculture practices for key personnel at SRD; (8) collaboration with Mexican research centres; (9) initiation of activities on: health management; capacity building and marketing.

Funding permitting, there are vast areas where FI could assist in the near future to guide SRD/DA in the development and implementation of some of the ten development axes¹ identified by the master plan. Specific opportunities for collaborative work between the SRD and FAO identified in this project are: genetic improvement for trout, tilapia and catfish; assistance in developing a state law for aquaculture and fisheries; capacity building on aquaculture practices at all levels; guidance on carrying capacity and zoning; technical assistance on carp culture; and guidance in creating demonstration units for freshwater lobster.

The master plan was based on the CCRF and makes general reference to the importance of the EAA principles² for the implementation of the master plan. Therefore, future guidelines on EAA to be completed by FIMA during the first quarter of 2009 will assist Puebla in making the best use of an EAA. In fact, Puebla could serve as a model for the implementation of EAA guidelines.

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Technological Institute for Agriculture (demonstration unit for Tilapia culture in earthen ponds)

¹The ten development axes identified by the master plan are: (1) research and development, human resources and capacity building; (2) natural resources; (3) health management, biosecurity and safety; (4) institutional strengthening; (5) legislative framework; (6) fish utilization and marketing; (7) economic environment; (8) food security (9) organizations; and (10) fish stocking and care for endemic species.

²Soto, D.; Aguilar-Manjarrez, J.; Hishamunda, N. (eds). 2008. Building an ecosystem approach to aquaculture. FAO/Universitat de les Illes Balears Expert Workshop. 7–11 May 2007, Palma de Mallorca, Spain. FAO Fisheries and Aquaculture Proceedings. No. 14. Rome, FAO. 221p. (available at <ftp://ftp.fao.org/docrep/fao/011/i0339e/i0339e.pdf>).