Experimental Integrated Farming Systems in Mexico

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Experimental chinampas at El Morro de la Mancha Research Station, Vera Cruz. Crop wastes are being used for composting.

Mexico, like many other Latin American countries, is beginning to recognize the potential of integrated agriculture-aquaculture systems in food production. However, Latin American experience in fish husbandry is limited compared to that of Southeast Asian culturists. In September 1981, Dr. K. Hopkins of ICLARM and the author visited projects of the Instituto Nacional de Investigaciones sobre Recursos Bioticos (INIREB) to advise on research planning and technology development. INIREB has worked on integrated farming systems since 1976, concentrating at first on adaptation of traditional 'chinampa' systems (essentially raised strip fields in swampy areas, surrounded by water channels), and diversifying since 1978 into animal-biogas-fish systems.

Chinampas

Chinampas have been used for agriculture and horticulture in Mexico since Mayan times. They are variable in size and in land/water ratio used. In old chinampas, such as those at Mixquix, the water channels are not managed for fish production. In Tabasco State, in an ambitious scheme INIREB has created almost 50 ha of chinampa land in swamp country for distribution to the local Chontal Indians. The chinampas here are separated by water channels 20 m wide and the total water area is also about 50 ha. In its research station at El Morro de la Mancha, INIREB has some small experimental chinampas for microphagous and herbivorous tilapias (*Sarotherodon aureus, Oreochromis niloticus* and *Tilapia rendalli*).

Integrated Farms

INIREB is working at a number of community-owned experimental farms as well as at El Morro de la Mancha on crop-animal-biogas-fish integrated systems. At Buenavista, Vera Cruz, pigs are raised below chickens and eat their manure. Pig manure, in turn, produces biogas and the digester effluent fertilizes tilapia ponds. At San Miguel Tzinacapan, Puebla State, at a much higher and cooler location, a polyculture of *Tilapia rendalli, Ctenopharyngodon idella* and *Cyprinus carpio* is fertilized with biogas digester effluent from a digester utilizing pig and chicken wastes. At El Morro de la Mancha, cow manure goes to a biogas digester to yield 2,000 liters of methane daily (enough for the needs of a family of four). The effluent fertilizes polyculture ponds of tilapia and prawns.

Experimental pond receiving biogas digester effluent, Buena Vista, Vera Cruz.

Research Approach Needed

It seems clear from INIREB's work that integrated farming systems could have a big future in Mexico. The tropical lowlands of Vera Cruz and Tabasco States in particular seem well-suited for the techniques developed in Southeast Asia and their combination with traditional Mexican systems such as chinampas. First, however, a research approach is needed to understand the interrelationships of the various components of these integrated systems and to work out management guidelines.

Dr. H. Luis Morales who directs INIREB's aquaculture program inspects a water channel in an experimental chinampa; El Morro de la Mancha Research Station, Vera Cruz State.