China's GIAHS Conservation: Practices and Experiences

Taking Traditional Rice-fish Agriculture as an Example

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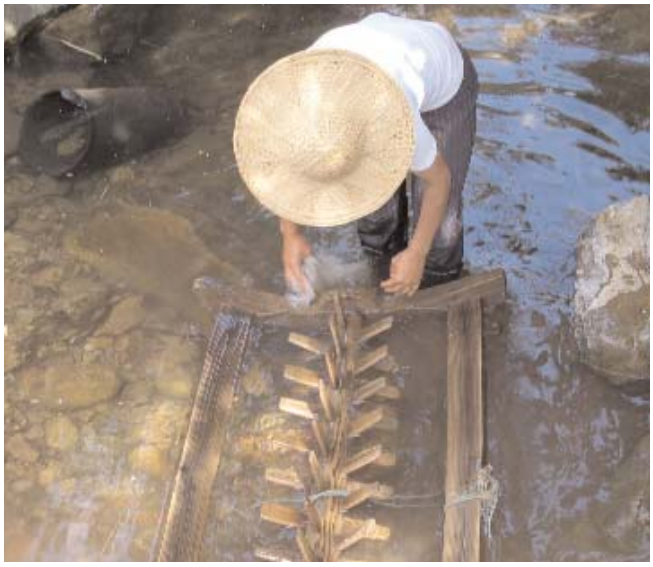
Long History of Agricultural Development and Plentiful Agricultural Heritages

With a long history of thousands of agricultural development, Chinese farmers have been searching many agricultural practices adaptive to different natural conditions. These practices or models are not only the synthetic application of traditional Chinese philosophy but also the foundation of modern ecological agriculture which has much positive influences on the sustainable agriculture movement throughout the world. Among the plenty of traditional agricultural models, rice-fish agriculture is a typical one which has been chosen as one pilot site of GIAHS project.

In Asia fish has been farmed in wet rice fields over a long history. A Chinese clay plate dating to the Han Dynasty 2000 years ago shows a fish swimming from its pond into a rice field. Ecological symbiosis exists in the traditional rice-fish agricultural system: fish provides fertilizer to rice, regulates micro-climatic conditions, softens the soil, disturbs the water, and eats larvae and weeds in the flooded fields; rice provides shade and food for fish. Furthermore, multiple products and ecological services from the co-ecosystems are beneficial to local farmers and the environment. The high quality food of fish and rice are helpful to maintain farmers' nutrient and living standard: the reduced cost and labour increases the productive efficiency, and, especially, the reduction of chemical fertilizers, pesticides and herbicides for insect and weed control helps in agro-biological conservation and field environmental protection. The rice-fish system in Longxian Village of Zhejiang Province demonstrates an ingenious approach to generating ecological, economic and social benefits through encouraging essential ecological functions.

Apart from this, the others include karez (an irrigation system of wells connected by underground channels), dike-pond system (a complex system with silkworm, fish, pond, mulberry), intercropping, terrace planting, agroforestry and so on. However, many traditional agricultural practices are facing much threatens from the impact of development idea and modern agricultural techniques and some are almost disappearance. For example, the rapid industrialization and urbanization made the dike-pond system in The Pearl River Delta area decrease from more than two million ha in 1950s to less than 200 ha at present. The other example is the traditional rice-fish agriculture. The total area of rice-fish in China increase from 0.667 million ha in 1959 to 0.985 million in 1986 and 1.532 million in 2000, but decrease since 2000. The current area is less than 1.4 million ha.



Main Efforts Done

Along with the international movement of sustainable development since 1980s, different levels of Chinese governments actively have been promoting to the development and extension of traditional agricultural practices. At the same time many ecologists and agronomists have been studying this field. Just for this reason, a new scientific branch called China's eco-agriculture (which is similar to the so called GIAHS in nature) emerged and was gradually perfected. In recent years, the Center for Chinese Agricultural Policy and the new established Center for Natural and Cultural Heritage affiliated to the Institute of Geographic Sciences, Chinese Academy of Sciences, have been summarizing the eco-agricultural models and published some research reports, for example, Agroforestry in China, Agro-ecological Farming Systems in China, Eco-agriculture: The Theories and Practices of Sustainable Agriculture n China, Techniques and Models of Eco-agriculture and so forth. Since 2004 some scientists have been making efforts in Rice-fish Agriculture. The works about this project since June 2005 are as following:

June 9-11, 2005, The Workshop on Inception of Rice-fish Agricultural System was held in Hangzhou and Qingtian. Many media reported this activity and obtained great response. Later, a book about this activity was edited and printed by Qingtian County. The county-based local committee and CNACH-based Scientific Committee for GIAHS conservation have

been established. The National Committee and Provincial Committee will be established before long. Also, the Center for World Agricultural Heritage was established by some local farmers and overseas Chinese.Related research activities have been made and some research reports have been finished. The ecological mechanism and adaptive management of the rice-fish system have been listed the National Foundation Research Project (973) and Knowledge Innovation Project of CAS respectively.Up to now, 5 papers published or will be published in some Chinese journals liking *Journal of Geographical Research, Resources Research, Ecological Economy* and *Regional Research and Development.*

Some investigations have been made during PDF-B including agricultural biodiversity, social and economic conditions, willing to pay of local farmers and outside tourists, micro-climatic conditions, and field ecological elements. Some training courses were made for local governors, farmers and other stakeholders.The master plan for rice-fish system conservation and the national framework for GIAHS project have been made. The Workshop of Natural and Cultural Heritage Conservation was held in June 10, 2006, the first Chinese Cultural Heritage Day. Many representatives from international organizations, government organizations, universities and research institutions participated the workshop. *Science and Technology Daily* and *Science Times* reported this activity. July 28-30, 2006, the Multi-stakeholders Process Workshop on Rice-fish Agriculture was held in Qingtian. *Guangming Daily*, *Science and Technology Daily* and local media reported this activity. Based on the reports in this workshop and other related materials, *Muli-Stakeholders Process for the Conservation of GIAHS*, the first book of *Series of Agricultural Heritage Research* was printed by Chinese Environmental Sciences Press. Just as mentioned before, China has plenty of traditional agricultural heritage systems. We will try to systematically make research about China's different kinds of agricultural heritage systems based on the GIAHS project and the support from Ministry of Agriculture, Chinese Academy of Sciences and other institutions.

Some Experiences

Government Support and Policy Perfection are the

Strong Guarantee for GIAHS Conservation

In recent years, some policies liking eco-agriculture development, agricultural eco-environmental protection, well-off society building, harmony society building, and especially the new socialism countryside building provide important opportunity and strong support for GIAHS conservation.

For example, after listed as one of the first pilot sites of GIAHS conservation, Longxian was listed as the experiment site of New Socialism Countryside Building. And, Fangshan Township is applying to the Environment-friendly Township site. These combination will help to the village can obtain more support from local governments.

Multiple Participation is the base for Co-burdening Responsibility and Sharing Benefits of GIAHS Conservation

GIAHS conservation relates to different stakeholders including at least local farmers, enterprisers, scientists, governors. Multiple participation will play a very important role for the successful conservation. Based on the investigation and interviewing with different stakeholders, responsibilities, tasks and benefits of

different stakeholders from the GIAHS conservation can be determined.

Traditional Cultural Passing-and-Following Plays Essential Role for Long-term Conservation of GIAHS

A GIAHS is the synthetic system consisting of natural ecological conditions, agronomic techniques, economic growth, social progress, and cultural passing and following. Many experiences and lessons demonstrate that culture conservation is the key aspect of the GIAHS evolution and conservation. The same situation exists in the rice-fish agriculture in Qingtian. The traditional culture forms related rice-fish system include the typical diet culture (dried sliced fish, field fish dishes), folk arts (song, dance and stone carving), folk habitude, proverbs, hymeneal cultures, traditional farm tools, and so on.

Scientific Research and Technical Popularization Infuse New Vitality of Traditional Agricultural Practices

Differing from other kinds of cultural heritage, a GIAHS must evolution with social and economic development. Therefore, scientific research and technical popularization will be helpful to the evaluation of GIAHS and its demonstration to other regions and adaptation to natural change. As to Qingtian's rice-fish agriculture, some scientists are making the researches about the reciprocity mechanism between rice and fish, social and economic influences on the system, interactions between natural conditions and cultural elements, and development of the traditional system in modern times For example, in the rice-fish system, rice and fish species have been developing, the density and timeliness of rice planting and fish breeding are more rational, and in many regions similar models have been developed liking rice-duck system, rice-crab system, and rice-duckweed-fish.

Realization of Multi-values of GIAHS and Relevant Industrial Development Provide Economic Base for GIAHS Conservation

Multi-values exist in the traditional agricultural systems. For example, a rice-fish system could provide economic values (safe rice and fish products), social values (labour occupation), ecological (rich biodiversity, good field environment), and cultural values (amusement) for human. The relative industrial development would promote the realization of these potential values and be helpful to the conservation.Longxian village is the typical one. There are five kinds of tourism resources: rice-fish system for research and education, field fish dishes, the surrounding landscape, old mountain village, and typical folk-custom culture. In 1999, the village was granted as the name of "China's Field-fish Village" which attracts adjacent tourists to degustation and visit. The fact that Longxian village was chosen as one of the first GIAHS sites stimulates the village tourism development. According to our investigation in early October of 2005 and 2006 separately, the tourists is increased by a specified number of times. Some local farmers obtain much more income than before only relying on field production.

Thanks to the traditional production methods and tools, and little use of chemicals and much use of organic fertilizers, the eminent eco-environmental conditions would be the base for the development of organic agriculture. The healthy and safe agricultural products could make the local farmers get more income.

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