

## BOOK REVIEW

### *Aquatic Ecology of Rice Fields (2005)*

Editors: **C.H. Fernando, F. Goltenboth and J. Margraf**

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The book contains an excellent collection of fifteen original papers on the agro-ecology of rice fields. It is the first comprehensive book on the topic, and provides a focus on the aquatic phase and especially on aquaculture where limnology is given prominence. The agronomy of rice cultivation and the interactions of the aquatic, semi-aquatic and the interactions of the aquatic, semi-aquatic and terrestrial phases are analyzed in various chapters. Most chapters have been dealt with in an integrated and multidimensional manner. The first article deals with the genesis from marshes to rice fields, and takes readers through the evolution of rice cultivation. The introduction of monoculture methods has caused the elimination of useful wetland species. The traditional methods of rice cultivation promote rice fields as refuge for wetland species (fish) and provide free protein to farmers. Two chapters discuss the Ifugao rice terraces of the Philippines, which are believed to operate in a sustainable system. The microbiology of rice fields and the inter-actions of the benthic fauna, bacteria and soil chemistry and their roles in fertility and weed control are discussed. The practice of rice-fish cultivation had its origins at least two millennia ago in China and India. It then spread to Italy, Japan and the Russia. Fish production declined in rice fields with the massive use of fertilizers, pesticides and mechanization. Recently, there has been a resurgence of rice-fish culture partly due to sustainable forms of rice cultivation and technological advances in fish culture.

Rice-fields as a recycling system is the subject of discussion by Yasushi and Kikuchi. The role of tubificids and mud-snails is elucidated, the former apparently reduces and eliminates weeds, while the latter are a source of human food in rural Japan. Chapman and Sollows discuss the practice of fish culture in rice fields in China and Peninsular Malaysia. Fish yields exceeding 400 kg/ha have been recorded during the 1940s.

The impacts of biocides on the rice field ecosystem and especially the effects on the fauna have been discussed. Integrated pest management has meant that there is an improved environment for fish farming in irrigation channels and small reservoirs. Fishes reduce pests of rice plants, both terrestrial and aquatic. Vectors of malaria and schistosomiasis are adversely reduced by the presence of both indigenous and cultured fishes. The cultivation of rice has often led to great increases of vectors transmitting diseases to humans and domesticated animals. These issues and the control of mosquitoes are the subject of two papers. The book is an important reference to tropical ecologists, agriculture officers, vector control officers, entomologists and fish biologists. It provides an up to date review of the science of rice field ecology, as the coverage is wide and comprehensive. The senior editor Prof. C.H. Fernando, a frequent visitor to Southeast Asia, should be congratulated for his concerted effort in producing the book.

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