

Elsa Amilhat (2006) *Fisheries Ecology of rice Farming Landscapes: Self-recruiting Species in Farmer Managed Aquatic Systems*. PhD thesis, University of London, London, UK.

Abstract

Rice agro-ecosystems support productive fisheries that provide an important source of local food, income and employment. The thesis investigates the ecology and management of wild aquatic animals (self-recruiting species, SRS) within farmer managed aquatic systems (FMAS) such as rice fields and associated trap ponds. Extensive field surveys in Thailand, Cambodia and Vietnam were carried out to characterize the diversity of farmer-managed aquatic systems and evaluate the effectiveness of various management practices in raising fisheries production. A detailed ecological field and modelling study has been carried out on a key fish species managed by farmers, the snakehead *Channa striata*.

SRS from FMAS contributed significantly to aquatic resource production in all study areas, and their contribution was particularly important in Thailand and lowland Cambodia where it represented more than half of the total household catch (65-114kg/household/year). The contribution in upland Cambodia and Vietnam was lower (3-20kg/household/year) but still represented 22% of the overall catch. There were notable differences among study sites in terms of FMAS characteristics. Certain indigenous management measures such as brush parks and manuring were effective, approximately doubling SRS abundance. Three fish species (*Channa striata*, *Clarias brachatus* and *Anabas testudineus*) contributed more than 40% of the total catch by weight in Cambodia and Thailand. However, other groups such as crustaceans, molluscs, and amphibians represented were also important.

The population dynamics of *Channa striata* within a rice farming landscape was investigated through a mark-recapture experiment. A dynamics model was developed, with parameters estimated from the mark-recapture data. The model was used to investigate the impact of alternative management strategies. The results suggest that the snakehead production could be enhanced by broodstock preservation, conservation zones and increased fishing effort during a particular period. Abandonment or intensification of rainfed rice farming would have significant negative impacts on the snakehead fishery.