
***Fisheries Dynamics of Modified
Floodplains in Southern Asia***

***Sub-Project 2: Density Dependence of
Fish Natural Mortality Rates***

Project R5953

Fisheries Management Science Programme
managed by *MRAG*, under the ODA
Renewable Natural Resources Research Strategy

MRAG Ltd, March 1997

ODA FMSP Project R5953
Fisheries Dynamics of Modified Floodplains in Southern Asia
Sub-Project 2: Density-dependence of fish natural mortality rates

Contents

1. Background
2. Sub-project objective
3. Personnel
4. Research activities and programme
5. Description of outputs

PhD Section Density dependent natural mortality of *Puntius sophore*

1. Background

The ODA Fisheries Management Science Programme's project R5953: Fisheries Dynamics in Modified Floodplains in Southern Asia is a three year comparative investigation of a hydrologically modified river floodplain in Bangladesh and a more pristine one in Indonesia. The project was designed to address two key developmental needs:

1. *To understand the implications of migration, reproduction and dry-season survival strategies of river fish on the management of inland capture fisheries.*
2. *To understand the impacts of flood control measures on the fish production potential of modified floodplains, and make recommendations on the wider management of floodplain resources for fish production.*

This sub-project investigated the density dependence of *natural* mortality rates in dry season waterbodies, with restrictions on fishing activities. The results were used to (1) develop a mortality sub-model for assessing the impact of flood regimes on fish production rates, and (2) determine the potential dry season survival rates of fish in waterbodies set aside as reserves (for comparison with sub-project 1).

2. Sub-project objective

To examine the influence of population density on the natural mortality rate of *P.sophore* to provide a more realistic model for exploring the dynamics of floodplain fish populations.

3. Personnel

The sub-project was mainly undertaken by the following staff of the Marine Resources Assessment Group Ltd (MRAG), 8 Prince's Gardens, London, SW7 1NA, UK:

Mr A.S.Halls, PhD research assistant

Mr Kanailal Debnath, Bangladesh team leader

4. Research activities and programme

As described in the following PhD chapter section, the survival rates of populations of *Puntius sophore* were studied in discrete natural dry season water bodies, located inside and outside the FCDI scheme at the project site, for the four month dry season period December 1995-March 1996. The study was undertaken in both *kua* fish pits and *mathel* household ponds. Though the main analysis was based on the abundant key species *P. sophore*, the effects of biological interactions (particularly predation) on the observed mortality rates were also considered.

Additional material on mortality rates was also obtained during Sub-Project 4 on Density Dependent Growth Rates (Appendix F), undertaken in collaboration with BAU, Mymensingh. That information is also reported in this report.

5. Description of outputs

This sub-project was written up as part of the PhD study, as shown in the attached section entitled 'Density-dependent natural mortality of *P.sophore*'.