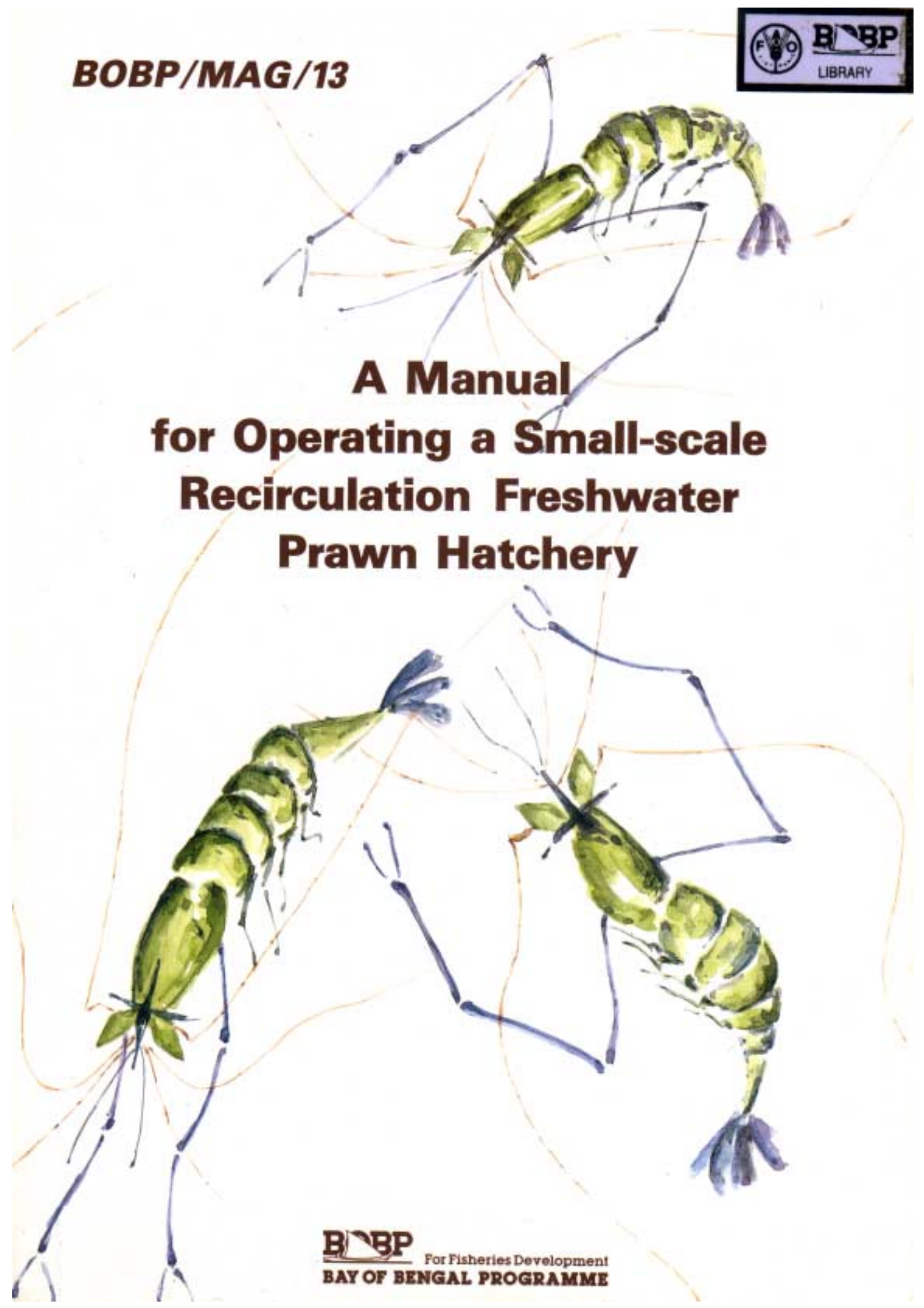


**BOBP/MAG/13**

A watercolor illustration of three prawns, one at the top and two at the bottom, rendered in shades of green, blue, and purple, set against a background of thin, wavy lines.

**A Manual  
for Operating a Small-scale  
Recirculation Freshwater  
Prawn Hatchery**

# A Manual for Operating a Small-scale Recirculation Freshwater Prawn Hatchery

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This manual, based on the experience of the Bay of Bengal Programme (BOBP) project in Potiya, near Chittagong, Bangladesh, is written for those interested in establishing a small-scale inland freshwater prawn hatchery using the clear water method. It is assumed that the reader has some basic knowledge of aquatic biology, but is not necessarily a degree holder in the subject. The method described is based on the use of brine obtained from salt pans. The brine is diluted with well or surface water to make up the rearing water. Such technology is widely used in commercial hatcheries in Thailand. As a filter is not always available, a simple biofilter, for recirculation of the water, is incorporated in the tank design. The biofilter greatly reduces, or eliminates, the need for water changes during the rearing cycle. The hatchery system described consists of larvae rearing tanks, mixing and brine storage tanks, *Artemia* incubators and supporting mechanical equipment.

Recirculation systems are becoming increasingly popular and have now been shown to give consistent production of quality post-larvae. All the necessary details for setting up such a simple system are included in this manual, which is also profusely illustrated to make what is described in the text clearer.

The Bay of Bengal Programme (BOBP) is a multiagency regional fisheries programme which covers seven countries around the Bay of Bengal – Bangladesh, India, Indonesia, Malaysia, Maldives, Sri Lanka and Thailand. The Programme plays a catalytic and consultative role : it develops, demonstrates and promotes new techniques, technologies, methodologies and ideas to help improve the conditions of small-scale fisherfolk communities in member countries. The BOBP is sponsored by the governments of Denmark, Sweden and the United Kingdom, and also by UNDP (United Nations Development Programme) and AGFUND (Arab Gulf Fund for United Nations Development Organizations). The main executing agency is the FAO (Food and Agriculture Organization of the United Nations).

This manual has not been cleared by the Government concerned or the FAO.

**July 1993**

## A CLARIFICATION

**BOBP/MAG/13 – A Manual for Operating a Small-scale Recirculation Freshwater Prawn Hatchery** was written at the time the only literature available to us indicated the orange claw variety could possibly be a subspecies. Subsequently, we have come to know that both this species and the ‘small’ variety are actually subdominant forms which change to dominant forms when the large blue claw ‘bulls’ are removed from the culture pond. In this context, the section ‘Subspecies of *Macrobrachium Rosenbergii*’ on page 2 may be substituted as follows:

### Morphotypes of *Macrobrachium rosenbergii*

Dominance patterns among males in a population of freshwater prawns leads to the appearance of three morphotypes, blue claw, orange claw and clear claw (Griessinger, *etal.*, 1991).

In a pond culture of *M. rosenbergii*, 50 per cent of the males will be clear claw morphotypes and are the smallest animals in the population. The subdominant orange claw morphotypes make up 40 per cent of the males and are of intermediate size. The dominant, or blue claw morphotypes, form 10 per cent and are the largest animals in the population.

The appearance of these morphotypes is related to the culture conditions. The dominance of a few males, the blue claws, retards the growth of subdominant morphotypes. If the dominant males are removed, some of the subdominant morphotypes shift to dominant blue claws.

Females are more or less homogeneous for a given cohort and do not exhibit morphological variations due to social structure, as do the males.

\*GRIESSINGER J.K., LACROIX, D. and GONDOUIN, p. (1991). *L'élevage de la crevette tropicale d'eau douce..* Institute francais de recherche pour l'exploitation de la mer.. 372 pp.

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# Introduction

According to FAO nomenclature, freshwater paleomonids are referred to as 'prawn'; marine penaeids, metapenaeids and paleomonids are called 'shrimp'.

The giant freshwater prawn, *Macrobrachium rosenbergii*, grows to a large size in the Indo-Pacific region and is a popular aquatic food both within the region and in Europe and North America. In the early Fifties, Thai farmers started rearing freshwater prawn by collecting seed from natural waters. *M. rosenbergii* grows fast, can tolerate moderate temperature and salinity changes and can be cultured in ponds. However, due to dependence on nature for seed, production was very low.

The primary condition for intensification of any culture depends on the availability of seed. Based on the interest shown by farmers in the culture of *M. rosenbergii* in Southeast Asia, a hatchery industry has developed.

In 1961, a Taiwanese scientist, Dr. S. W. Ling, while working at the Fisheries Research Institute in Malaysia, discovered that *M. rosenbergii*, though actually an inhabitant of freshwater, completed its larvae phase in brackishwater. In nature, *M. rosenbergii* spawns in estuaries. After spending the first month or so of their lives in these waters, the juveniles start their journey upstream.

Following this discovery, Dr. Ling reared the larvae in brackishwater and achieved success in 1962. In 1963 he produced enough prawn fry to stock culture ponds. From then on, prawn culture became popular in Malaysia. The success of Dr. Ling aroused interest all over the world. In the succeeding ten years, extensive research ensued. In 1965, research on seed production and culture of *M. rosenbergii* started in Hawaii under the leadership of T. Fujimura. The 'green water' method of seed production developed through his research.

In the intervening years, many advances have been made in hatchery technology. The green water method is no longer used, having been supplemented by the clear water technique. Recirculation systems are increasingly popular and have now been shown to give consistent production of quality post-larvae.

This manual is written for those interested in establishing a small-scale inland freshwater prawn hatchery using the clear water method. It is assumed that the reader has some basic knowledge of aquatic biology, but is not necessarily a degree holder in the subject. The method described is based on the use of brine obtained from salt pans. The brine is diluted with well or surface water to make up the rearing water. Such technology is widely used in commercial hatcheries in Thailand. As brine is not always available, a simple biofilter, for recirculation of the water, is incorporated in the tank design. The biofilter greatly reduces, or eliminates, the need for water changes during the rearing cycle. The hatchery system described consists of larvae rearing tanks, mixing and brine storage tanks, *Artemia* incubators and supporting mechanical equipment.