Small-scale freshwater fish farming

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Foreword

This Agrodok aims at providing basic information on how to set up a small-scale fish farm for subsistence purposes.

As fish farming practices are very diverse, we have chosen to limit ourselves to small-scale freshwater fish farming in the tropics. And, as pond fish farming is the most common form of fish cultivation in these areas, the information provided focuses on pond construction and pond management.

The first part of this Agrodok (Chapters 1 to 4) describes the principles of fish farming, types of fish farms, methods of fish farming, and pond maintenance and monitoring. Also included is a section on periphyton-based fish farming, a new and promising technology. The second part of the book gives basic guidelines for setting up a fish farm and covers the selection of a proper site, of farm type and of fish species to be cultured. Fish nutrition, health, reproduction, harvesting and post-harvesting aspects are briefly discussed.

Agromisa welcomes your comments on the contents of this book, or additional information in order to improve future editions.

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Part I: Fish farming: basic principles

Figure 1: Advantages of fish farming
1 Introduction

Throughout the centuries fish has been an important component of the population’s diet in many parts of the world. Fish catches increased rapidly over the past hundred years due to improved technology, which provided more powerful engines and sonar equipment. This led to over fishing and caused a worldwide decrease in wild stocks. As a result, the growth in fish catches stopped some 20 years ago. The need to increase fish production by farming became therefore an urgent matter.

The term ‘aquaculture’ covers all forms of cultivation of aquatic animals and plants in fresh-, brackish- and saltwater. Aquaculture has the same objective as agriculture, namely, to increase the production of food above the level that would be produced naturally. Today, aquaculture is responsible for an ever-increasing share of global aquatic food production, which has increased from 3.9 percent in 1970 to 31.9 percent in 2003 (FAO, 2005).

This book focuses on the small-scale cultivation of mainly freshwater fish species. As in agriculture, fish farming techniques include:

- Removal of unwanted plants and animals
- Replacement by desirable species of fish
- Improvement of these species by crossbreeding and selection
- Increase of nutrient availability by the use of fertilisers and feeds

Fish farming can be combined with agriculture, animal husbandry and irrigation practices, which can lead to better utilisation of local resources and ultimately to higher production and net profits. This practice is called ‘integrated fish farming’ and the subject is extensively dealt with in Agrodok No. 21.

The most important advantages of fish farming are summarised below and depicted in figure 1.
Advantages of fish farming

- Fish provides high quality animal protein for human consumption.
- A farmer can often integrate fish farming into the existing farm to create additional income and improve its water management.
- Fish growth in ponds can be controlled: the farmers themselves select the fish species they wish to raise.
- The fish produced in a pond are the owner’s property; they are secure and can be harvested at will. Fish in wild waters are free for all and make an individual share in the common catch uncertain.
- Fish in a pond are usually close at hand.
- Effective land use: effective use of marginal land e.g. land that is too poor, or too costly to drain for agriculture can be profitably devoted to fish farming provided that it is suitably prepared.