



INTENSIVE & HYGIENIC *Moina sp.* CULTIVATION MANUAL

FISHERIES RESEARCH INSTITUTE



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FOREWORD

Assalamualaikum w.b.t.

In the Name of Allah, the Most Merciful and Compassionate. Praise and gratitude I extend to the presence of Allah SWT because by His Grace, Mercy, and Blessings, the Intensive and Hygienic *Moina* sp. Cultivation Manual in English Edition successfully produced this year.

The advancement of the aquaculture sector remains a priority in enhancing national fisheries production. However, significant challenges persist in achieving the 60:40 aquaculture production policy by 2030, which targets a total output of 958,000 MT metric tons of fish through aquaculture. A crucial aspect of this goal is the production of high-quality seeds, particularly through hatchery operations, to reduce reliance on imported seeds and meet current and future targets. The availability of early-stage diets, such as live feed for cultivating fish and shrimp seeds, is of paramount importance. In Malaysia, there is currently no established commercial live feed production industry. Consequently, there is a continued reliance on increasingly expensive and unsustainable traditional live feed sources, such as *Artemia* spp. Alternatively, there is a growing demand for live feed like *Moina* sp. among nursery operators and entrepreneurs in the ornamental fish industry, with some even resorting to obtaining *Moina* sp. from unsanitary wild sources and posing a huge risk to the quality of seeds produced.

Therefore, this manual is highly relevant in producing sufficient and quality fish and shrimp seeds for the requirement of the country's aquaculture industry. Since its first publication in 2019 (Bahasa Melayu version), the culture techniques have been successfully disseminated to various stakeholders such as government and private hatcheries. To date, over twenty hatchery operators are actively producing *Moina* as a live feed source for freshwater fish at the nursery stage. This manual is also the result of findings from research conducted under the 11th Malaysia Plan and received development allocation under the Aquaculture Research & Development and Pre-Commercialization Research Product (22501 037).

The English version of this manual will help it reach a wider audience and benefit the aquaculture industry even more. This will contribute to the growth and establishment of the live feed industry in our country, which is expected to see increase demand from fish seed nursery operators and ornamental fish breeders in the coming years. We believe that making this manual available in English will further support our national food security efforts. Lastly, I would like to express my gratitude to the authors and all individuals, directly or indirectly, involved in the successful publication of this manual.

Thank you.

DR. AZHAR HAMZAH

SENIOR DIRECTOR OF RESEARCH
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PREFACE

Assalamualaikum w.b.t.

Alhamdulillah, all praise is due to Allah, with His permission this manual in English edition can be published. Salutations and peace be upon the great Prophet Muhammad SAW. This manual is the result of research conducted under the Eleventh Malaysia Plan (RMK-11) under the Aquaculture Research and Pre-Commercialization Research Project (22501037). For the information of the readers, the *Moina* sp. produced intensively and hygienically as described in this manual by FRI Glami Lemi has successfully contributed to the production of various high-quality fish seeds such as Malaysian Mahseer, Catfish, *Jade Perch*, ornamental fish including *Betta* sp., guppies, and other species. Moreover, it directly reduces the cost of fish seed production by replacing more than 90 percent of the use of traditional live feed imports, namely *Artemia* spp. In addition, this manual also explains the importance of producing hygienic live feed in sufficient quantities for the production of high quality fish seeds. Hopefully, the knowledge shared in this manual, which is also supported by visual e-reference innovations through *Moina Information via Video for Education* (MIVE) using QR codes, easily to understand and beneficial to the target groups.

At this juncture, we would like to express our gratitude to the Senior Research Director, Dr. Azhar bin Hamzah, Director of FRI Glami Lemi, Dr. Siti Norita binti Mohamad, Head of the Fish Nutrition Program at FRI, En. Muhammad Suhaimee bin Abdul Manaf, and Director of InProkom, Dr. Wan Norhana binti Md Noordin for their guidance and support in writing this manual. Furthermore, we would also like to extend our heartfelt thanks to En. Zafrel bin Zainal Abidin (contract staff of FRI Glami Lemi), Dr. Shaharah binti Mohd Idris (FRI Tanjung Demong), En. Teoh Pik Neng (FRI Pulau Sayak), Cik Nur Hidayah binti Asgnari (FRI Kampung Acheh), and Dr. Mohd Fariduddin bin Othman (former Director of FRI Glami Lemi), for their commitment and support in the success of the related research leading to the production of this manual. We also thank all the staff of FRI Glami Lemi, especially the Fish Breeding Unit and the farmers who are directly and indirectly involved in supporting the implementation of this project.

Wasalam.

Hanan bin Mohd Yusof, Amatul Samahah binti Md. Ali, Tazri Amil bin Shafie, Aznaliza binti Yahya, Norlizah binti Abdullah, Ahmad Azizi bin Idrus.

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