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# Intensive Fish Farming

EDITORS: C.Jonathan Shepherd and Niall Bromage

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Review note by

K.Vijayakumaran, Scientist,

Research Centre of the Central Marine Fisheries Research Institute,  
Visakhapatnam, IN DIA.

The book 'Intensive Fish Farming', edited by C.Jonathan Shepherd and Niall Bromage, gives an up-to-date global survey of the state of art of intensive fish culture which has evolved from low productive extensive systems to intensive systems involving advanced technology of production and management. The subject matter is discussed against the technoeconomic background with special reference to the Salmonids, which offer a useful model with exacting requirements covering both fresh water and sea water farming.

The book is divided into ten chapters. In the first chapter Dr.Shepherd narrates the history of fish farming in brief before dwelling on the global statistics, efficiency, economic development and intensification of finfish farming.

The subsequent two chapters deal with the biological aspects and environmental requirements, different farming systems and husbandry practices. The topics on fish biology, from the aquaculture perspective, is meant for those who lack prior exposure to the subject. The interrelation between tempera-

ture, water quality, flow rate, dissolved oxygen and growth cycles are discussed under 'site evaluation'. The chapter on farming systems and husbandry practices take the reader through hatchery production, on-growing, and husbandry practices with regard to cleaning and maintenance, feeding, grading and harvesting, transportation, effluent treatment and management.

The topic contributed by Dr.John Roberts gives in a nut-shell the method of recycling of water where water supply is the limiting factor, and discusses the related cost factors for optimisation of systems of technical and commercial viability.

The chapters four, five and six are the most informative and the best written ones. The fourth chapter by Dr.Bromage describes the recent advances in selection and techniques of induced breeding by different hormones, many of them, by virtue of their consistent potency and ready availability, a better substitute for carp pituitary extract. Environmental control of spawning, cryopreservation of egg and sperm, sex control like feminisation, masculinisation, sterilisation

by hormone and triploidy, hybridisation, gynogenesis etc. are discussed.

The importance of fish nutrition in intensive fish farming has been well explained in the chapter on nutrition by Prof.Takeshi Watanabe. This makes the book singular among the contemporary works on aquaculture. Individual constituents like proteins, lipids, carbohydrates, minerals and vitamins are dealt with in detail with reference to their requirements for various stages of growth. The different efficiency ratios like NRE, PER, BV, NPU, etc. are briefly discussed.

The sixth chapter by Dr.Shepherd provides an account of various health problems encountered world over in finfish culture. Special attention is paid to the clinical aspects of the diseases originating from genetic, nutritional, water quality and pathogens. Suitable remedial actions for prevention and treatment have also been dealt with.

Intensive mariculture in Japan with respect to major species of finfishes like yellowtail, sea bream, Japanese flounder, ouffer



fish etc. is an interesting topic covered in the seventh chapter by Prof. Takeshi Watanaabe. The successful combination of sea ranching and mariculture of important finfishes, promoted by the National fish farming centres and Prefectural fish farming centres, is worth emulating in other countries for sustaining both capture and culture fisheries.

The eighth chapter by Dr. Parker gives an account of the culture practice of catfish, salmonids, sea bass etc. in U.S.A. and discusses the vertical integration of the industry in the past 2 to 3 decades. This chapter has all the dryness of an official report.

The unique achievement of Israel in the field of intensive aquaculture is unrivalled in the ninth chapter, in which Shmuel Sarig discusses monoculture, polyculture, and intensive and integrated systems of culture developed in Israel. The persistent effort to achieve economic optimisation has resulted in a semi-intensive system with significant reduction in the total area under aquaculture and increase in average output, thus stabilising the total output.

The concluding chapter by the editors explores the problems and prospects of commercial development in intensive fish farming. The demand and supply factors are critically analysed along with the criteria and sequence of decisions involved in investment. An economic case study of Salmon farming is appended to this chapter. The areas of ignorance with regard to the constraints on market, technical and organisational development are clearly shown.

A chapter-wise reference at the end, a well compiled

glossary of terms used; a set of conversion tables, a comprehensive subject index etc. add to the utility of the book.

One point about the book is that there is a major lacuna in not devoting a chapter on finfish farming in South-East Asian countries.

The book is an impressive contribution to the growing literature on aquaculture. It will be a valuable asset for the departments, Universities, Institutions and individuals engaged in research, planning and development in the field of fish farming. The utility will be even more to the entrepreneurs who wish to venture into intensive aquaculture.



#### REPORT OF TASK FORCE ON FISHERIES

A task force consisting of the Union Minister of State for Finance, Mr. Eduardo Faleiro and other top officials like the Chief General Manager, State Bank of India, Bombay and officials of Marine Products Export Development Authority, National Institute of Oceanography, Reserve Bank of India, NABARD and General Insurance Company which was set up by the Union Government to study the problems of marine fisheries in India, is reported to have suggested the setting up of Brackishwater Fisheries Development Agencies in the various maritime states. This task force is also stated to have recommended the setting up of co-operative fish marketing structure at the national level.

The report urged the nationalised banks to provide working capital to the needy fishermen, apart from term loans on the usual conditions of RBI applicable to agricultural advances.

The task force has also defined the marginal fishermen as traditional fishermen having only nets and operating in inshore waters. Small fishermen have been defined as those having nets, canoes with or without outboard engines.

The task force suggested that the interest on fishery loans which became overdue due to natural calamities should not be compounded. The total recoveries should not exceed 200% of the loans granted to small and marginal fishermen. It also recommended that working capital not exceeding Rs.3,000 for the fishing boats with outboard engines and Rs.15,000 to boats with trawling facilities and Rs.25,000 to boats with trawling and purse-seining facilities should be granted by the commercial banks.

The recommendations of the working group were that both the Central and State Governments should examine the need for infra-structural facilities on an area basis. These should cover fishing harbours, jetties, establishment of fish meal plants for proper utilisation of trash fish and establishment of ice plants and cold store chains. It was also necessary to provide telephone facilities and weigh bridges on rental basis at fishing harbours. Facility for storm signals should also be provided.

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#### FISHING DISPUTE AT NEPAL BORDER

Nine persons, including three women, were injured in a clash between the villages of Bhalai Itaruwa (Bihar) and Tarahi (Nepal) over fishing rights in the border river flowing between their villages, according to the Nepal police.

