

Handbook on Fisheries and Aquaculture Technology

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The fishery sector is important from Indian economy view point as it contributes a source of income to a number of fishermen and has huge export potential. The systems and technology used in aquaculture has developed rapidly in the last fifty years. They vary from very simple facilities like family ponds for domestic consumption in tropical countries to high technology systems like intensive closed systems for export production. Much of the technology used in aquaculture is relatively simple, often based on small modifications that improve the growth and survival rates of the target species. Nowadays, the fish and fisheries industry is one of the fastest growing international commodity markets globally. Guaranteeing an adequate supply to this international market requires hundreds of thousands of fishing vessels and fish farms, as well as tens of thousands of fish processing workers, wholesalers and retailers in countries spread all over the world. The fishery sector thus generates employment and income for millions of people and in one of the major fields to venture. A wide range of aspects of fresh water aquaculture such as selection of species of fish and shellfish, construction and preparation of various types of fish ponds, control of aquatic weeds and predators, production of seed fish and their transportation, fish nutrition and fish diseases and their control pertaining to composite fish culture, air breathing fish culture etc. have been dealt with a length for easy adoption.

The major contents of the book are classification of fishes, general characters of fishes, techniques in fish identification, cold water fisheries of India, physical and chemical properties of fishery water, chemical constituents of fish, economic importance of fishes, fish in relation to human health, construction of fish farms, etc.

In this book you can find all the basic information required on the fundamental aspects of the fisheries and aquaculture technology with detailed information of their applications a wide variety of industrial processes etc. The book is very useful for research scholars, technocrats, institutional libraries and entrepreneurs who want to enter into the field of aquaculture technology.

1. Fish, Fisheries and Ichthyology

Fish

Fisheries

History of Ichthyology

2. Classification of Fishes

General Characters of Fishes

Major Groups of Living Fishes

Characterization of Living Fish Groups

Class Agnatha (Lampreys and Hagfishes)
Subclass Cyclostomata
Class Chondrichthycs (Sharks, Rays, Skates,
and Chimaeras).
Subclass Elasmobranchii (Sharks, Rays, Skates)
Subclass Holocephali (Chimaeras).
Class Osteichthyes (Bony Fishes)
Subclass Sarcopterygii (Lungfishes and Lobefins)
Subclass Actinopterygii (Higher Bony Fishes)
Major groups of Extinct Fishes
Class Cephalaspides (Osteostraci)
Class Pteraspides (Heterostraci)
Class Palaeospondyli (Cycliaae)
Class Pterichthyes (Antiarchi)
Class Coccosteii (Arthrodira)
Class Acanthodii

Teleostei

Division I. TAENIOPEDIA (Ribbon young)

Division II. ARCHAEOPHYLLACES

(Ancient watchmen)

Division III. EUTELEOSTEI (Intensive Teleostei)

3. Fish Identification

Techniques in fish identification

Morphometric characters

Meristic characters

Descriptive characters

Key to the Identification of Fishes

Fisheries of India

5. Cold Water Fisheries of India

Trout

Mirror carp

The Tench (*Tinca tinca*)

Golden carp (*Carassius carassius*)

Mahseer

Barilius

Labeo

Garra

Glyptothorax pectinopterus

Programme of Fisheries

Development of fish in the Hills of

Uttar Pradesh

Composite culture

New Directions

6. Crustacean Fisheries

Crab Fishery

Lobster Fishery

7. Molluscan Fisheries

Shell-fish Fishery

Chank Fisheries

Pearl Fisheries

8. Physico-Chemical and Biological Conditions of Fishery Water 48-58

Physical and chemical properties

Organisms in fishery water

9. Paddy Cum Fish Culture

Requisites of a paddy field for fish culture

Some of the fishes used in India for fish culture in paddy field's are

10. By-Products of Fishing Industry

Fish Oils

Preparation of body oils of fish

Composition of fish oil

Fish Oil Industry in India

Extraction of liver oil

Liver-oil industry in India

Shark fins

Isinglass (fish-maws)

11. Chemical Constituents of Fish

Flesh of Fishes contains

Mineral constituents

Carbohydrates

Enzymes

Pigments

Vitamins

Phospholipids

12. Economic Importance of Fishes

By-products of fishes

Oils

Fish Protein

Fish-meal

Fish glue

Ising glass

Other uses

Shark fins

Fertilizers

Controllers of diseases

Scavengers

As baits

An object of sports and entertainment

Aquarium

13. Fish in Relation to Human Health

Fish in Relation to Human Health

14. Fish Aquarium

TANK Selection

Selection of Plants

Selection of Fish

Maintenance of Aquarium

15. The Diversity of Fishes

Adaptations in fishes

16. Hill Stream Fishes

Changes in external form and size of fish

Scale covering etc.

Paired fins (skeleton and musculature connected with them)

Caudal fin and its peduncle

Mouth, jaws and barbels

Eyes

Gill opening etc.

Air-Bladder

Skin and other modifications

Examples of Indian hill stream fishes

Cyprinoids

Siluroids

17. Plankton and Fish Productivity

Basis of production :

Special adaptations of animals

planktonic life :

The relationship of zooplanktons to the environment:

18. Zooplankton

Protozoa

Porifera

Coelenterata

Ctenophora

Nemertinea

Nematoda

Rotifera

Polyzoa

Chaetognatha

Annelida

Mollusca

Crustacea

Echinodermata

Protochordates

Fishes

Amphibians

Characteristic features of zooplankton

as stated before are

Special adaptations of animals to

planktonic existence

19. Transportation and Marketing

Transport

Ice and Cold Storage

Marketing

Fishing Crafts and Gears

Fishing Vessels

Sea Crafts

West Coast

East Coast

River Crafts

Rafts and dug-outs

Plank-built boats

Large fishing boats

Fishing Gears (Nets)

Inland Fishing Gear

Gear used in estuaries, lagoons and back waters

Gear used in ponds, jheels, lakes and reservoirs

Gear used in hill streams

Gear used in rivers

20. Processing and Preserving

Cleaning, Boning and Filleting Fish

Cleaning

Boning Round Fish

Skinning and Boning Flat Fish

Preparing Eels

Skinning Dogfish and Tope etc.

Preparing Lobsters and Crabs

Boiling

Extracting the Meat

Shrimps and Prawns

Shelling Shrimps and Prawns

Potted Shrimps

Shrimp Waste

Salting Fish

Roll mops

Dried Fish

Bottled or Canned Fish

Freezing

Smoked Fish

Making the Smoke

Equipment

Preparing the Fish

Brining

Smoking

Smoked Mussels

Smoked Eels

21. Aquaculture - The Concept

Mariculture

Substrate Systems

Seawater Ponds

Cages

Enclosures

Tanks

Aquaculture in Fresh and Brackish Water

Net Cage Husbandry

Dual-Purpose Use of Water and Land

22. Aquaculture - In Practice

Algae and Seaweeds

Algae

Seaweed

Molluscs

Crustaceans

Marine Fish

Fresh and Brackish Warm Water Fish

The Carp (*Cyprinus carpio*)

Herbivorous Cyprinids

Tilapia spp.

Milk Fish (*Chanos chanos*)

Mullet (*Mugil* spp.)

Catfish

EELS (*Anguilla* spp.)

Other Warm Water Fish

Africa

Heterotis niloticus

Nile Perch (*Lates niloticus*)

Haplochromis spp., *Hemichromis* spp.,

Serranochromis spp.

Labeo spp.

Asia

Ayu (*Plecoglossus altivelis*)

Labyrinth Fish

South America

Pirarucu (*Arapaima gigas*)

Fish in Colder Waters

Trout

Salmon

23. Culturable Fish and Shellfish

Culturable fishes

Indian Major Carps

Exotic (Chinese) Carps

Minor Carps

Catfishes (Order : Siluriformes)

Murrels or Snakeheads

(Order : Channiformes)

Tilapia (Order : Perciformes)

Sport fishes (Cold-water fishes)

Trouts (Order : Salmoniformes)

Salmo trutta fario (Brown trout)

Salmo gairdneri gairdneri (Rainbow trout)

Mahseers (Order : Cypriniformes)

Culturable Shellfish

24. Construction of Fish Farms

Structures of fish ponds

Bunds

Slope

Berm

Construction of pond

Determination of Quantity of Earth for the

Construction of Bund

Bund Formation

Inlet and Outlet

Simple inlet and outlet (monk) made of concrete
and bricks

Types of fish ponds

Nursery Pond

Rearing Pond

Production Pond

Other measures to be considered

during the construction of a fish farm

25. Management of Fish Farms-

Nursery pond

Eradication of Aquatic Weeds and Predators

Liming and Fertilisation

Stocking

Supplementary Feeding

Harvesting of Fry

Rearing pond

Fertilisation

Stocking

Feeding

Harvesting of Fingerlings

Production pond

Liming and Fertilisation

Stocking

Feeding

Harvesting of Fish

General Considerations

26. Induced Breeding and Seedfish Production in Carps

Induced breeding in Indian major carps

Collection of Pituitary Glands

Acetone-Drying of Pituitary Glands

Preparation of Pituitary Extract

Selection of Breeders

Injection of Pituitary Extract in Indian Major

Carps

Breeding

Hatching

Induced breeding of Chinese carps

Selection of Breeders

Induced breeding of common carp

Jar Hatchery

27. Transport of Seedfish and Breeders

Techniques of transport

Traditional Method

Transport in Closed Containers

Basis for estimating quantity of seedfish

as a standard

Transport of breeders

28. Composite Fish Culture

Feeding

Production

Economics of composite fish culture

Culture of Air-breathing Fishes

Culturable areas

Collection and rearing of murrel seed

Collection and rearing of catfish seed

Stocking of fingerlings of murrel and catfish

Feeding

Growth and production

Harvesting

29. Culture of Trouts

Characteristic features of trouts

Trout seed resources

Culture practices

Collection of eggs

Incubation of trout eggs

Flat trays and troughs

Incubators
Trout hatching jar
Nursery ponds
Rearing Pond and Raceways
Jar System
Drums
30. Culture of Ornamental Fishes
Setting up an Aquarium tank
Biological filter and aeration
Importance of Biological Filter
Qualities of Water for Aquarium Tank
Filling Water
Planting
Lighting
Varieties of goldfish
Descriptions of common species of ornamental fish
Livebearers
Egg Layers
Introduction of fish in an aquarium tank
Feeding
Breeding of ornamental fish
Egg Scatterers
Breeding Goldfish
Egg Depositors
Bubble-nest Builders
Livebearers
Water quality for breeding tanks
Selection and conditioning of fish for breeding
Nursing the Young
Culture of Giant Fresh-water Prawn, *Macrobrachium rosenbergii*
Characteristic features and distribution of *M. rosenbergii*
Life cycle of *M. rosenbergii*
Collection of seedprawn
Transportation of seedprawn
Management of production ponds
Stocking
Feeding
Growth and Production
31. Fish Farming with Agriculture and Livestock
Fish farming with agriculture
Rice-fish Culture
Simultaneous culture
Simultaneous Culture Of Fresh-water Prawn and Rice
Rotational culture of rice and fish
Fish Culture in 'Pokkali' Fields
Banana-fish Culture
Fish farming with livestock
Duck-fish Culture

Chick-fish Culture
Chick-pig-fish Culture
Cattle-fish Culture
32. Sewage-fed Fish Culture
Quality of sewage
Sewage treatment
Description of oxidation ponds
Sewage-fed fish ponds
Sewage water for other crops
Model plans
Water Recirculation System for Fish Culture
Indoor water recirculation system
Outdoor water recirculation system
33. Culture of Fish Food Organisms
Culture of Diatoms
Sterilisation of glassware
Preparation of medium
Culture in test tubes or Petri dishes
Culture in carboys
Culture in large cylinders
Batch culture
Laboratory culture of zooplankton
Mass culture of zooplankton
Culture of Rotifers and Cladocerans
Culture of Artemia
34. Fish Diseases and Their Control
Medium for fish diseases
Types of diseases
Parasitic Diseases
Treatment
Disorders by Biotic Factors
Disorders by Abiotic Factors
Acidosis and alkalosis
Miscellaneous diseases
Gas Bubble Disease
Dietary Diseases
35. The Development of New
Techniques for Aquaculture
Environment Controlled Warm Water
Aquaculture
Stock Density
TEMPERATURE
Water Quality
Tanks
Feeding
Feed Quality
Feed Quantity
Feeding methods
Mechanical Feeders
Breeding
The Biology of Reproduction
Breeding Technology
Breeding And Multiplication

The Ahrensburg Closed-Cycle System

Construction

Clearing Chamber Volume and Flow Rate

Heating

Materials

Operation

Stock Density

Aeration

Water Pumps

Criteria

Function

Slat Water Modification

Tank 1: *Tilapia aurea* x *Tilapia nilotica*

Tank 2: *Tilapia aurea*

36. Economics of Fish Culture

Production Function

Yield rate and pond area

Input rates

Input-output co-efficients

The interesting input-output co-efficients are :

Input costs

Labour costs

Interest cost

Other costs

Total cost

Relative share of cost component in total cost

Production, Sales and Costs

Income from Fish Farming

37. Analysis of the Economics of Fish

Culture

Pond Size

Yield and input rates

Costs and returns

Farmer's income

Culture Practice

Yield and input rates

Costs and returns

Farmer's income

Water Availability

Yield and input rates

Costs and returns

Farmer's income

Ownership

Yield and input rates

Costs and returns

Farmer's income

Lease Duration

Yield and input rates

Costs and returns

Farmer's income

Government Intervention

Yield and input rates

Costs and returns

Farmer's income

38. Fish as a Food Commodity

Introduction

Biochemical Composition of Raw Fish

Nutritional Value of Raw Fish

Nutritional Value of Preserved and Processed Fish (Fishery Products)

Fish Decomposition

Post-mortem changes and Rigor mortis

Rigor Mortis

Post-rigor decay and spoilage of fish

Enzymatic spoilage

Microbial spoilage

Bacterial flora of fish and bacterial spoilage

Chemical spoilage

Rancidity

Autolysis

Spoilage due to other factors

Spoilage in marine fish

Spoilage of freshwater fish

Fish Preservation

Introduction

Principles of preservation

Methods of preservation

Special problems in fish preservation

Food-poisoning, Intoxications, Allergies etc. from Fish

Food-poisoning from eating a poisonous fish species

Food-poisoning of bacterial origin

Utilization of Fish as Products and

By-products

Fish liver oil

Methods of extraction of fish liver oil from liver

Prototype of fish liver-oil manufacturing plant

Simple model of fish liver-oil extractor for use in small scale cottage industry

Fish body oil

Fish meal

Others

Fish Silage

Fish manure and guano

Fish Sausage and ham

Fish Glue

Isinglass

Fish leather

Fish Caviar

Fish Macaroni

Fish Biscuits

Insulin

Cooking effect on Nutritional value of fish

39. Fish Meal

Making Fish Meal at Home

The Separated Liquids

Fish Oil

Stickwater

The Remaining Solids

What Kind of Fish?

40. Seaweed

Fertilizer

Feed

Food

Carragheen as a Vegetable Gelatine

Soups, Stews and Jams

Some other Carragheen Recipes

Carragheen Blancmange

Carragheen Chocolate Blancmange

Carragheen Jelly

Carragheen Cough Mixture

Sausage Coverings

Laver (*Porphyra umbilicalis*)

Laverbread

Laver Mutton Sauce

Dulse (*Rhodomenia palmata*)

Other uses for Seaweed

41. Fecundity

The individual fecundity is determined

as follows

42. A Fish Farm

The situation of the farm

Water supply

Kind of soil

Embankment

Drainage

Overflow spillway

Fish Farm Implements

43. Aquatic Pollution

Kinds of pollution

Sewage

Industrial waste

Mining waste

Silt from soil erosion

Radioactive pollution

Thermal pollution

How pollutants affect the aquatic organisms?

Detection and measurement of pollution

Chemical tests

Physical tests

Biological tests

Where pollution is found?

Pollution Control

44. Development of Indian Fisheries

Bold programme required

Research work needed

State help essential

Problems of fishery research
Fisheries development in Japan
Commercial fisheries of India
Outside India
How to develop Indian fisheries
Inference
45. Some Traditional Dried
and Smoke Cured Products
Dried Anchoviella
Traditional Drying
Improved Method of Drying
Anchovy Flakes
Laminated Bombay Duck
Brine-pressed Sardines
Salted Boiled Fish (Pindang)
Processing
Pre-process Handling
Production
Processing Conditions and Quality Changes
during Storage
Effect of Salt Content in Brine on Quality
Biochemical Changes during Storage
Microbial Changes
Dehydrated Squid
Raw Material Quality
Drying of Squid
Beche-de-mer
Traditional Processing (Chinese Method)
Improved Method
Southeast Asian Method
Philippine Method
Uses
Maldivian Fish
Masmin
Traditional Process
Improved Method
Dehydrated Jellyfish
Katsuobushi
Seasoned Products (Tsukudani)
46. Products From Whole Fish
Fishmeal
Dry Reduction
Wet Reduction
Fish Protein Concentrate
Methods of Production
FPC Type B
Texturised FPC
Types of FPC and Recommended Standards
Properties of FPC
Nutritive Value and Consumer Acceptability
Economics of FPC Production
47. Surimi
Quality

Raw Materials
Preparation of Mince
Loss and Recovery of Proteins
Types of Surimi
Role of Additives
Sugars
Starch
Polyphosphate and Sodium Chloride
Albumen
Fat
Method of Production
Surimi from Fatty Fish
Properties of Surimi
Future of Surimi
Surimi-based Products
Kamaboko
Fish Sausage
Fish Ham
48. Fermented Fishery Products
Fermentation Processes
Liquid Fermented Products (Sauces)
Factors Controlling Sauce Fermentation
Lipid Content of the Fish and Quality of Sauce
Colour
Flavour
Traditional Methods of Fermentation
Traditional Products
Fish Preserved in Fermented Media
Makassar
Buro
Pekasam
Colombo Curing

Paste Fishery Products
Bagoong (Philippines)
Belacan (Malaysia)
49. By-products
Shark Fin Rays
Fish Maws/isinglass
Pearl Essence
Ambergris
Squalene
Surgical Sutures from Fish Gut Collagen
Hormonal
& Genetic Approach to Fisheries
Introduction
Fish Genetic (Germ Plasm) Resources
Application to Fisheries management
Capture fishery management
Fish Culture Management
Taxonomy
Conclusion
Cryopreservation of Gametes

(Gene Banking)

Cryopreservation technique for sperms :

a flow chart

Thawing for fertilization

Fertilization with cryopreserved sperms

Monosex Culture

Sex Reversal

Sterile Fish

Hybridization

Diploid Hybrid

Triploid (Polyploid) Hybrid

Hybrid Vigour (Favourable Heterosis)

Transgenic Fish

Application

Triploids (Broiler Fish) : Polyploidy

Inbreeding, Cross-breeding and

Selective Breeding

Gold Fish

51. Methods in Fishery Science

Methods of Fish Preservation

Taxonomic Identification

Procedure for identification of new species

for a region or for the literature

Morphometric and other Analysis

of Fish Body

Length of body

Weight of body

Body ratio H/L of fish

Sex Determination

Sexual maturity of the individual

(state of gonads)

Scale reading for age determination

Methods of Measuring Condition of

Fish

Fecundity and Reproduction Analysis

Classification of fishes on the manner of

spawning

Types of eggs :

Estimation of number of eggs

Fecundity or Ovarian egg counts :

Counting of laid eggs :

Immature stage

Mature stage

Co-efficient of maturity

Identification of eggs and larvae

Food and Feeding (Food Habit) Analysis

of Fish

Forage ratio

Qualitative and quantitative Analysis of Stomach

contents

Numerical method

Frequency of occurrence method

Volumetric method

Gravimetric method
Rate of digestion
Direct method
X-ray method
Histological check of stomach wall
Visual check of oral cavity and gill
Food Items
Enzyme activity in digestion (amylase, lipase etc.)
Food Co-efficient
Index of relative importance
Classification of fish based on feeding habits
Pathological Analysis of Fish
Autopsy
Diseases and parasites
Bio-assays of Water
Toxicity analysis of pollutants
Chemical Analysis of water for the natural factors
Dissolved Oxygen [Alsterberg (Azide) method]
Free Carbon dioxide
Determination of ammonia-nitrogen (by Nesslerisation method)
pH
Alkalinity due to Calcium Carbonate : (SBV).
Physical Analysis of water for the natural factors
Use a Tackson turbidimeter
Use of Sacchi disc
American Geological Survey method
Temperature measurement
Plankton Sampling
Sampling procedure :
52. Problems, Prospects and Recommendations
Problems
Fish farmers
Fish Farmer Development Agencies (FFDA)
Lease
Credit
Subsidy
Marketing
Prospects
Area and Production
Employment and income
Recommendations
Data base
Research
Classification of districts
Seed
Over stocking
Lease
Institutional credit
Co-operatives

Fish Farmers Development Agencies (FFDAs)
Significance of Fisheries
FreshWater Culture Fishery
Need for the Study
Objectives

About NIIR

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