



**NATIONAL BANK FOR AGRICULTURE AND RURAL DEVELOPMENT
SYLLABUS FOR THE WRITTEN EXAMINATION FOR THE POST OF
ASSISTANT MANAGER IN GRADE 'A'**

FISHERIES

(The syllabus is illustrative and not exhaustive. The syllabus should not be considered as the only source of information while preparing for the examination. Keeping in view the nature of examination, all matters falling within the realm of the subject concerned will have to be studied by the candidate as questions can be asked on all relevant matters under the subject. Candidates appearing for the examination should also prepare themselves for answering questions that may be asked on the current/latest developments/Acts taking place under the subject(s) although those topics may not have been specifically included in the syllabus.)

Fishery, Biology of Finfish, Shellfish including Molluses :

Taxonomy of Fishes, Anatomy and biology – food and feeding habits, growth, age, reproduction, embryonic development, migration and raciation.

**Capture Fisheries -
Fresh Water Fisheries :**

Survey of freshwater capture fisheries of the world. Freshwater Fisheries of India, craft and gears used in inland waters, Riverine, estuarine and lacustrine, brackish water and pond fisheries. Capture fishery of carps, common carp, Chinese carps, catfishes, airbreathing fishes, feather backs, hisla, trash fishes, hill stream fishes – Mahaseer and trouts.

Marine Fisheries :

Survey of Marine fisheries of the world. Marine fishery resources of India. Definitions of benthic, oceanic pelagic and demersal fisheries. Capture fishery of sardines, mackeral, tuna, Bombay duck, ribbon fishes, white fish, seer fish pomphret, sharks, sciaenids, polynemid flat fishes, catfishes, mullets, mik fish, prawns, lobsters, cephalopods, pearl oysters, mussels, chanks.

Population Dynamics :

Principles of population dynamics, importance of studies on population and bearing of fishery biology on population, unit stocks in temperate and tropical waters, problems of age, rates of growth, recruitment of mortality, catch stock, effort, analytical approaches to population management and problems of overfishing.

Fishery Management :

- Conservation, management and development of fish and fishery resources. Exploitation. Fish stock. Hatcheries.
- River improvements and their effect on fish stock, spawning facilities. Fish passes, siltation of dams and their relation with fishery ecology.
- Weed infestation, dereliction of water bodies and implication of aquatic ecology. Pollution in rivers and estuaries. Water supply, drainage and fisheries.

- Fishery administration, protection improvement and conservation of resources.
- Planning and finance personnel management, use of fishery data and their role in commercial fishery management.
- Fisheries research and teaching institutions in India and their organisation and function. FAO of UN and its role in international fisheries.
- Fisheries legislation, laws of the sea, territorial waters, EEZ, Maritime Zones of India Act, 1981. Indian Fisheries Act, 1897. Demands for their amendments relevant to overall fish development.
- Deep sea fisheries development in India – India's coastal and off-shore resources – harvesting, post-harvesting activities in India.
- On-shore facilities for marine fisheries – harbours, landing centres – traditional fishery sector, mechanisation of fishing boats / gears, deep sea fishing fleet – Development through joint venture and transfer of technology.
- Export of fish and fish products – trends in development marketing for domestic and export trade.
- Support of ancillary industries to overall development of fishery.

Aquaculture :

History of Aquaculture :

- Aquaculture in the world, principles of aquaculture, scope and importance, pond productivity. Culture fisheries in India – Agencies to promote aquaculture in India. Role of financing agencies, input mobilisation, response – rural aquaculture.
- Brackish water fish / prawn farming, prawn seed – hatcheries – technology.
- Mariculture – resources – technology, sea ranching, oyster, green mussel, weed cultivation.
- Preparation and management of nursery, rearing and stocking ponds, brooder ponds, predator control, weed control, algae bloom, cultivable species, stocking ratio, survival, growth and production, manuring, feeding. Intensive aquaculture – technology in Japan, Israel, Taiwan, South-East Asia – Philippines – Cage culture. Running water fish culture, integrated aquaculture – recycling of organic waste, fish ponds and public health.
- Soils – their formation and structure, chemistry and conservation. Water quality, types of waters.
- Genetics and Breeding – principles of genetics, modern trends in genetics, reproduction, hybridization in fishes, neuro-hormonal influence on breeding – maturity and fecundity – hypophysation – breeding techniques, riverine seed collection, bundh – breeding – influence of temperature, photoperiod – hatcheries, indoor and commercial hatcheries – carps breeding, airbreathing fish breeding, mahaseer breeding – trout hatcheries fishery policies and priorities.
- Rearing of fish seed transport, stocking.
- Reservoir fisheries – resources in India – potential, production, management. Coordination with respective agencies.

Farm Engineering :

Definition, applications and economic principles to fisheries, consumption, utility and demand, price and income elasticity, law of diminishing returns, theory of cost of production, elastic factor of supply of fish, uncertainty, risk and profiles in fishing, large scale and small scale production in fishery, fishing industry, national income from fisheries rent and common property, inflation and deflation, international trade and exchange, savings and income, investment and employment in fisheries, wages, rationalization of fishery industry, planning and financing scheme, project appraisal in regard to aquaculture, small scale fishing, mechanized fishing, deep sea fishery industry, processing economics.

Fish Marketing and Co-operation :

a) General principles of marketing, theory of perfect and imperfect markets, price determination in fish markets, channels of distribution of fish, middlemen in fishery trade and fish marketing in India, trends and scope for improvement, sales promotion and procedure in fish markets, importance of regulation of fish marketing, price support measures for fisheries in some advanced countries, utilisation and demand pattern for fish, importance of processing of fish for marketing, balance of trade and world trade in fishery products.

General co-operative principles, co-operative movement in India and elsewhere, various types of fishery co-operatives, working of fishery co-operatives in India. Importance of legislation, study of state undertakings, private enterprise, corporations and relative role of co-operative sector, indebtedness of fishermen, socio-economic problems of fishermen, working conditions and welfare of fishermen.

b) Importance of market surveys, marketing techniques, economic aspects of packing, packaging and labelling fishery products, promotion of sales, advertising techniques, pricing the products, role of Marketing Manager, budgeting, planning and decision making.

Fishery Planning, Finance and Management :

Fish development programmes in Five Year Plans – their implementation, fishery policies and priorities.

Post-Harvest Technology in Fishery :

Fish processing, freezing, canning, drying, smoking, pickling, fishery by-products – low value fish handlings. Quality control, food laws and management food processing machinery, on-board equipment.

Fundamentals of Extension, Education & Rural Development :

- Extension Education – its meaning, definition, characteristics, objectives and principles. Relationship among teaching, research and extension education.
- Community Development – its meaning, definition, characteristics, objectives and principles. Place of extension education in community development.
- Rural development strategies in India, community development programme, intensive crop development strategies and allied programmes for weaker sections of the community such as IADP, IAAP, HYVP, multiple cropping, SFDA, DPDA, IRDP, etc.
- Recent extension strategies such as operational research projects, village adoption, T & V system, lab-to-land, etc. Organization of extension services in Agricultural Universities and other private / Quasi Government Organisations.