UNIT – II: Freshwater Fish Ponds and Their Classification

II.1 Introduction

Freshwater habitats are classified based on temperature, light, and vegetation. They are mainly divided into two groups – lentic and lotic ecosystems. Lentic systems are still water bodies such as lakes, ponds, and swamps. Lotic systems are flowing water bodies like rivers, streams, and creeks. The study of freshwater ecosystems is called limnology. Various ecological factors such as temperature, pH, dissolved gases, turbidity, and depth influence the habitat and organisms. Hence, studying freshwater ecosystems is essential to understand the life processes in aquatic systems.

Classification of Ponds

Fish ponds are classified based on water source, drainage, construction materials, and construction method. Each pond type has specific uses in fish farming and depends on local landscape and water availability.

1. According to the Water Source:

a) Spring-water ponds are supplied by springs located in or near the pond. The water quality remains constant throughout the year. b) Seepage ponds get water from underground water tables and their levels change with the groundwater level. c) Rain-fed ponds depend on rainfall and runoff, holding water during the wet season and drying in summer. d) Ponds fed from streams, lakes, or reservoirs receive water directly or indirectly through channels. e) Pump-fed ponds are supplied with water by pumping from a nearby source.

2. According to the Means of Drainage:

a) Undrainable ponds cannot be drained by gravity and depend on natural seepage or evaporation. b) Drainable ponds are built at higher elevations and can easily be drained by gravity. c) Pump-drained ponds require mechanical pumps to remove water completely.

3. According to Construction Materials:

a) Earthen ponds are made entirely of soil and are the most common type. b) Walled ponds are surrounded by concrete, brick, or wood. c) Lined ponds are covered with rubber or plastic sheets to prevent leakage.

4. According to Construction Method:

a) Dug-out ponds are made by excavating soil to create a basin. b) Embankment ponds are formed by building dikes above ground level. c) Cut-and-fill ponds combine excavation and embankments on sloping land.

II.2 Functional Classification of Ponds

Fish ponds are also classified based on their use in fish farming: 1) Spawning ponds for breeding fish and producing eggs. 2) Nursery ponds for rearing larvae to fry stage. 3) Brood ponds for maintaining adult breeding fish. 4) Storage ponds for holding fish before marketing. 5) Fattening ponds for growing fish to market size. 6) Integrated ponds for combining fish culture with crops or livestock. 7) Wintering ponds for keeping fish during cold seasons.

Nursery Ponds:

Nursery ponds are used for rearing 3-day-old larvae to fry stage (2–3 cm) for about 2–4 weeks. The ideal size is 0.01 to 0.05 ha with a water depth of 1–1.5 m. The pond is rectangular and flat-bottomed for easy netting.

Rearing Ponds:

Fry are grown into fingerlings (10–15 cm) in rearing ponds for 2–3 months. Each pond covers 0.05 to 0.1 ha with a water depth of 1.5–2 m.

Stocking Ponds:

Stocking ponds, usually 1–2 ha in area and 2.5–3 m deep, are used for growing fingerlings to table-size fish over 8–10 months.

Bio or Treatment Ponds:

These ponds act as settling tanks to purify water biologically. They cover 7–10% of the total fish farm area.

Basic Types of Ponds

1. Sunken Pond:

The pond bottom lies below the ground level and is fed by groundwater or rain. It is mostly undrainable or partially drainable.

2. Barrage Pond:

Formed by constructing a dam across a valley. It is drainable through the old river bed and may include spillways and diversion canals to control floods.

3. Diversion Pond:

Water is diverted from springs or streams through canals. Built either on sloping ground or as four-dike ponds on flat land. They are usually drainable.

II.3 Wintering, Quarantine, and Isolation Ponds

Wintering Ponds:

These ponds are used during winter to keep adult and young fish alive in cold conditions. Well-fed fish are stocked at high densities. Such ponds are common in temperate regions.

Quarantine or Isolation Ponds:

Quarantine is a biosecurity practice used to isolate new or diseased fish before introducing them to main ponds. Fish are observed for disease symptoms, acclimated to farm water, and treated if necessary. Water from these ponds should not mix with the main system. Quarantine prevents disease spread and allows recovery from handling stress.

Proper isolation systems, separate water supplies, and strict sanitation reduce pathogen transmission. Observation, diet adjustment, and sampling help ensure fish health. Consultation with fish health experts and compliance with regulations is important during treatment.