

Pond Maintenance

Aside from feeds and water management, the following pond maintenance procedures are carried out: regular application of fertilizers, lime, and pesticides; prevention of entry of predators; monitoring of the stock for growth rate determination as a basis of feeds and water management; and regular pond upkeep and maintenance.

- **(i) Fertilization**

- Extensive ponds are fertilized regularly using either organic fertilizers like chicken, cow, or pig manure, or inorganic fertilizers like urea, ammonium phosphate, or both, to maintain the plankton population in the pond.

- **(ii) Liming**

- In addition to fertilization, ponds also need to be given regular doses of lime to maintain water pH at alkaline or near-alkaline levels (preferably not lower than six). Agricultural lime is broadcast over the pond and applied on the sides of the dikes to correct soil and water acidity.

- **(iii) Elimination of Pests and Predators**

- Unwanted and predatory species which may have survived the application of pesticides during pond preparation or which were able to enter the pond through the gate screens or through cracks in the dikes, are eliminated by the application of pesticides, preferably organic, into the pond.
- It is also important that the gates are properly screened and the screens kept whole, to prevent the entry of small unwanted fish into the pond. Double screens are usually installed at the main intake to ensure that pests and predators are prevented from entering the pond system.



Build a Fish Pond

(iv) Stock Monitoring

- The culture organisms are monitored closely and regularly to determine their rate of growth and the general condition of the stock. They are regularly sampled for length-weight measurements as a basis for determining/estimating their biomass in the pond and therefore their daily feed rations, as well as for making projections on harvest schedules and procurement of pond inputs.
- In the first few months of culture, the feeding tray is a good tool for stock monitoring, As the organisms grow in size, cast-netting is used as a sampling tool, with those caught in the throw of the cast net providing an indication as to sizes and weights of stock. Based on the sampled weights and the daily feed consumption, it is possible to predict the available biomass (i.e., stock surviving after initial mortalities) and make projections on volume of harvest. For this purpose, it is essential that accurate records are kept for analysis at a later time. Data on initial size/weight and number of fry/post larvae stocked, average body weight at each sampling, and feed consumption on a daily basis, are important to have on file.

(v) Regular Upkeep and Maintenance of Facilities

- The pond dike and gates are checked regularly for cracks that could lead to seepages and losses of stock. The dikes are best planted with grass or vegetative cover to prevent erosion. The gates and other support infrastructure are properly maintained for efficient operation.

Other Maintenance Process

1.1 Maintenance of Earthworks

- During the first years of operation fish ponds need the most maintenance, as the unforeseen, hidden faults occur at this time. For example, the unexpected subsidence and settlement of dikes, and the more serious erosion on the surface of dikes and excavations occur . One can expect the following troubles with dikes: slope failure, soil slip, notch, slight erosion of the slope, etc.
- Maintenance must ensure the original water supply capacity of the canals. Erosion occurring on the bottom level and on the surface of the slope, soil slip and notch must be corrected at least once a year.
- At the same time accumulated silt and mud must be removed and vegetation obstructing free water flow must be moved or removed.
- On the bottom level of the fish ponds the mud must be removed from the internal harvesting canals after the drainage of the pond. Maintaining of good condition can be assisted by setting the feeding places in these canals.

1.2 Maintenance of Biological Slope Protection

- Biological slope protection needs constant thorough checking and maintenance, as wave action can cause erosion of the slopes. Usually a strip of planted reed is applied for biological slope protection. Where the reed is not strong enough temporary brush work protects the earth slope.
- The deficiencies in the reed strip must be replaced. The protecting reed strip must be treated continuously.
- Recently new biological slope protection methods have been elaborated, when some plastic materials (geotextile, plastic net) are applied on the earth slope desired to be protected and the plastic together with the plants and roots forms a protecting layer.

1.3 Steel Structures

- Elements of steel structures must be protected against corrosion. Each year, built-in structures must be cleaned with a wire-brush during breaks of operation then one layer of rust-preventing paint and two layers of oil paint must be applied. Moving elements of the structures must be regularly oiled or lubricated.

1.4 Maintenance of Water Control Structures

- Checking of structures must be carried out by separate checking of the elements (concrete parts, steel structures, flash boards). Sediments and the mud must be removed from the structures before operation begins.
- Leakages occurring at the joints of structures can cause cavities which must be filled with properly compacted earth, and where it is necessary, with concrete. Leakage can be eliminated by repairing the joint or by application of bitumen filler.
- If there are settlements of the structures or as a consequence of them there are cracks in the structures, the method of reconstruction must be determined separately in each case depending on the given problem.

1.5 Stone and Concrete Linings

- If the stones become loose in the linings or the filling material is damaged the stones must be replaced. Settlement of the dike can cause damage of the lining. The same damage can occur if waves wash away the bed of lining or the supporting earth. In such a case the lining must be removed from the damaged areas, the slope must be filled up with bedding material, then new lining must be made.
- The most frequent fault of concrete lining is under-washing. Reconstruction is the same as in the case of stone lining.
- Erosion at the ends of the lining must be filled with gravel as soon as possible, as otherwise the lining will be destroyed very easily.