

## Study of Ponds in Village, its use, Causes of Degradation and some Conservation and Management techniques.

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**Abstract :** Water is the crucial source of life. It is the basic ingredients to life. In our day to day life water fulfills all our daily requirements. Water is important for the ecological balance of the earth. Not only for human life but also because of plants it seeks so importance.

**Key Words :** Water, Ponds, village

### Introduction:

Ponds are the small water bodies formed naturally or by artificial means. These are used by the anthropogenic society. So its monitoring is necessary for control. It is different from a river or a stream because it does not have moving water and is no more than around 1.8mtr deep.

Ponds may be fresh water or brackish. The light penetrates to the bottom of the water body and lack wave action on the shore line.



Fig. Village Pond

### POND PLANTS:

For a flourishing pond, it must have native plant growing in or around it as they provide food, oxygen and shelter for the birds and the animals. Smallest plants are microscopic phytoplankton and these contributes most of the food in a pond. Phytoplankton form be the first part of food chain.

Area where vegetation grows around the pond is called zones. Meadow sweet grow in the bank side zone. Yellow iris and mud sedge grow nearest to the pond edge in the marsh zone. These are the shelters for some pond animals like young frogs and the tall stems are used by dragon fly nymphs. Frog bit is found in aquatic zone floating on the surface. In case of water lilies the roots are buried to the bottom of the pond, mud while its leaves float on the surface.

From ages pond are an essential part of people life and nearly every village and farm in India had a pond. Early human and animals rely on pond water but as technology advanced, water

become available at the turn of the tap. So nowadays ponds were neglected. Some ponds are filled in to make way for buildings and farmlands.

#### FRESH WATER PONDS:

Ponds are fresh water habitat having standing water varying in size. Small ponds are seasonal while the larger ones are perennial. The water is not stagnant, it is slowly circulated by wind. It is found that the pond which have size less than 1 hectare are 27740000 and ranging 1- 10 hectare are 24120000 in number. (CREGHINO et al 2013). It is also estimated that they contributed 30% of the global standing water by surface area (Downing et al. 2006). They cover approximate 90% (304 million of global standing water bodies (CREGHINO et al. 2013) they seeks so important as they provide many eco service system viz. social, cultural, economic, scientific, medicinal and aesthetics.

#### USES OF POND:

- Ponds are life line for villagers:

It is the main source of water for the rural folks. They used to feed their cattle, use for household purpose, the children used to learn swimming in these ponds. Female used it for washing cloth, so the villagers are heavily dependent on these water bodies.



Fig. 3 Cattle Bathing in Village Pond

- Pond as Rich Reserve Birds of Biodiversity:

Ponds are the rich reservoir for abundant flora and fauna. The light, temperature and climatic condition regulate the functioning of pond eco system. They constitute bio diversity hot spots with in a landscape (Williams et al. 2004, Karan's et al. 2005) It is a self regulatory fresh water eco system. The pond has abundant and diverse vegetation, uncountable micro-organism and a appropriate number of plants and animals present in relatively shallow and standing water.

The a biotic components of the pond eco system contains simple inorganic substances like CO<sub>2</sub>, O<sub>2</sub>, Nitrogen, Calcium, Phosphorus and their relative compounds. Organic compound such as amino acids, humus etc Nutrients are present in trace amount whereas the big part of these compounds presents in the bottom sediments and in the organism themselves.

The biotic components include the producers and the consumers.

- Phytoplankton like Volvox, Anabena.
- Filamental algae include Oedogonium, Chara, Spirogera
- Submerged plant
- Surface floating plants like Eichhornia

Consumers involves animals in the pond like turtle, frog, duck, swans, earth worms, Migratory water fowls like herons.

Trees like Neem peepal, Bargad, Shisham, Doob, Desi Kikar are found in the near periphery.

Plants like water hyacinth, lotus, water lily, amazon lily are found in the pond water. It provides appropriate habitat to many plants and many animal species.

- Medicinal, scientific and aesthetic values

Various edible and medicinal plants are found inside or in the wet periphery of the pond like sweet flag, water hauthorne. It is a deep water plant having floating leaves and vanilla scented flowers. So it attracts various birds and animals. As the migratory birds visit these water bodies for resting and feeding, so they become an important site for bird taxonomist. It provides opportunities for training and research.

- Social, Cultural and Religious Values

Ponds are the important place for dwellers for the gathering entertainment and recreational activities. In summer, children used to enjoy their a lot play and learn swimming. Usually melas and fair are held near those ponds. Many ponds have historical significance, some are sacred pilgrimage sites for performing various



rituals . Ponds are the connecting link between the people and the nature.

- Other Eco System Services:

They play a significant role in Carbondioxide concentration balance in environment. It provides food like fishes, Clay is used for pot making by the villagers. It helps in climate regulation as it is a source and sink of green house gases.

#### CAUSES OF DEGRADATION:

- Pollution:

The main cause of pollution is the dumping of village waste in pond like holy waste, animal waste like dung cakes, detergents which they used for washing clothes, village waste also contains human excreta, washing of agricultural tools and machinery like tractors, agriculture pollution. These various factors leads to the eutrophication of village pond.



Fig. Garbage Dumped around Village Pond

- Encroachment:

The villagers used to fill the pond for expending their agricultural land. Moreover, for the construction of diggi, panchayat bhawan, water pump houses, dharamshala, playground, construction of park and for making school and colleges. As they use clay soil for pot making, so excessive digging cause the change in the soil type i.e. clay soil to sandy soil, which cannot withhold for the water for a long run.

- Invasive Plant:

Invasion of exotic plant species like *Eichhornia crassipes* (water hyacinth) It is one of the invasive weed found growing in ponds. It has broad leaves with spongy petiole. Its spread enormously and covers the water surface completely drains oxygen from the water which leads to death of fishes. It was introduced in India, because of its beautiful violet colour



Fig. Water Hyacinth in Village Pond

flowers and shape of leaves. Since it promotes vegetative at a phenomenon rate and covers the entire water body in a short period of time, it is very difficult to get rid off them.

#### CONSERVATION AND MANAGEMENT:

- **Separate Disposal of Village Waste:**

Due to poor drainage system in villages, the waste are dumped in pond which are the main cause of degradation, so there should be a separate place or site for the dumping of village waste water. Nowadays people are aware about the protection of pond and started making separate disposal area of village waste.

- **Free from Cattle Dung Cakes**

Villagers use the area around the pond to load the cattle dung cakes for sun drying. So during rainy season, these cakes along with rain water fall in to the pond which is the major cause of degradation.

- **Permanent Boundaries**

The pond should be surrounded by permanent boundaries as it helps prevent the agricultural runoff to mix with the pond water. Fencing should be done to prevent the pond water from becoming dumping site of solid and liquid waste. These area provide the sites for the mosquitoes to laid eggs and spread various diseases. Boundaries also play an important role in encroachment for the purpose of agriculture or building houses.

- **Preventing Washing.**

Earlier villagers use to wash clothes in pond water discharging detergent into it, which degrades the pond. The problem was severe in the past. Nowadays, supply water or handpumps in every house of the village reduced the problem. Washing of tractors and agricultural tools releases Greece, oil and other chemical substances which make the pond water unfit for use. So by preventing of washing clothes, tractors, we can protect the ponds for our next generation.

- Preventing dumping of Holy Waste in Pond due to religious faith

- Control of invasive species (mainly water hyacinth.

- Awareness creation.

- Desiltation of Pond

During the rainy season the runoff water contain soil, waste and other organic particles which leads to filling of ponds with mud and cause the eutrophication so desiltation of pond should be done regularly.

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