



An Assessment of Biodiversity in Periyathampanaipond, Chettikulam, Vavuniya.

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INTRODUCTION:

In origin, a pond is a variant form of the word pound, meaning a confining enclosure. A pond is an area filled with water, either natural or artificial, that is smaller than a lake [1]. It may arise naturally in floodplains as part of a river system, or be a somewhat isolated depression (such as a kettle, vernal pool, or prairie pothole). It may contain shallow water with marsh and aquatic plants and animals. [2]. Ponds are frequently man-made, or expanded beyond their original depth and bounds.

The water in a pond is layered according to temperature, oxygen and life. The topmost zone near the shore of a pond is the littoral zone. This zone is the warmest since it is shallow and can absorb more of the sun's heat. It sustains a fairly diverse community, which may include algae, aquatic plants, snails, clams, insects, crustaceans, fish, and amphibians. The vegetation and animals living in the littoral zone are food for other creatures such as turtles, snakes, and ducks.

The near-surface open water surrounded by the littoral zone is the limnetic zone. The limnetic zone is well-lighted and is dominated by both phytoplankton and zooplankton and freshwater fish. Plankton are small organisms that play a crucial role in the food chain. Plankton have short life spans when they die, they fall into the deep part of the pond, the profundal zone. This zone is much colder and denser than the other two. Little light penetrates all the way through the profundal zone. The Benthic Zone consists of mud and decomposing organic material. This area is below the level of light and contains little to no oxygen [3].

. They, therefore, provide an important source of biological diversity in landscapes. Ponds are used for the provision of fish and other wildlife including waterfowl, which is a source of food for humans. Ponds are also a major contributor to local ecosystem richness and diversity for both plants and animals [2].

An aquatic animal is an animal, either vertebrate or invertebrate, which lives in the water for most or all of its lifetime. [4] Many insects such as mosquitoes, mayflies, dragonflies and caddisflies have aquatic larvae, with winged adults. Aquatic animals may breathe air or extract oxygen that dissolved in water through specialized organs called gills, or directly through the skin.

Sri Lanka, with the total land area of 65, 610 km square is a tropical island situated in the Indian Ocean. The Southwestern region of Sri Lanka, encompassing approximately 20, 000 km square is the only a seasonal ever wet region in the whole of South Asia [5]. Wet zone of Sri

Lanka along with the Western Ghats of India is designed as one of the world's biodiversity hotspots, in demand of extensive conservation investment [6], [7].

Periyathampanaikulam is located in Chettikulam. Periyathampanai pond is located in chettikulam, Vavuniya. It was rehabilitated by the Ministry of Economic Development in 2012. Length of the bund is 1615m and full supply depth is 2.87m. It is useful for farm activities and 114 families are benefited. It contains variety of aquatic plants and animals. Ponds are also a major contributor to local ecosystem richness and diversity for both plants and animals. So we must serve and protect our environment. In Future environment will be protected by the students. So the ponds and some aquatic organisms also will be studied by the students. Our research will assess the aquatic organisms in Periyathampanaikulam pond.

The present study is to assess the aquatic organisms in Periyathampanai pond, analyse and find out the scientific names, structure and uses.

MATHODOLOGY:

QUADRAT SAMPLING METHOD:

Quadrat sampling is one of the most useful way of obtaining quantitative information about the organisms we want to survey. A quadrat is conducted by marking out a square on the site we wish to sample. The square should be set at a particular size depending on what we want to sample. Every organism found within our quadrat needs to be recorded [8].

MATERIALS REQUIRED:

Sticks

Net

quadrat work sheet

Plastic basin

Tray

Pan

Twin

Camera

METHOD:

- To use four 1m sticks and made the square shaped quadrat. It is 1meter square.
- We were put and conduct our quadrat in the pond site (near the bund).
- To observe and count the organisms present in our quadrat.
- Netting inside the quadrat and find the organisms.
- To record the findings on the work sheet.
- To take the photo graphs.
- Repeat the quadrat sampling and record it.



RESULTS:


The results of the present study an assessment of aquatic organisms in Periyathampanai pond, Chettikulam, Vavuniya are given below.





An Assessment of Aquatic organisms in Periyathampanai pond, Chettikulam, Vavuniya




An aquatic organism in Periyathampanai pond were identified and analysed. There are thirty-one organisms are identified. To find out the scientific name, structure and uses from the different sources. An aquatic organism's identification was done during the holidays and weekends.



Quadrat sampling method was used to assess the aquatic organisms in pond.



Table-02-An Assessment of Aquatic organism in Periyathampanaipond, Chettikulam, Vavuniya





S. No	Scientific Name	Vernacular Name	Structure	Uses
1.	<i>Sympetrum flaveolum</i>	Yellow winged darter 	It has head, thorax and abdomen. Head is large with very short antennae. It contains two compound eye.	It acting as a natural pest controller [9].
2.	<i>Lymnaea stagnalis</i>	Pond snail	Height of an adult shell is 45-60mm.	It is used in researches. It is a bio indicator of aquatic




			Shells are brown in colour.	contaminant. Its mucus secretion limits the aluminum concentration of the aqueous environment [10].
3.	<i>Ligumia subrostrata</i>	Pond mussel 	It is stout and elongated. It is dull brownish in colour.	is food for fish. It is filter out the algae and clear the water. It is used as a bio indicator. It monitors the health of aquatic environment. It is used as a food for human also [10].
4.	<i>Stigeoclonium tenue</i>	Green algae 	It is bright green algae.	It reduces the carbon di oxide in the atmosphere. It is a food for animas and human. It is used to treat the cancer [9].
5.	<i>Nymphaea nouchali</i>	Water Lily 	Floating round leaves grow up to twelve inches. Flowers of native water lilies are large, showy, and	In addition, water lily creates excellent habitat for fish as it attracts small and large fish and their prey. Water lily is




			white, and have a sweet smell.	also a favorite of honeybees [9].
6.	<i>Brasenia schreberi</i>	Water shield 	Floating leaves are oval to elliptical. Leaves are green on top and purple underneath and grow two to five inches in length.	Water shield offers good cover and habitat for fish. The leaves make a great landing spot for insects.
7.	<i>Nymphoides peltata</i>	Yellow floating Heart 	It is an underwater creeping plant. Floating leaves are 3-15 cm. It is found in slow moving ponds, rivers and lakes.	Fresh leaves are used for headaches [9].
8.	<i>Marsilea villosa</i>	Water clover 	It produces long freely branching rhizomes that spread the plant along the mud. Leaves have	It is used as a food.



			four clovers like lobes and are either present above water or submerged.	
9.	<i>Elodea canadensis</i>	Water weed 	It has densely whorled, dark-green leaves. This plant is typically rooted but can survive and grow as floating fragments.	Elodea is commonly used as an aquarium plant. Its thick stems provide cover for young fish and are home to many invertebrates that serve as a food source. elodea is one of the most beneficial pond plants for its value as habitat and wildlife food. It is an excellent oxygenator.
10.	<i>Lythrum salicaria</i>	Purple Loose strife 	It can grow up to seven feet but is usually three to four feet tall. It has long, square stems with leaves in whorls of two to four. The narrow leaves	It has little or no benefit for wildlife or fish in ponds.



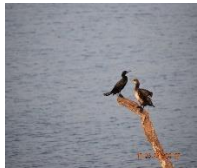
			are about one to four inches long and end in a point. Loosestrife produces clusters of purple flowers in a terminal spike.	
11.	<i>Potamogeton lucens</i>	Smart weed 	It has creeping rhizomes, branching stem, leaves are large and it is pale green shiny with netted veining.	It releases the oxygen and gives the shelter to organisms in pond.
12.	<i>Nuphar advena</i>	Spatter dock 	Leaf blades are 6-12 inch long.	It is used in traditional medicine. seeds and roots are edible [9].
13.	<i>Potamogeton crispus</i>	Pond weed –curly leaf	The curly edged leaves are alternate and finely toothed. Their wavy or	it provides food and habitat during winter and spring [9].




			rippled appearance has been likened to the edges of a lasagna noodle.	
14.	<i>Scirpus schoenoplectus</i>	Bulrush 	Bulrush has unique stems. Plants usually grow two to three feet tall.	Bulrushes provide habitats for many micro- and macroinvertebrates, which are eaten by fish and other wildlife. geese and muskrats consume the rhizomes and early shoot [9].
15.	<i>Eleocharis palustris</i>	Spike rush 	The stems are four to twenty-seven inches tall. Plants can also form submerged, grass like stands.	The root systems help to stabilize pond margins and prevent erosion. Spike rush is also used in wetland restoration projects. Stems are eaten by wildlife, and spikes are consumed by many birds.
16.	<i>Sagittaria sagittifolia</i>	Arrow head weed 	Arrowhead can grow one to one and one half feet high. The leaves can be broadly or narrowly arrow shaped,	Arrow head roots produce tubers that are often eaten by beavers, muskrats, ducks, and geese.


			lance shaped. They grow in wet areas around pond.	
17.	<i>Hydrilla verticillata</i>	Hydrilla 	The stems grow up to 1–2m long. The leaves are arranged in whorls of two to eight around the stem. flowers are rarely seen.	The plant contains vitamins, minerals, and antioxidants, as well as being useful for fighting indigestion. Hydrilla is known to have many digestive and health benefits [9].
18.	<i>Najas guadalupensis</i>	Southern naiad/ Bushy pondweed 	It is a slender, branching stem up to 60 to 90 centimeters in maximum length. They are edged with minute, unicellular teeth.	Seeds and vegetation are consumed by many species of ducks. It provides habitat for many micro and macro invertebrates.
19.	<i>Sparganium erectum</i>	Bur reed 	Bur-reed has long, erect, sword like leaves. It is submerged in up to four feet of water.	Plants are eaten by a variety of wildlife and provide habitat for many insects. They also make good nesting sites for some animals and birds. Humans can consume the plant tuber as a starch substitute [9].

20.	<i>Labeo rohita</i>	Rohu 	The rohu is a large, silver-colored fish of typical cyprinid shape, with a conspicuously arched head. Adults can reach a maximum weight of 45 kg and length is 2m.	It is used as a food and an aqua culture [12].
21.	<i>Oreochromis mossambicus</i>	Tilapia 	It has a deep body with long dorsal fins, the front part of which have spines. Native coloration is a dull greenish or yellowish, and weak banding may be seen.	Mozambique tilapia are hardy individuals that are easy to raise and harvest, making them a good aqua cultural species. They have a mild, white flesh that is appealing to consumers [13].
22.	<i>Ameiurus melas</i>	Black Bul head 	Catfish have a variety of body shapes, though most have a cylindrical body with a flattened ventrum to allow for Its	It used as a food. It is an important intermediate predator in the ecosystems in which they live [10].

			caudal fin is truncated. Its dorsal side is black and ventral side is white. benthic feeding. It has broad head, spiny fins and no scales.	
23.	<i>Oreochromis niloticus</i>	Tilapia 	It reaches up to 60 cm (24 in) in length and can exceed 5 kg. brownish or grayish overall, often with indistinct banding on their body, and the tail is vertically striped.	It is used as a food, aqua culture and researches [14].
24.	<i>Labeo catla</i>	Catla 	Catla is a fish with large and broad head, a large protruding lower jaw, and upturned mouth. It has large, greyish scales on its dorsal side and whitish on its belly. It	It is used in aqua culture and food [15].

			reaches up to 182 cm.	
25.	<i>Pelicanus crispus</i>	Dalmatian Pelican 	Male is 175 cm long, bill is 347-471 mm and 9-15 kg weight. Female is 148 cm long, weight is 5-9 kg and bill is 289-400 mm. Wing span is 225-360 cm. Plumage is white. Legs are pink in colour.	Pouch has been used for tobacco pouches and sheaths. Young pelicans are prized for fat. The oils derived from pelican fat are used for medicine in China and India. Skin and feathers are used to make leather [11].
26.	<i>Ardea intermedia</i>	Intermediate egret/Kokku 	It is 56-72 cm long and 400-500 g weight. Completely white. It has black legs and bill is black with yellow base.	It is useful in conservation genetics and phylogeny of the species [11].
27.	<i>Phalacrocorax fuscicollis</i>	Indian Cormorant/Neer kakam 	It is 65 cm long. It has slender bill and plumage is black with tinge of brown. Legs, feet and webbing is	Certain cultures would use cormorants for fishing.

			black in colour.	
28.	<i>Ardea grayii</i>	Indian Pond Heron/Indiya mudayan 	They appear stocky with a short neck, short thick bill and buff-brown back. In summer, adults have long neck feathers.	Heavy metals acquired from feeding in polluted waters. It eats the water hyacinth from the ponds. It will clean the pond [11].
29.	<i>Euphlyctis cyanophlyctis</i>	Indian skipper frog 	Head is moderate and snout is scarcely pointed. Fingers are slender and pointed. Toes webbed to the tips. Brown above, blackish streaks on the thighs.	It is pest exterminator, feeds different insects and their larvae [10].
30.	<i>Emys orbicularis</i>	Tortoise 	It is a medium-sized turtle, and its straight carapace length varies quite a bit across its geographic range, from 12 to 38 cm. The carapace	It is used as a food for human being [10].

			is dark brown to blackish, with a hint of green. The head and legs are spotted with yellow.	
31.	<i>Rhagovelia distincta</i>	Water skater 	It is small in size. Black in colour.	It is an effective predator for mosquito larvae [10].

DISCUSSION:

Pond is a natural aquatic habitat. Ponds are rich in plants and algae that serve as the foundation of the food chain for insects, fish, and other forms of wildlife. An aquatic animal is an animal, either vertebrate or invertebrate, which lives in the water for most or all of its lifetime. Aquatic plants growing in ponds and lakes are beneficial for fish and wildlife. They provide food, dissolved oxygen, and spawning and nesting habitat for fish and waterfowl.

Quadrat sampling method is used to identify the aquatic organisms in the pond. Almost thirty-one aquatic organisms are identified in Periyathampanai pond. There are different types of organisms such as algae, snails, fish, insect, plants, frogs, turtles, birds etc. These organisms also enrich the pond and our environment. Aquatic plants, both marine and freshwater, are used globally for food and fibre, as well as for biofuel and chemical precursors. Submerged plants also have an effect on water quality. Their ability to put oxygen into the water is an obvious contribution.

Submerged plants also are an important food source for many species. Floating plants also food for some species. Emergent plants provide nesting habitat for a variety of bird species, such as song sparrow, red-winged blackbird, and wrens. Aquatic insects play a major role in the aquatic ecosystem. They are break down and decompose the dead material at the bottom of the lake such as leaves, dead fish, and other organisms. They are also a major food source for fish, frogs, birds and other animals. Without insects in the pond, it wouldn't be a very nice place to fish. There are many fishes in the pond such as Catla, Rrohu, Tilapia, Bulhead etc.

Periyathampanai pond is useful for farm activities and 114 families are benefited. It contains variety of aquatic plants and animals. We must protect our environment. The present study is give the knowledge about an aquatic organism. We must save the pond and an aquatic organism.

CONCLUSION:

Aquatic ecosystems perform many important environmental functions. For example, they recycle nutrients, purify water, attenuate floods, recharge ground water and provide habitats for wildlife. For example, they recycle nutrients, purify water, attenuate floods, recharge ground water and provide habitats for wildlife. Indirectly aquatic plants provide economic benefits such as sustaining fisheries, water supply, and recreation. The health of an aquatic ecosystem is degraded when the ecosystem's ability to absorb a stress has been exceeded. A stress on an aquatic ecosystem can be a result of physical, chemical or biological alterations of the environment.

The current study is an assessment of an aquatic organism in Periyathampanai pond. The results revealed that there are thirty-one aquatic organisms are identified. We observe aquatic plants, fishes, insects, and birds. Water birds like Great white pelican, Indian cormorant, Intermediate egret, Indian pond heron also identified here. Dragonflies also have an important ecological role in the wetland ecosystem as predators that control the population of other animals.

Fish feed mainly on vertebrates, invertebrates, plant matter and microorganisms. Fish play a prominent role both as prey and predator in the wetland food chain and food webs, the pond fish assist in balancing the ecosystem health and wellbeing. They assist in controlling the mosquito population and contribute immensely to increase the biodiversity of the wetland ecosystem.

So we conclude that we must protect the pond and an aquatic organism in the pond. To conduct the awareness meeting to the Agricultural Development Society, Rural Development Society, Women Rural Development Society, Fishermen Development Society and School Science Club and create the awareness among the public and the students. We put the boards regarding the save the pond slogans and put the dust bins near the Periyathampanai pond.

An Assessment of an aquatic organisms in Periyathampanai pond also encourage the research in this field. The current study is an open for research in the ponds in the different areas and an aquatic organism with different aspects.

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Students

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