

## Indigenous water management system and Ecological implication in Natiya tank Cascade system In Sri Lanka.

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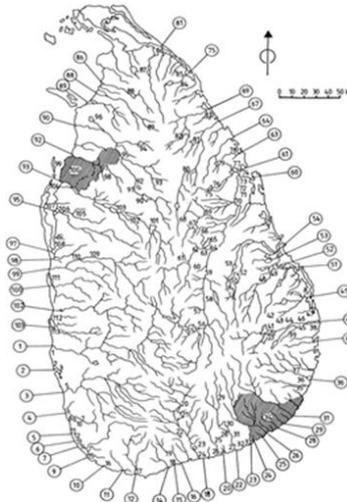
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**ABSTRACT:** Sri Lankan people had an interesting water management system and it helps to protect water and bio diversity. This research paper aims to explain indigenous water management system in Natiya Village and ecological implication of cascade system.

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### I. INTRODUCTION

Sri Lanka is an island nation with a total land area of 65,525 km<sup>2</sup>, located in the Indian Ocean, just off the southeastern tip of India. The Country southwestern parts receive most rainfall, especially between May and October, when the south-west monsoon strikes the island. The north region and most of the eastern part comprise the dry zone with Hambanthota and manner. Mountainous region are situated in the south-central part of Sri Lanka; the most part of the island consists in lowland with an average annual temperature of 30°C.



103 Main rivers In Sri Lanka, Source (<http://www.fao.org/docrep/003/T0028E/T0028E02.htm>)

A network of hundred major rivers and streams originate in the central highlands. The dry areas are not get rain every month of year .Sri Lanka had near to 100000 main mad tanks called Wewa. Even if some of them has been destroyed, Near to 25.000 main mad tanks are remaining yet. But they never build any wewa(Tank) in Central highland .If the build any tank in central highland it is destroyed natural water source which could provide water in low land Wewa(tank) .

### II. METHODOLOGY OF RESEARCH

Researcher is born in a rural village in Sri Lanka. He had experienced the village water management system and Cascade system; He uses life experience and two year research experiences to write this research article. From 2009 to 2011, two year field visit has being conducted in Daduru oya(River) valley ,collected data about indigenous water management system in Natiya village located in Daduru oya(River) valley .Literary reviews are selected as a research methodology to collect data for this research. Magazines, Scientific journals, books, newspapers and other journal were used to collect the secondary data.

**Cascade system in Natiya Village, Sri Lanka.** : According to different topography and eco system, also water collection systems are different. The Sri Lanka's management in manipulation of water is a fundamental aspect of bio diversity protection of water and sustainable agriculture. In Sri Lanka, mainly water is collected from monsoon using by manmade tank.

In Natiya village, small tank s has built more than 1000 years ago by indigenous people. There aren't isolated tanks. Those tanks located in Daduru oya Valley .The three small tanks can be identified within 2 Km. The Daduru oya is (river) feed water into Tissawa wewa(tanks) and after full fill Thissawa tank; The remaining water goes to the natural channel . This channel comes through paddy, while its coming water is spread through paddy. After full fill paddy, the water flows into another natural channel and it flows into the second tank, named "Nattiya wewa" (Tank).

When full filing Nattiya tank, water flows to main made channel .The channel is spreading water to Nattiya paddy field that is bigger more than five acres. Water is spreads over paddy and gathering to another channel .that water flows directly to the third tank called "Talkotagama tank".

When over flows Talkotagam Tank remaining water goes through channel and channel flows to the another small river named is Maguru Oya (River). The Natiya cascade System is an example for indigenous water management system in the villages. Each and every drop of water are not waste or destroy .Every drop of ware used for paddy cultivation and dally using of people's needs, such as bathing washing and drinking. This channel and tank system (cascade system) has been helped to sustainable protection and water using in the village. Furthermore, the same water is used several times because people concerned water as life while they are using water. They have allowed flowing that water into another tank. . They have been used natural water purity system to clean and flow the pure water through channel and tank.

**Water purity system in natiya Cascade** : A large size tree belts are located in Natiya tank cascade upper inundation area along the Tissawa , Natiya and Talkotagama tanks and alone channel which acts as a wind barrier and reduces the occurrence of waves in the tank. It reduces evapotranspiration in three tanks and connected channel. Tank catchment areas and tree belt covered by Kubuk (*Terminalia Arjuna*) ,Mee (*Madhuca Longifolia-Sapotaceae*), Attikka (*Ficus glomerata*), .the tree belt has being increase bio diversity of Nattiya village. Those tree roots covered the bottom of tanks and channel .Roots are functioning as water purification system in the channel and tanks. While flowing water through channel roots created barriers to water ,those are absolved all heavy metal as believe of people, holding all tree leaves which fall into the channel .those roots are holding all mud and humus. Water filter is dominated by sedges, rattan, shrubs and a grass retains sediments in runoff water between the tank and the tree belt, with the aim to predicate and to reduce salinity level in water. This natural filtering system assures a good quality of water for both people and paddy field.



Kubuk Tree ( **Terminalia Arjuna**)<http://www.mrt.ac.lk/>,

**Ecological implications of the Tank Cascade Systems in Natiya :** Nattiya cascade system integrates three tank, channel, paddy and river. This eco system keeps cool Nattiya area in the dry season. Within rain season, extra water has been stocked in wetland ecosystem (floodplain). While reducing water level in channel and tank, wetland releases the water into the channel and tank. Around the cascade, all people are extracting water from the ground for drinking purpose. Small wells are filled by rain water and wetland water. All tank, canal, river, paddy, tree belt, and wetland (floodplain) composed an integrated ecosystem. It does provide many environmental services from its biodiversity and important habitats for many flora and fauna species. At the same time it has created shelter resident and migrant water birds. The Nattiya cascade system has been created a microclimate and cooler habitat for the macro and micro species. It also has effected to protect the rich biodiversity in the Nattiya village, finally, it is useful to keep cool both environment and paddy.

Indigenous people are concentrated this cascade system in village not only for water management system but also for soil management system. The cascade system keeps cool soil layer in the paddy and forest area. The channels are not concreted yet. It's helped to leak the water through the bottom of channel and tank. Water leaks have been helped to keep soil wet even during the dry season. The forest is evergreen because of the water and soil management system. The cascade provides many ecological services to both nature and human being. At the same time, Nattiya tank cascade has been given life to tank catchment area. That area helps to keep a sustainable water level in the ground. People use the catchment area for sustainable extraction from trees and shrubs such as collecting medicine plant (*Terminalia Arjuna*), (*Madhuca Longifolia-Sapotaceae*), (*Creteva Adansonii ssp*) for Ayurveda preparation or using Pan (*Typha angustifolia*), (*scirpus Erectus*), (*Scelria Oryzoides*), (*Cyperus corymbosus*), (*Eleocharis palnterginea*) species to make carpet for sleeping bed. Nattiya cascade system had built thousands of years ago. It provides many ecological and sociological services. This cascade system is an example of indigenous water management way. It has helped to soil conservation of village.

### III. CONCLUSION

The Nattiya cascade System is an example for indigenous water management system in Sri Lanka. Each and every drop of water are not waste or destroy. Every drop of water used for paddy cultivation and daily using of people's needs, such as bathing washing and drinking. This channel and tank system (cascade system) has been helped to sustainable protection and water using in the village. The water management system in Sri Lanka Destroyed day by day since 1505. Many tank and cascade destroyed by the time of colonialized. Physical Development system plane, deforestation unplanned construction started to destroyed tank and cascade since 1948. It is going on now it self. While destroying Tank, River, Cascade, wetland, Willu (Natural ponds), Forest and rain forest will be created water scarcity in Sri Lanka in future.

### BIBLIOGRAPHY

- [1] Ausadahami Udulbandara, (2004), Wewa (Tank). Higurakgoda
- [2] Kariyawasam Ravindra, (2011), Purana wauw gammana (Ancient Tank village), Dehiwal in Sri Lanka.
- [3] <http://www.mrt.ac.lk/>,
- [4] (<http://www.fao.org/docrep/003/T0028E/T0028E02.htm>)