



The Bolgoda Ecosystem: A Laboratory in the Neighbourhood

1. Introduction

The Bolgoda wetland complex [Figure: 1] is located on the southwest boundary of the Colombo District and is considered the largest freshwater resource in the Western Province. In detail, Bolgoda (north) Lake and Bolgoda South Lake, which the Bolgoda river connects, are two vast freshwater bodies that cover an area of approximately 400 square kilometers. In addition to Bolgoda Lakes, the Bolgoda Basin consists of five other lakes: Boralesgamuwa, Gamanpila, Kesbawa, Uyanwatta, and Walgama and the Lunawa Lagoon. This wetland complex has been listed in the "1001 Natural wonders of the world: you must see before you die", published in 2017 by Michael Bright (Ed.), due to its ecological, social, and economic significance.

Bolgoda wetland usually receives considerable rainfall throughout the year, with peaks during the monsoons. Weras river, which travels through a major garbage dumpsite and an industrial zone, delivers the primary water source to the Bolgoda Lakes and the rain and runoffs from two small streams named Panape Ela and Rambana Ela fed by Maha Oya [1]. Further connections of the Bolgoda hydrological system exist through Bolgoda Canal & Kirulapone Canal to Kelani River, through Keppu Ela to Kalu Ganga, and through Thalpitiya Ela to the ocean south of Panadura Estuary.

Substances released into associated water sources are the key factor affecting the health of wetlands. Increased point source and non-point source pollution in this wetland complex through its major water source and other sources imply a timely need for steps towards protecting this complex, connected water resources, and associated ecosystems. Despite studies looking into biodiversity, land use, environmental issues, and co-existence of irrigation, etc. in the Bolgoda wetland complex, the findings of these studies have not been streamlined and

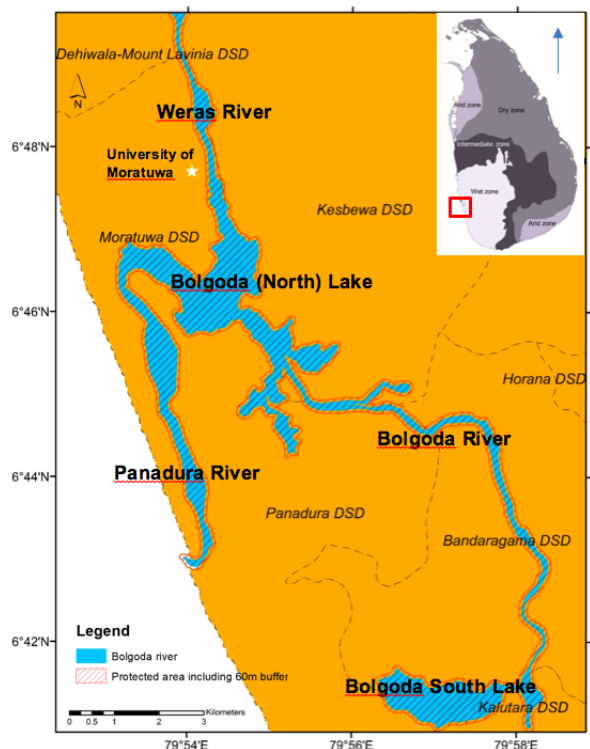


Figure 1: Extent of the Bolgoda wetland complex in Sri Lanka: The “Bolgoda Environmental Protection Area” comprising Weras River, Bolgoda River, Bolgoda Lake, Bolgoda South Lake, and Panadura River has a 60 m buffer zone declared in 2009 by a gazette notification (no. 1634/23). (Source CEA)

made accessible to all stakeholders to make necessary arrangements towards protecting this wetland complex. This article emphasizes the need to streamline the findings of scholars for the access of local communities and encourage research on Bolgoda wetland complex by the neighboring institutions.

2. Biodiversity & Land-use

Bolgoda wetland system [Figure 2] has been home to endemic and endangered fauna and flora and a



Figure 2: Bolgoda Lake

“ Coastal sand belts, marshes bordering the flood plains, and low-relief laterite hillocks are the three major geomorphological units that have influenced the land use patterns in this region. ”



Figure 3: Avifauna

resting place for migratory birds making it rich in biodiversity [Figure 3]. Studies revealed vertebrate fauna and higher species diversity of dragonflies in Bolgoda South Lake and significant faunal profiles from both lakes. Furthermore, endemic plant species from the south lake exceed the north lake [2]. The north lake has a limited floral diversity and a considerable growth of invasive plants including the Water Hyacinth (*Eichhornia Crassipes*) which is considered as the globe's worst invasive plant.

Coastal sand belts, marshes bordering the flood plains, and low-relief laterite hillocks are the three major geomorphological units that have influenced the land use patterns in this region. A noticeable increase of buildings and a significant decrease in vegetation indicates the degree of de-

forestation in the region. Even though the predominant land use of the Bolgoda is for residential purposes, an increase of commercial properties may have resulted due to inefficient regulatory procedures. As a result, parts of the Bolgoda wetland are transformed into highly urbanized areas and have experienced large amounts of underserved settlements. And the locals seem to choose livelihoods such as tourism and recreational activities including bird watching and water sports instead of traditional paddy cultivation or wooden craft industry.

3. Environmental Concerns

The sensitive environments of the Bolgoda ecosystem are increasingly disturbed by human activities. Discharge of effluents to Weras Ganga from Ratmalana Industrial Zone and leachate from the Karadiyana open garbage dumpsite are the dominant sources of pollutants in the northern parts of the ecosystem. The Weras Ganga has been a public nuisance for a long time, enforcing a direct threat to the groundwater and the ecosystem itself. Dumping of domestic waste into the wetlands has also become a common practice of residents and crocodiles finding them as a food source has raised death traps for freshwater fishermen. Protected areas of Bolgoda are also affected by encroachments, illegal land filling, unauthorized constructions [3] and mismanaged sawmills releasing wood waste and sawdust. Non-regulated tourism and watersports destroy the mangroves (despite the restoration efforts) in addition to the illegal prawn cultivation and sand mining.

The salinity levels of Bolgoda water can be primarily influenced by the river-mouth management at Panadura and contamination levels could vary depending on adjacent land use. Water quality variations and metal accumulation may influence the food-fish while abundance of suspended sediments can cause a direct threat on the entire ecosystem by depleting the light penetration through water. In general, Bolgoda water is not recommended for drinking, livestock or even for agricultural activities. Specially, the Bolgoda (north) Lake could well resemble the characteristics of Beira Lake and Lunawa Lagoon, unless timely corrective and preventive measures have been taken. Fur-

thermore, it is alarming to observe that Bolgoda Lake along with Madampe Lake was declared as the "Threatened Lakes of the Year 2018" by Global Nature Fund reports published in 2022.

4. Co-existence and Sustainable Development

Wellbeing of the societies were ensured by the lake ecosystems since the ancient civilizations in Sri Lanka. Co-existence of people in harmony with the environment while utilizing the natural resources and preserving them for future generations is the requirement and a responsibility. Yet, the Bolgoda wetlands having a significant biodiversity and largest freshwater lakes in the region are threatened by irresponsible land use and human activities despite a 60 m buffer zone has been declared in 2009 by a gazette notification on "Bolgoda Environmental Protection Area" which includes Weas Ganga, Bolgoda River, Bolgoda Lake north, Bolgoda South Lake and Panadua River. Obviously, Bolgoda is not an asset that could only be managed judicially, by enforcing the environmental regulations and monitoring.

The valuation of natural resources of a country is essential for policy development and decision making to sustainably manage them. The Bolgoda region being rich in environmental and biodiversity, certainly has the potential for rapid development if strategically managed through scientific and technical principles complimented by rational decision-making. For such initiatives, the basis must be the findings of scholarly work of enthusiasts & professionals, even though only a handful of such are currently available. The accessibility to such information for the public has to be streamlined primarily through libraries and encourage policy-makers and authorities to exercise scientific approaches complimented by transparent communication with local communities. Nevertheless, Bolgoda lakes, wetlands and rivers can be exploited as a living laboratory for educational research due to ease of access and neighboring to prominent academic institutions.

Colombo has been declared as one of the first wetland cities in the world by Ramsar Convention

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Secretariat in 2018. Hence, proper conservation and management of Bolgoda wetland is crucial in securing ecosystem services in Colombo District. Also, the healthy wetlands are considered as an essential and integral component for achieving the sustainable development goals (SDG's) derived by the United Nations. The goals 6-clean water and sanitation; 11-sustainable cities and communities and 14-life on land; are directly related to the urban wetlands, where Colombo District urbanization has been recognized as the main driver of wetland modification.

5. Conclusion

The developments must continue to happen, with minimal influence on the sensitive environments that should be treasured. Continuation of inappropriate land use and destructions to the environment in Bolgoda reveals, loopholes in the existing

regulatory framework and lack of scientifically driven approaches to preserve a valuable ecosystem. However, ongoing protective measures on the Bolgoda wetlands needs to be strengthened through reliable monitoring mechanisms with the involvement of self-motivated locals. The nearby educational institutions could encourage research and development activities on Bolgoda wetland complex while sharing the outcomes to empower local communities. Awareness programs on environmental, natural, social, economic, and historical value of Bolgoda region needs to be strategically and effectively communicated through transparent and unbiased information sharing. The local libraries and publicly shared documentation produced by the regulatory authorities could significantly contribute for the above efforts by providing access to up-to-date resources.

References:

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