EVALUATION OF THE IMPACTS OF THE NEW BRIDGE (*PUTHUPALAM*) ON THE BATTICALOA LAGOON

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ABSTRACT

The Batticaloa Lagoon is the most important natural resource in the Batticaloa District. However, negative influences, imparted by human activity have endangered the sensitive balance of this natural resource. The construction of New Bridge, called *Puthupalam* in Tamil is such an obstructive human intervention on the Batticaloa lagoon. The *Puthupalam* functions as a partial impoundment to the lagoon as it has very small openings to facilitate the natural water flow. It is obvious that the negative impacts arise in an aquatic ecosystem when that aquatic system is obstructed from its natural state. Hence, it is hypothesized that this bridge is creating a negative environmental impact on the lagoon ecosystem. Therefore, the scope of this research is to evaluate the impact on the lagoon ecosystem by the construction of *Puthupalam* and contiguous road across the Batticaloa lagoon.

In this respect, physiochemical parameters such as salinity, turbidity, depth, water velocity and dissolved oxygen of the lagoon were measured periodically. The results show that there are differences in some physiochemical parameters on either side of the bridge. Indigenous knowledge (i.e. past experiences and case studies), which was collated from local fishers regarding the effect on the structure and distribution of fish fauna, also indicate the effect on the biota. However, these results of field sampling are not merely enough to prove the hypothesis. Therefore, a modeling approach was used to simulate (as an explanatory measure) the changes in physiochemical parameters of the lagoon water in response to the construction of the *Puthupalam*. In this modeling approach, commercially available modeling software STELLA Version 7.0.3 was used to develop a conceptual model, called **N-BIOL** for the Batticaloa lagoon in the area of concern. The outputs of this model show the effect on to the aquatic biota as a result of the changes in environmental parameters and outputs of this model along with the field results prove the hypothesis. Thus it is concluded that the *Puthupalam* imparts negative impacts on the Batticaloa Lagoon system. Further, use of Indigenous Knowledge based ideas and use of simulation model to explain systemic processes in addition to traditional linear sampling methods can be argued as the positive features of this project, which strives to provide a holistic and comprehensive explanation to the problem of concern.

Keywords: Biodiversity, Biota, Ecosystem, Lagoon, Physiochemical parameters, Simulation model.

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