

## ANALYSIS OF INFLUENCES IMPARTED BY UNPLANNED BRIDGES ACROSS THE BATTICALOA LAGOON TO ITS BAR-MOUTH MECHANISM

S. Santharooban<sup>1</sup>, M.Manobavan<sup>2</sup>

A well functioning bar mouth mechanism is a key determining factor of the overall stability of the Batticaloa lagoon system. The bimodal functionalities of: a). closing of the bar mouth in the dry season, and, b). its opening in the wet season, are rhythmic processes that are necessary for the local ground water recharge involving the lagoon, fish transmigration and overall ecological stability of the locality. It is speculated that the recent developments (1980s onwards) in the lagoon area in the form of unplanned bridges (that restrict the lagoon's natural flow due to their comparatively low provisions on flow widths) have induced negative impacts to the normal rhythmic patterns exhibited by the bar mouth mechanism. A common observation is that the administration of the district is in difficulty in making the right management decisions as no previous attempt has been made to analyze this mechanism scientifically.

In this respect, this paper is an exception and is unique in the sense that it provides with an analytical frame work using a conceptual model for exploring plausible management scenarios. The Batticaloa lagoon system was mapped out and modeled on the Stella (version 7.0.3) modeling platform using elementary building blocks of stocks and flows to mimic the natural processes and the bimodalities. The prototype of the model **BIOB (Bridge Impact On Bar mouth) version 1.1** was then tried out to check out its scientific logic. As such, the finalized form of the **BIOB Version 1.2 (BIOB v1.2)** was created once the conceptual changes of the acceptable logic were made to simulate realistic processes.

Simulations of different plausible scenarios using the model, stress the critical necessity to improve the flow widths of the bridges for the overall stability of the lagoon system. It is stressed that the sustainable natural resources management in the lagoon area could be improved if the key findings presented in this paper are incorporated into the development of a comprehensive management plan for the Batticaloa Lagoon Special Management Area. Moreover, the **BIOB v1.2** could also be used as an effective user friendly tool to aid in effective decision making in the management of the lagoon system.

**Key words:** Bar mouth mechanism, Flow width, Rhythmic processes, Scenario, Model, Management, Decision making

---

<sup>1</sup>Department of Zoology, Faculty of Science, Eastern University, Vantharumoolai, Chenkalady, Sri Lanka

<sup>2</sup>Resource Development Consultants Ltd., Colombo, Sri Lanka