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Flood Disaster, Wetland Loss and Ecosystem Services: Community Perceptions-A Case Study from Muthurajawela Wetland Complex, Sri Lanka

Siriwardhana S.T.^{1*}, Gunawardena A.², Mallawatantri A.³, Wickramasinghe D.D.¹

¹*Department of Zoology and Environment Sciences, University of Colombo, Colombo 03, Sri Lanka*

²*Central Environmental Authority, Sri Lanka*

³*International Union for Conservation of Nature, Sri Lanka*

**sandanisiriwardane94@gmail.com*

Abstract

Urban expansion and population growth are increasingly apparent in many parts of Sri Lanka with significant impacts on the environment. Urban areas often have little room for nature. Yet, remaining ecosystems or habitats extend valuable ecosystem services to the communities. Ecosystems, therefore present avenues to serve humanity and enhance community resilience to many stressors including natural disasters. This study focusses on Muthurajawela Marsh which is the largest coastal wetland in Sri Lanka. Even though this large wetland (3,068 ha in extent) provides provisional, regulatory, cultural and supportive services, how the residents value those services are largely not known. The present study examined how wetland loss has attributed to increased flood impacts as well as impairment of ecosystem services provided by the wetland to increase the resilience of the community. Loss of extent of the wetland was studied using Arc GIS software by providing thematic maps for the last eleven years (2008-2019). Here, we demarcated the study area considering the boundary of an administrative unit named Wattala. By 2019, Muthurajawela marsh has lost 35% of its wetland habitats in 2008. The area with the lowest loss of wetland habitats (35.5 ha loss) was Mahapamunugama with the least number of flood events (2) as well as a lower number of people affected (725). Conversely, the highest number of people affected (46,951) and the highest number of flood events (19) were reported in Kerawalapitiya where the wetland experienced the most severe loss of wetland habitats (86.7 ha loss). A rapid assessment of the social values of Ecosystem Services (ES) was carried out in both areas through a questionnaire survey. This assessment aimed at investigating how much ecosystem services help to strengthen the wellbeing of the local community in reality. Nineteen ecosystem services were apparent including the value of being a cultural heritage, aesthetic value, noise and visual buffering, providing habitats for biota and regulating the local climate in Mahapamunugama where the wetland is comparatively healthy and the communities were of high resilience. In contrast, where the wetland is highly disturbed (Kerawalapitiya), the number of ecosystem services provided was only eleven with lower mean social values. The results of the present study highlight the importance of the health of wetlands in flood attenuation and increased community resilience as a result of ecosystem services they provide to the residents.

Keywords: Ecosystem based disaster risk reduction (Eco-DRR), Ecosystem Services, Flood mitigating role of wetlands