

Understanding the effects of degradation of the local mangrove ecosystem for a coastal transition state community in Sri Lanka

Jung Julia¹, Fathima Mafaziya Nijamdeen Thanne Walawwe Gedera^{2,3}, Rubiera Rodriguez Servane², Hugé Jean^{2,4,5,6}, Dahdouh-Guebas Farid^{2,5} and Berardi Andrea⁷

¹ Laboratory of Aquaculture & Artemia Reference Center, Ghent University, Coupure Links 653, Gebouw F, 9000 Ghent, Belgium
E-mail: JJEduOcean@gmail.com

² Laboratory of Systems Ecology and Resource Management, Département de Biologie des Organismes, Université Libre de Bruxelles (ULB), Avenue F.D. Roosevelt 50, CPi 264/1, 1050, Brussels, Belgium

³ Department of Biological Sciences, Faculty of Applied Sciences, South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka

⁴ Open University of the Netherlands, Valkenburgerweg 177, 6419AT, Heerlen, the Netherlands

⁵ Ecology & Biodiversity, Laboratory of Plant Biology and Nature Management, Biology Department, Vrije Universiteit Brussel (VUB), Pleinlaan 2, VUB-APNA-WE, 1050, Brussels, Belgium

⁶ Belgium Centre for Environmental Science, Hasselt University, 3500 Hasselt, Belgium

⁷ Engineering and Innovation, The Open University, Walton Hall, Milton Keynes MK7 6AA, UK

Local coastal communities in the global South often strongly depend on mangrove ecosystems due to the array of ecosystem services they provide. We present a mixed methods interdisciplinary study of the changing relationship within the local community in Oluvil, Southeastern Sri Lanka, and the adjacent mangrove ecosystem over the last 20 years. A total of 25 ethnobiological questionnaires about mangrove use and perception, and 35 in-depth interviews with a broader focus on the changes in the coastal environment were conducted. Most of the original mangrove ecosystem has been lost in the last 20 years due to soil erosion, increased wave action, deforestation and coastal development. Mangroves are perceived as an important part of the local ecosystem especially by fishermen, who reported important changes in fish abundance. High local dependence on mangrove firewood and the existence of culturally important mangrove-derived food items were also mentioned. Oluvil was identified as a community in transition, a community whose connection to nature is both impacted by traditional utilitarian and modern recreational uses and values. Mangroves were perceived to have a low resilience towards sea level rise and erosion, and reforestation efforts were not seen as a promising way to stop the ongoing erosion. Even though, people were aware of the mangrove degradation, its loss was not perceived as more important than the concurrent loss of large stretches of the beach and the previously existing river delta. These findings call for the consideration of changes in the social and ecological aspects of social-ecological systems, beyond the mere assessment of ecosystem services use. This can provide an improved understanding of the framing of mangrove ecosystem services and vulnerabilities. Furthermore, this approach contributes to a more holistic view of coastal management.

Keywords: Ecosystem services; Socio-ecological systems; Social-ecological transition; Community; Coastal development; Mangroves; Sri Lanka