



Spatial and Tidal-Zone Distribution of Abandoned, Lost, and Discarded Fishing Gear (ALDFG) Along the selected Northern to Southwestern Coast of Sri Lanka

S.N. Ranathunge, P.H.G. Nirupama, S.R.D.G. Herath, P.M.S. Hansika, R.M.O. Dilthara, R.M.S.K. Rathnayake, H.M.R.L. Herath, D.M.A.M.S.R. Andradi, K.L.T.D. Keerthirathna, H.V.M. Madushanka and M.G.Y.L. Mahagamage*

Centre for Environmental Studies & Sustainable Development, The Open University of Sri Lanka, Nawala, Sri Lanka

*mgyma@ou.ac.lk

Abandoned, lost, and discarded fishing gear (ALDFG) is a major component of marine debris that threatens coastal ecosystems through habitat degradation, pollution, and impacts on marine biodiversity. However, information on the spatial distribution and tidal-zone variation of ALDFG along the Sri Lankan coastline remains limited. This study investigated the occurrence and distribution of ALDFG at 21 sampling locations along the northern, northwestern, western, and southwestern coast of Sri Lanka. Field surveys were conducted from March to April 2026 using a 10 m × 1 m interrupted belt transect across low, mid, and high tidal zones. Triplicate 1 m² quadrats were sampled within each tidal zone to quantify ALDFG abundance. Among all sampling locations, a total of 698 ALDFG pieces were recorded, with macro - sized debris (>2.5 cm) comprising the dominant fraction, accounting for 80.52% of the total. ALDFG abundance increased from the low tide zone to the high tide zone. Kalpitiya recorded the highest overall ALDFG abundance (21.34%), whereas no ALDFG was detected at Kilikarayanpiddi and Dungalpitiya. Four major ALDFG categories were identified: ropes, fishing lines, fishery-related foam materials, and nets. Ropes accounted for the highest proportion of total ALDFG items (58.90%), while nets recorded the lowest abundance (4.87%). The highest abundances of nets and foam materials were recorded at Moratuwa, while fishing lines were most abundant at Mampuri (2.33 ± 1.88 items m⁻²). Ropes showed the maximum abundance at Kalpitiya (18.83 ± 13.43 items m⁻²). Kruskal–Wallis analysis confirmed significant spatial and tidal-zone variations in ALDFG abundance, indicating a non-uniform distribution pattern along the coastline. These findings underscore the urgent need for gear retrieval programmes, port-based disposal infrastructure, fisher awareness initiatives, and systematic long-term monitoring of high-risk coastal zones in Sri Lanka.

Keywords: *ALDFG, Coastal monitoring, Coastal pollution, Marine debris, Tidal-zone variation*