



## Development and Application of a Multi-Dimensional Sustainability Index for Evaluating Gill Net Fisheries in Small-Scale Fisheries of Southern Sri Lanka

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Small-scale fisheries (SSF) are vital for coastal livelihoods and food security in Sri Lanka; however, existing sustainability assessment frameworks are largely designed for industrial fisheries and do not adequately address the ecological, economic, and social dimensions of SSF. Sri Lanka also lacks a localized framework for evaluating fishing gear sustainability. Therefore, this study developed and applied a multi-dimensional sustainability index to assess the sustainability of gill net fisheries in Southern Sri Lanka. The index was developed by integrating the Métier-sustainability-index (MSI25), FAO fisheries sustainability guidelines, and locally relevant fisheries characteristics identified through field investigations. The framework comprised three sustainability pillars: environmental, economic, and social, each containing five indicators. Indicator thresholds were defined using MSI25 benchmarks, pilot survey results, and contextual adjustments to ensure relevance to Sri Lankan small-scale fisheries. Indicators were categorized into three performance levels; sustainable, under pressure, and unsustainable, using a colour-coded system. Equal weighting was applied to all indicators. The study was conducted at five coastal landing sites in Hambantota District; Kottegoda, Kudawella, Mawella, Tangalle, and Kalametiya. A preliminary survey of approximately 400 fishers identified ten major gill net categories. The frigate tuna gill net was selected for detailed assessment due to its high prevalence. Structured face-to-face interviews were conducted with 250 (n = 250) fishers between November 2024 and January 2025. Results showed low sustainability across all pillars; ecological (15.72%), economic (29.14%), and social (6.10%). These findings indicate that the fishery operates under significant sustainability pressure. The developed index provides a preliminary framework for evaluating small-scale fishing gear sustainability in Sri Lanka and may support evidence-based fisheries management. Further validation across different fisheries and regions is recommended to improve its robustness and applicability.

**Keywords:** *Small-scale fisheries (SSF), Sustainability index, Gill net fisheries, Fisheries management, Multi-dimensional assessment, Sri Lanka*