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Blue carbon management integrating socioeconomic and environmental interconnectivity in Southeast Asia: an urgent climate priority

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This perspective article synthesises insights from a 2023 interdisciplinary workshop in Kuching, Malaysia, where 26 experts examined how land use and land cover change (LULCC) impacts Blue Carbon Ecosystems (BCE) in Southeast Asia (SEA) and identified pathways for integrated, science-informed governance. BCE in SEA (mangroves, seagrasses and tidal wetlands) are globally significant carbon sinks, critical to biodiversity and the livelihoods of millions, dependant on them for food, income and coastal protection. Yet rapid development and socio-economically driven LULCC threaten BCE resilience and carbon storage capacity. Blue Carbon initiatives risk falling short if they overlook the socio-ecological interconnectivity of these systems. Advances in remote sensing, sediment carbon accounting and ecosystem modelling have improved BCE monitoring, but key gaps persist. These include understanding cumulative upstream effects of LULCC on BCE carbon dynamics, integrating socio-economic with ecological data for robust scenario modelling and evaluating governance effectiveness and equity over time. We frame BCE as dynamic, interconnected socio-ecological systems and call for the advancement of systems thinking in coastal and climate policy. We underscore the need for