



INDONESIA DISSERTATION/THESIS PROJECT

IN41 Role of seagrass beds in the Wakatobi marine ecosystem

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Seagrass meadows are a major feature of the Wakatobi National Park (WNP) that constitute a large proportion of marine habitat and harbour a diverse array of fauna. Seagrasses are angiosperms (flowering plants) that form dense meadows in shallow coastal waters, with leaves and roots produced via rhizome extension. Within Indonesia, 14 floral seagrass species have been identified, although meadows are typically dominated by three to four species. Around Hoga, 8 species have so far been identified, making these seagrass beds of particular interest and importance. Despite their recognized importance, seagrass ecosystems in the WNP remain poorly understood.

Acting as a vital part of the marine ecosystem due to their productivity, structural complexity, and biodiversity, seagrasses provide food, habitat, and essential nursery areas for a multitude of organisms. In the WNP seagrass habitats provide shelter to over 180 species of fish. Many of these species complete daily migrations to coral and mangrove habitats, forming a complex and connected ecosystem. Additionally, seagrasses provide habitat to infaunal and epiphytic organisms such as sponges, bryozoans, foraminifera, and other taxa that contribute to local food webs. Seagrass meadows also provide a variety of economic services such as filtering land-based nutrients, increasing water clarity, and protecting coastlines by stabilizing silt and sediment.

High rates of seagrass loss has been documented worldwide, typically associated with coastal development, nutrient run-off, dredging, propeller scarring, and sedimentation. In the WNP, however, seagrass meadows are most heavily utilized as a fisheries resource through direct fishing and the gleaning of invertebrates for subsistence and commercial export. The practice of cultivating marine algae for agar in shallow seagrass meadows is also of growing concern due to decreases in available light and subsequent reductions in plant biomass. Local populations in the WNP are dependent on marine resources, yet the seagrass-associated fishery is overexploited, unmanaged, and the consequential ecological impacts have received little attention.

Data collection for this project will rely on snorkelling and low tide surveys due to the shallow nature of seagrass meadows. The specific data collected will vary depending on the dissertation being carried out. Attractive studies would focus on seagrass meadow community structure and standing biomass, as well as associated biodiversity and fish biomass. There is also a need to understand the diversity and ecological role of invertebrate communities in seagrass meadows as these species are at risk of overexploitation. Finally, fish migration between coral reefs, mangroves, and seagrass meadows require further investigation and projects could explore the role of local seagrass beds as nursery grounds for fish.

Recommended Reading

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