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Success of Hands-On Practices of the Local Community Involving Sea Turtle Conservation in the Southern Coast of Sri Lanka

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Abstract

The marine reptiles (sea turtles) are under threat worldwide, presumably due to environmental pollution, habitat fragmentations, coastal developments, and predator pressure. The ex-situ conservation site was established at Midigama, adjacent to the in-situ site, to study survival and effectiveness of the conservation process while minimizing predator pressure and anthropogenic pressure on the eggs and nests. Through the night patrol, which involved collecting and incubating eggs in an ex-situ site under a proper shade area, the depth of the hatchery nest dug at the ex-situ site was 35 (± 2.50) cm, and the widest point of diameter was 14 (± 2.00) cm. In particular, sand taken from the nest was deposited and coated on the wall of the hatchery nest before the eggs were laid. Nests were protected from possible predators until the hatchlings were ready for release. Furthermore, the number of survival and mortality of hatchlings were recorded over nesting seasons (December–April) for three years (2022–2024). Recorded all species was Olive Ridley Sea turtle (*Lepidochelys olivacea*), and average number of eggs was 120 ± 4.35 per individual. Results indicated hatchling survival rates of 94%, 92%, and 87.7%, respectively, in 2022, 2023, and 2024. A significantly higher percentage highlighted the effectiveness of these conservation strategies in mitigating threats to hatchling survival. An increasing trend was observed in the estimated number of nests, eggs, and live hatchlings, further supporting the success of the conservation initiatives. The ANOVA analysis highlighted there was a significant difference between survival rates and total number of live hatchlings ($p < 0.05$) in three different years. Notably, the integration of indigenous knowledge from the local community, from re-nesting of eggs to live hatchling release, played a key role in the success of the conservation efforts. The study underscores the importance of involvement of the coastal communities and the related institutes in sea turtle conservation and the need for developments of ex-situ conservation strategies. The available data and biological knowledge suggest that ex-situ conservation efforts may have contributed significantly to the conservation of sea turtles nesting in Midigama Beach; that increase is not only of regional importance but also of significance at the global level.

Keywords: *Olive ridley turtle, Ex-situ conservation, Hatchling survival rates, Anthropogenic pressure, Survival rates, Coastal communities*