A leading-edge field research station in Raja Ampat

Raja Ampat (RA), which literally means 'Four Kings' in Bahasa Indonesia, is one of the most beautiful archipelagos in the world. Located off the western tip of New Guinea at the heart of the Coral Triangle, RA boasts 69% of the world's stony coral species, 27% of the planet's coral reef fishes, and 10% of the Earth's known mantis shrimp species. Furthermore, the islands are home to lush rainforests that harbor a wide range of freshwater and terrestrial mollusks; arthropods; and vertebrates, including 40% of New Guinea's bird species (8 of which belong to the stunning 'Bird of Paradise' family) and a cornucopia of amphibians, reptiles, and mammals. The sheer beauty, abundance and diversity of life exhibited by RA has not gone unnoticed. Prior to the covid pandemic, the number of visitors had jumped from 998 in 2007 to 29,653 in 2016[1]. While this astonishing expansion brings new economic opportunities to the region, the negative effects of this growth on the area's biodiversity and local communities (their culture, food and the other natural resources upon which they depend) remain uncertain.

Given the staggering biodiversity found in the Four Kings, a wide range of stakeholders recognize the enormous value of this little corner of the planet. There are countless species to be discovered, ecological and evolutionary processes to be deciphered, and animal behavior to be described. More amazingly, RA's coral reefs have displayed a superb resilience to human pressure, perhaps holding the keys to the restoration of coral reefs elsewhere across the Indo-Pacific while setting the standard for how reefs should look like in the future. As the risks of climate change and ocean acidification intensify, elucidating the reasons for RA's resilience is an urgent scientific priority. With the rapid growth in tourism, more effective ways to manage forests and fisheries, to the benefit of local communities, need to be explored and implemented. Thus, RA's relatively pristine condition and expanding human pressure call for the establishment of a strategically-located, well-funded, world-class biological field research station. A 2002 report explicitly suggested the creation of such a center where a wide range of activities would take place, including leading edge research; conservation initiatives; education and outreach (e.g., engaging children, parents, and local communities in citizen science projects, training of local youth in scuba diving, teaching Indonesian high-school and university students basic ecology, providing research facilities to local faculty); coordination of research activities between national and international investigators; and training of NGO and Indonesian government officials to work together for the protection of RA[2].

Currently, there are only a handful of facilities in RA whence scientists have carried out surveys and basic research. Each is attached to an eco-resort but lacks the necessary equipment, laboratories, space and trained personnel to conduct the activities mentioned above. For instance, for StAR, an on-going project that intends to reintroduce zebra sharks (*Stegostoma tigrinum*) to the Bird's Head Seascape[3], two of the existing facilities were selected and at each a hatchery was built to incubate zebra shark eggs sourced from overseas. Hiring and training of local hatchery aquarists was conducted in Jakarta, far from RA. Clearly, a leading-edge field research station would ease such reintroductions and benefit the archipelago and its people greatly. The station should provide comfortable, affordable room and board for investigators and students. Ideally, it should possess a modern library with computers, maps, field guides, and access to scientific literature; wifi; fully equipped dry and wet labs; modern research equipment to carry out surveys on land and in the sea; a diving center; office space with desks and laptops; meeting rooms; conference space; boats; transport to and from Waisai or Sorong as needed; and a small museum and/or interpretation center. The station would reduce transportation costs for researchers who would otherwise have to carry heavy equipment back and forth. The center should strive to be carbon neutral or negative by using solar, wind, and wave energy to power all its operations, including diving. An ideal diving center would only use renewable energy to fill up air tanks, pump fresh water (if needed) to maintain equipment clean, and even develop and exclusively use dive and transportation boats powered by renewable energy. Partnership with a leading US or European institution interested in sustainability, carbon negative design engineering, green energy and architecture, conservation of biodiversity, and basic research can make this biological field station a reality.

References

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3. Shimlock, M. and M.V. Erdmann. 2022. *StAR Project: Reintroducing Zebra Sharks to the BHS*. Bird's Head Seascape. Accessed July 2022. https://birdsheadseascape.com/conservation-science/star-project-reintroducing-zebra-sharks-to-the-bhs-by-maurine-shimlock-with-project-updates-by-dr-mark-erdmann/