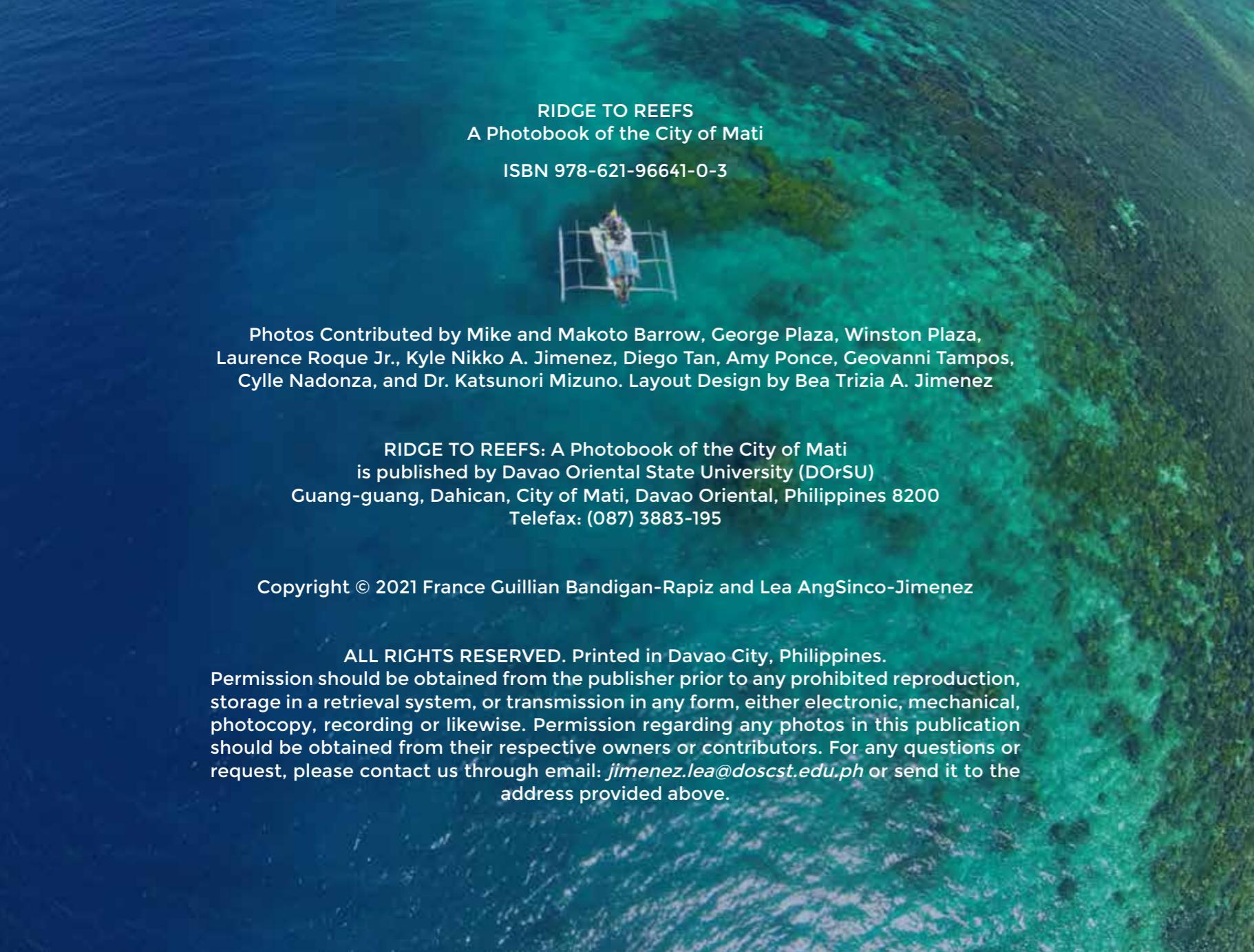


RIDGE TO REFS



A PHOTobook OF THE CITY OF MATI

FRANCE GUILIAN BANDIGAN-RAPIZ & LEA ANGSINCO-JIMENEZ



RIDGE TO REEFS
A Photobook of the City of Mati

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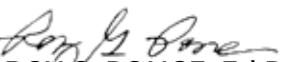
FOREWORD

The Davao Oriental State University (DOrSU) is at the forefront of natural resources management in the City of Mati. It played the role of an academic steward, advancing cutting-edge research and scientific pursuits that aim to protect and conserve the City's rich biodiversity and pristine natural heritage from ridge to reef. Over the years, the University served as a vanguard of Mt. Hamiguitan Range Wildlife Sanctuary (MHRWS), the first World Heritage Site in Mindanao inscribed by the United Nations Educational, Scientific, and Cultural Organization (UNESCO), as well as the Pujada, Mayo, and Balete Bays that have been listed under Most Beautiful Bays of the World (MBBW).

This photobook by Engr. France Guillan B. Rapiz and Dr. Lea A. Jimenez is a forward-thinking initiative to sustain the University's mission of educating the local and international communities on the importance of environmental development. On the one hand, this material raises local awareness and appreciation of natural heritage, which has been limited to the educated community for a long time. The end goal is to introduce the City's beauty across social classes. In addition, this demonstrates the significance of the ridge to reef resources through international boundaries, thereby fostering global cooperation.

As a newly-converted University, DOrSU takes on the challenge to continue directing its energies on sustainability and regenerative science. The administration ensures that enabling mechanisms are put in place so its human capital may continue advocating for the environment. Much is owed to the persistent efforts of the University's research, development, and extension (RDE) forerunners, such as Engr. Rapiz and Dr. Jimenez. Hoping that this effort is an inspiration within and outside the academe to recruit more think tanks and leg workers for the City's natural endowments and treasures.

Hiraya manawari!


(Sgd.) ROY G. PONCE, Ed.D.
SUC President III

FROM RIDGE TO REEFS

The core concept of ridge-to-reefs typically refers to a natural resource management approach that utilizes the “whole of ecosystem” concept. This strategy integrates management schemes for interconnected terrestrial and marine ecosystems and seeks to govern the natural and social systems holistically. This approach recognizes that while the boundary between terrestrial and marine environments is well-defined, socio-economic activities’ impacts transcend borders, both geographical and jurisdictional. This is even more so where the myriad interests of many users result in conflicts in allocating scarce resources.

Previously, the management of natural resources was sectoral in approach, and this has been found to exacerbate the environmental problems they aim to address rather than present long-term solutions. However, recent reviews on best practices in coastal management point to a better, more innovative approach to resolving the complexity of issues through an ecosystem-based system.

Applying the integrated management approach aims to alleviate similar issues of resource degradation, climate change, food insecurity, and poverty, to name a few, by creating a governance system that allows for the management of multiple uses in an integrated way. Ultimately, it aims to achieve most, if not all, of the sustainable development goals.

The City of Mati is endowed with diverse natural resources from ridge to reefs, a significant percentage of which are even rare, endemic, and globally threatened. It would be a conservationist’s dream to preserve these natural wonders. A more pragmatic approach would also include harnessing the resources to drive economic progress and promote social equity and so realize sustainable development.



CONTENTS



From Ridge to Reefs

[page 4](#)

Rich Resources from Ridge to Reefs

[page 7](#)

Location Map of City of Mati

[page 8](#)



Mount Hamiguitan Range Wildlife Sanctuary

[page 12](#)

Pujada Bay Landscape and Seascapes

[page 18](#)

Dahican Beach & Mayo Bay

[page 24](#)



Looking Forward to the Future

[page 42](#)

Regional Integrated Coastal Resource Management Center - Region XI

[page 48](#)

References

[page 50](#)

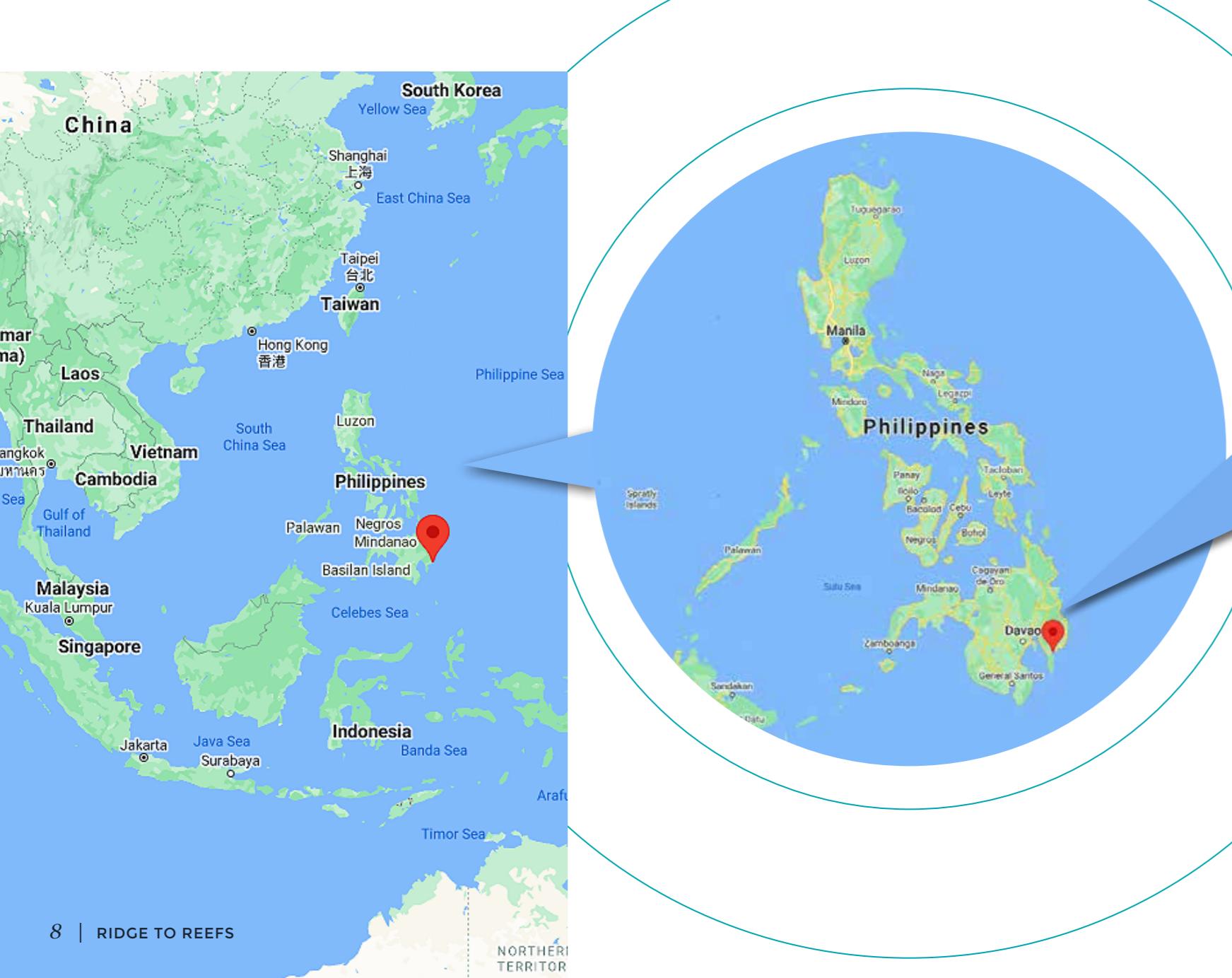


RICH RESOURCES FROM RIDGE TO REEFS

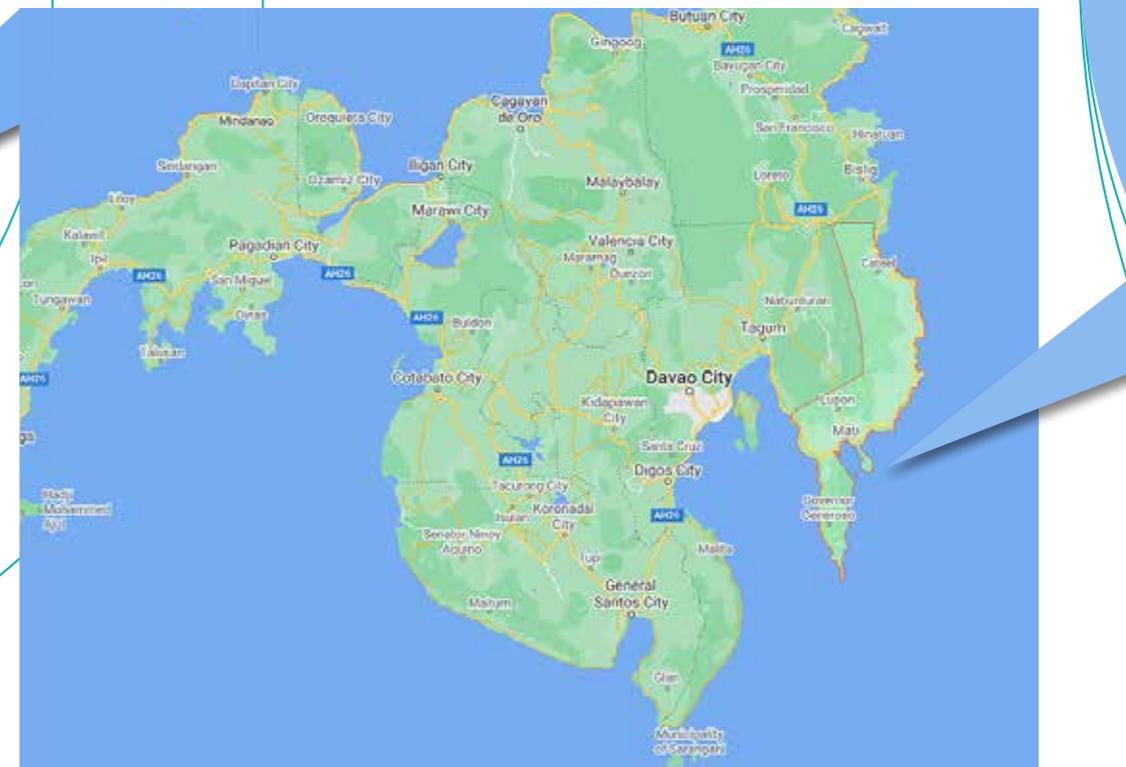
Straddling the southeastern coast of Mindanao Island, the Province of Davao Oriental is an epitome of natural wealth, from ridge to reefs. Municipalities along its eastern seaboard face the vastness of the Pacific Ocean. To the west, the Province lies against the Mount Puting Bato-Kampalili-Mayo complex, rugged mountain ranges shared with Davao de Oro and which form part of the Eastern Mindanao Biodiversity Corridor. The Agusan del Sur and Surigao del Sur provinces hem Davao Oriental to the north and its southernmost tip opens to Davao Gulf and the Celebes Sea.

The richness of the province's resources has never been more so exemplified than in its capital, the City of Mati, nestled in Davao Oriental's southern end. Hosting a veritable melting pot of a sundry biota, from the highest peak of its mountain ranges to the coral reefs in the depths of its acclaimed bays, the City of Mati is undoubtedly the crowning jewel of the Province.





LOCATION MAP OF CITY OF MATI, DAVAO ORIENTAL



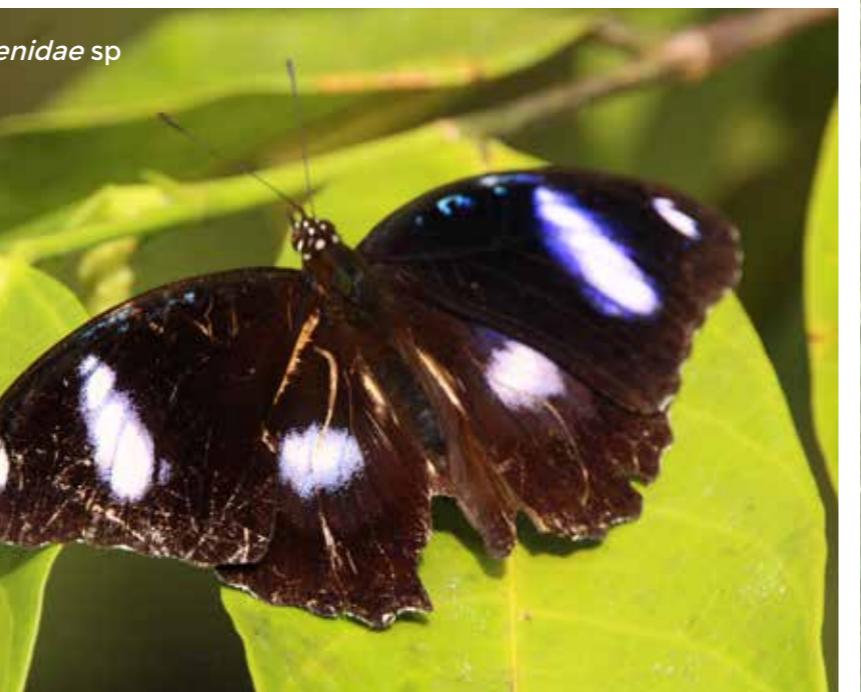


MT. HAMIGUITAN RANGE WILDLIFE SANCTUARY

The city shares the famed Mount Hamiguitan Range Wildlife Sanctuary (MHRWS) with its sister municipalities – San Isidro and Governor Generoso, both within the jurisdiction of Davao Oriental. MHRWS in the southeastern portion of the Eastern Mindanao Biodiversity Corridor was established as a protected area under the National Integrated Protected Area System through Republic Act 9303 on July 30, 2004. Inclusive of its buffer zone, MHRWS covers a total of 6,834.00 hectares, climbing to 1,637 meters above sea level (masl) at its highest peak over the Pujada peninsula, overlooking the Pacific Ocean to the east and Davao Gulf to the west.

Owing to the diversity of flora and fauna it hosts, the MHRWS was inscribed in the prestigious UNESCO World Heritage List in June 2014ⁱ, the 6th site in the Philippines and the first and so far only one from Mindanao to be given the distinction. In October of 2014^j, it was also added to the roster of ASEAN Heritage Parks^k.

A study conducted by the Philippine Eagle Foundationⁱⁱ in 2004 and 2005 revealed that 108 bird species (46 of which are Philippine endemics), 35 species of frogs and reptiles (28 Philippine endemics), and 32 species of mammals (17 Philippine endemics) are found in Mt. Hamiguitan. Most notable among these are the following: *Cacatua haematuropygia* (Philippine cockatoo), *Gallicolumba criniger* (Mindanao bleeding heart), *Gorsachius goisagi* (Japanese night heron), *Pithecophaga jefferyi* (Philippine eagle), and *Podogymnura truei* (Mindanao gymnure).



Grey Faced Buzzard



Idea leuconoe obscura
(Paper Kite Butterfly)



Rufous Tailed Jungle Flycatcher



Amethyst Brown Dove



Ruddy Kingfisher



Pachyrhynchus sp
(Weevil)



Black Nape Monarch



Spangled Drongo





Lanius cristatus
(Brown Shrike)



Cyanoptila cyanomelana
(Blue and White Flycatcher)



Halcyon gularis
(Brown-breasted Kingfisher)

PUJADA BAY

Landscape and Seascapes

The City of Mati's untold riches lie in the invaluable biodiversity of its natural resources, from its varied habitats to the profusion of species these host. The city boasts of mountain ranges teeming with rare wildlife, wetlands that offer refuge to migrating birds, watersheds that supply purified water to downstream communities, riverine habitats, fertile agricultural plains, sweeping coasts, world-class beaches, buttressing mangrove forests, verdant seagrass meadows, and pristine coral reefs, among many others.

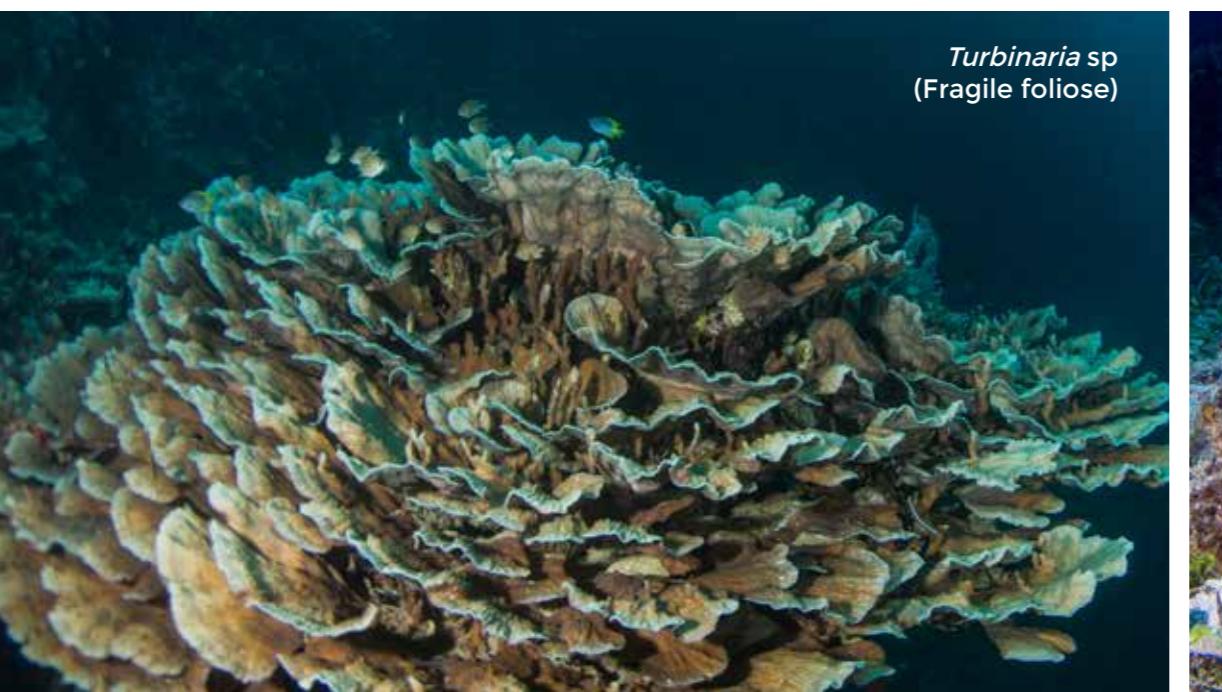
Flanked by the Pujada Peninsula to the left and Guang-guang peninsula to the right, Pujada Bay encloses 21,200 hectares of protected landscape and seascapes under the National Integrated Protected Area System (NIPAS) declared through Presidential Proclamation 431 in 1994. Pujada Bay abuts the marine biodiversity corridor that is the Philippine Sea, where the Pacific Ocean and the Celebes Sea converge. In October 2019, along with the smaller Balete Bay and the adjacent Mayo Bay, Pujada Bay was named as one of the "Most Beautiful Bays in the World" (MBBW)^{IV}; the only other Bay in the Philippines to make the highly-esteemed list was Puerto Galera Bay.

The U-shape coast of the Bay and the three small islands - Pujada, Waniban, and Oak - standing guard at its opening are fringed with coral reefs. The extensive seagrass meadows, especially near the mouth of the Bay, are frequented by foraging dugongs. Lining up the inner shoreline of Guang-guang peninsula is more than 200 hectares of mangrove forest forming a dense canopy. The enclosed shape of the Bay affords it protection even during the northeast monsoon (amihan) season, and tourists can enjoy tranquil and crystalline turquoise water all year round, making it an ideal destination for beachgoers.





Spoon seagrass or Dugong
grass and Dugong trails



DAHICAN BEACH & MAYO BAY: Sun, Sand, Sea & Surf

The white sand beach and rolling waves would have been more than enough to train the tourism spotlight on Dahican Beach. Indeed, it is fast becoming one of the favorite destinations of surfers and skimboarders, not just from southern Mindanao but throughout the Philippines, even from outside the country. Dahican, however, has so much more to offer.

In the lull of the southwest monsoon (habagat) season, locals have reported whale shark (*Rhincodon typus*) encounters. Their presence has been confirmed through a survey conducted by RIC XI in 2013^v; these friendly giants follow schools of bolinao or anchovies driven towards shallower water by the current. Boat surveys made by RIC-XI in 2013 recorded pods of Pantropical spotted dolphins (*Stenella attenuata*) and spinner dolphins (*Stenella longirostris*) farther from the coast. Regular visitors to the Dahican coast include five species of marine turtles; Olive Ridley - *Lepidochelys olivacea*, Green Sea - *Chelonia mydas*, Loggerhead - *Carreta carreta*, and Hawksbill - *Eretmochelys imbricata*, a critically endangered species, and Leatherback - *Dermochelys coriacea* (DENR-XI, CEPMO Report).

Furthermore, a number of the critically endangered dugong (*Dugong dugon*) are considered to be residents of the Bay. In addition, anecdotal reports added other species such as the pilot whale to the possible aggregation of cetaceans that use Dahican as part of their migratory route. This should come as no surprise as a 2001 study by Licuanan and others^{vi} discovered an upwelling in the Philippines' eastern seaboard.







A baby *Dugong dugon* (Dugong) playing nearshore areas in Mayo Bay







Rhincodon typus
(Whale shark)





Stenella attenuata
(Pantropical Spotted Dolphin)



Tursiops truncatus
(Common Bottlenose Dolphin)



Stenella longirostris
(Spinner Dolphin)



Oarfish
(Serpent fish)



Rhinobatos sp
(Common Guitar fish)



LOOKING FORWARD TO THE FUTURE:

Facing Development Challenges and Value Strengthening of Eco-system-based Management Initiatives

The City of Mati has indeed been singularly blessed, and the prospects this signify are well-appreciated by its local leaders and its citizenry. Rightfully so, the City of Mati has earned for itself a place in the world's eco-tourism map with Mt Hamiguitan - both a UNESCO World Heritage and ASEAN Heritage site. Furthermore, the Pujada, Mayo, and Balete Bays qualify to the coveted World's Most Beautiful Bays (MBBW) list with their intrinsic values.

Nonetheless, the people of Mati would do well not to rest on their laurels, as the next steps would be far more grueling. Now that travelers from across the globe would know of the immense wonders the City of Mati has to offer, how can the protection of these natural assets be guaranteed so that they continue to be providential for its populace? The answer lies in the sustainable development of these resources - a development that aims to hit the triple bottom line of economic prosperity, social equitability, and environmental integrity to provide for the needs of present and future generations.

The city's local leaders are mindful of the challenges. They are meeting them head-on by strategizing the city's development around the sustainability of its eco-tourism sector and other growth potentials like agro-industry. Ecotourism, among all sectors, is perhaps in the best position to play a most significant role in sustainable development. An expansion of this sector would infuse much-needed economic stimulus by generating revenues and spurring crucial physical infrastructures. Unfortunately, the possibilities are relatively under-tapped.

But while there is tremendous promise for developing tourism in the City of Mati, there is also the daunting risk of such development's detrimental impacts on an inherently fragile environment. Moreover, this is an issue that is not unique to the City of Mati. Fortunately, similar issues have elsewhere been addressed such that lessons learned and best practices in the sector can guide our planners and managers in formulating a strategic framework plan that will steer the city's ecotourism sector towards a more imperishable future.

One initiative is the user fees principle. The Regional Integrated Coastal Resource Management (ICRM) Center - Region XI (RIC XI) conducted studies in 2013 that revealed tourists' willingness to pay an environmental fee to fund conservation and effective management of natural resources^{VII}. The studies were conducted in three of the City of Mati's most popular destinations: Mount Hamiguitan Wildlife Range Sanctuary, Pujada Bay Protected Landscape, and Seascape, and Dahican Beach.

Different users expectedly ascribed different values to natural wealth; on the whole, however, tourists would indeed want to contribute even just a nominal fee to pay for their use of environmental goods and services and maintain it for others to benefit from as well. An equally crucial finding of the study is the importance of embedding information and education campaigns (IEC) into tourism; thus people need to be informed so that they accord a higher sense of value to the natural capital and perceive the urgency of committing to the sustainability of this sector.

Batang dagat: Future vanguards of embayments (Pujada, Mayo and Balete Bays) of the City of Mati





Children of the sea:
The hope of our marine environment



Coastal communities protecting
our marine wildlife



Amihan sa Dahican with local, regional, national and international partners for conservation and protection of embayments of the City of Mati



The boys and girls of Amihan sa Dahican:
The great champions for marine conservation
and protection in the City of Mati

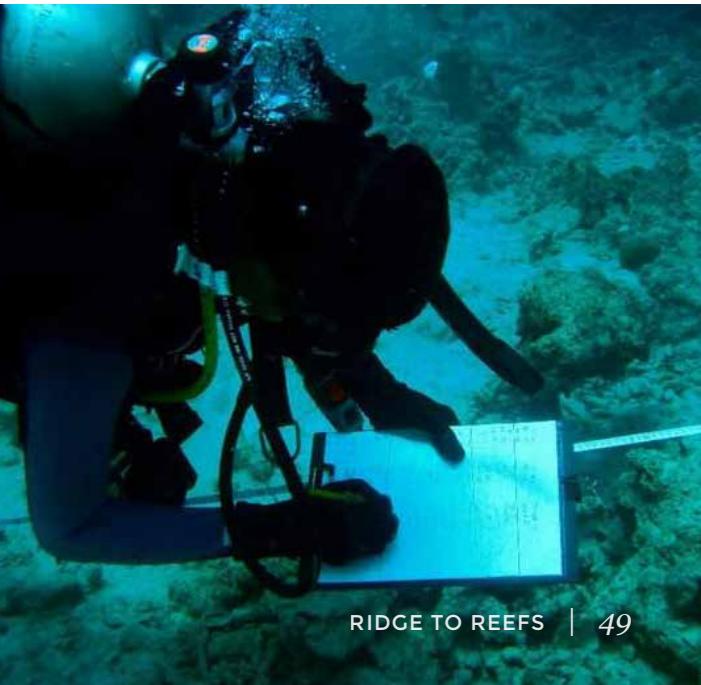
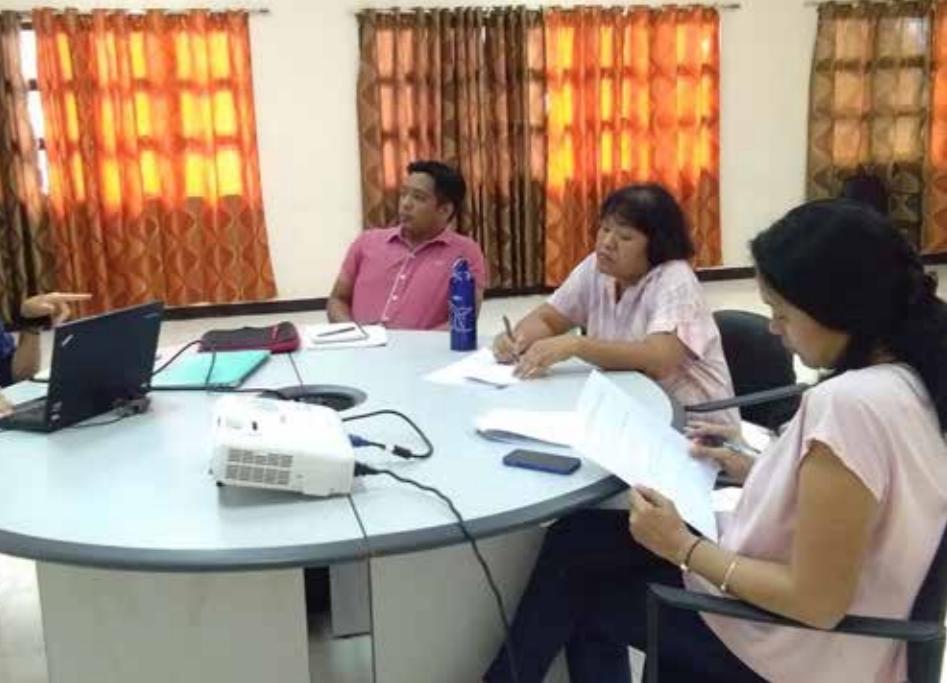
REGIONAL INTEGRATED COASTAL RESOURCE MANAGEMENT CENTER – REGION XI

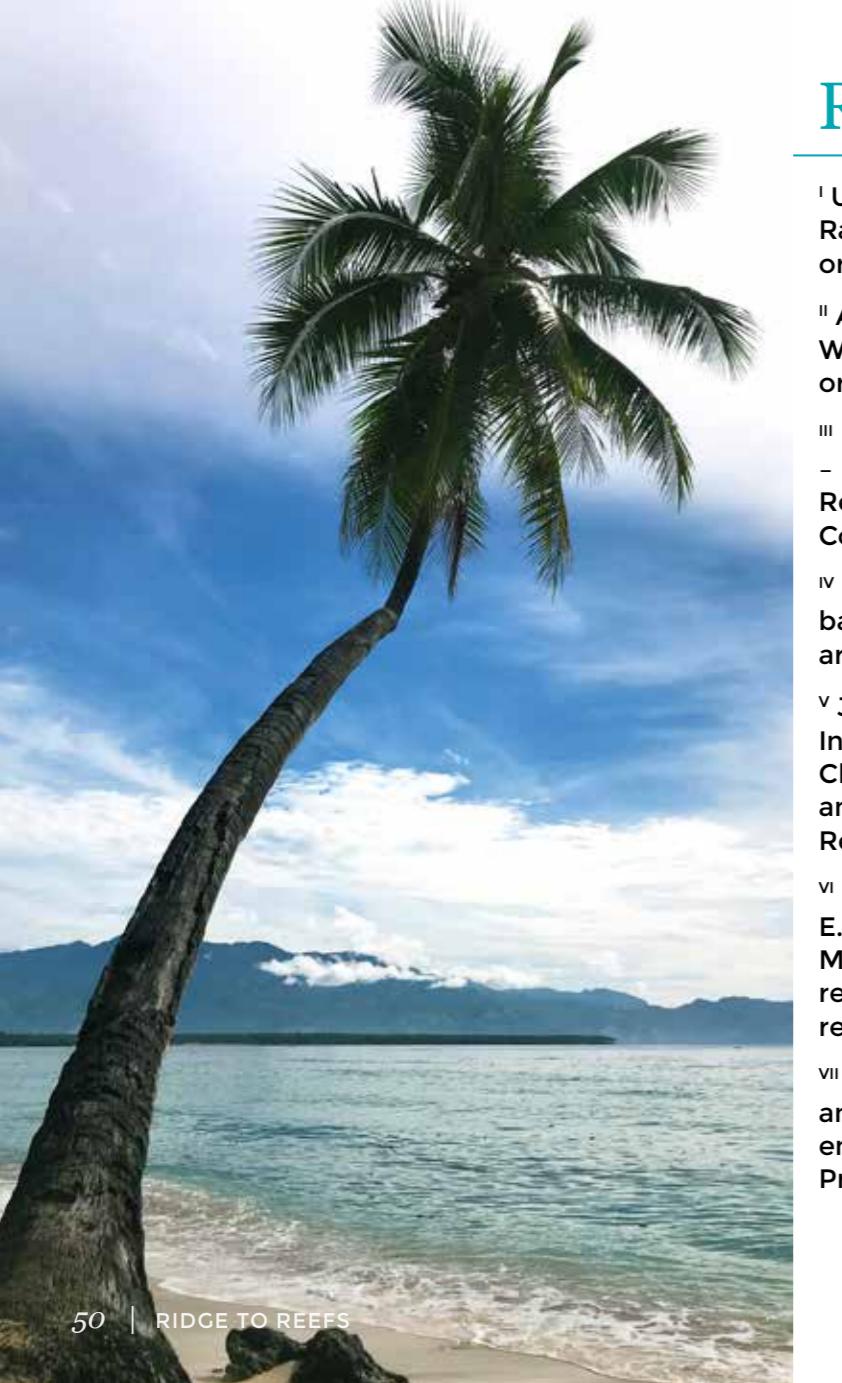
The Regional Integrated Coastal Resource Management Center - Region XI (RIC-XI) was established in 2009 with funding from the Department of Environment and Natural Resource (DENR) under the auspices of the Asian Development Bank (ADB).

Through the assistance of the Silliman University (SU), the then-Davao Oriental State College of Science and Technology (DOSCST; now, the Davao Oriental State University- DOrSU) provided the workforce and physical infrastructure for the establishment of the center. During its inception and a couple of years following the RIC-XI initial operations, the DENR provided the center financial support for projects that adhered to the research plan initially identified for the ICRM Program.

The RIC XI was established to provide a hub for coastal and marine biodiversity monitoring and research, training, and demonstration activities and serves as a focal point for related information, education, and communication activities relevant to coastal resource management. In addition, it is committed to initiating research and associated activities that will promote the sustainable use of coastal and marine resources and inform the decision-making process relevant to the effective conservation and management of these resources. Initially, the RIC XI implemented the project entitled “Biodiversity Assessment Along the Pujada Bay Corridors for Marine Protected Area Management,” anchored on the research agenda identified by Silliman University for the implementation of DENR’s Integrated Coastal Resource Management Project in the Davao Region.

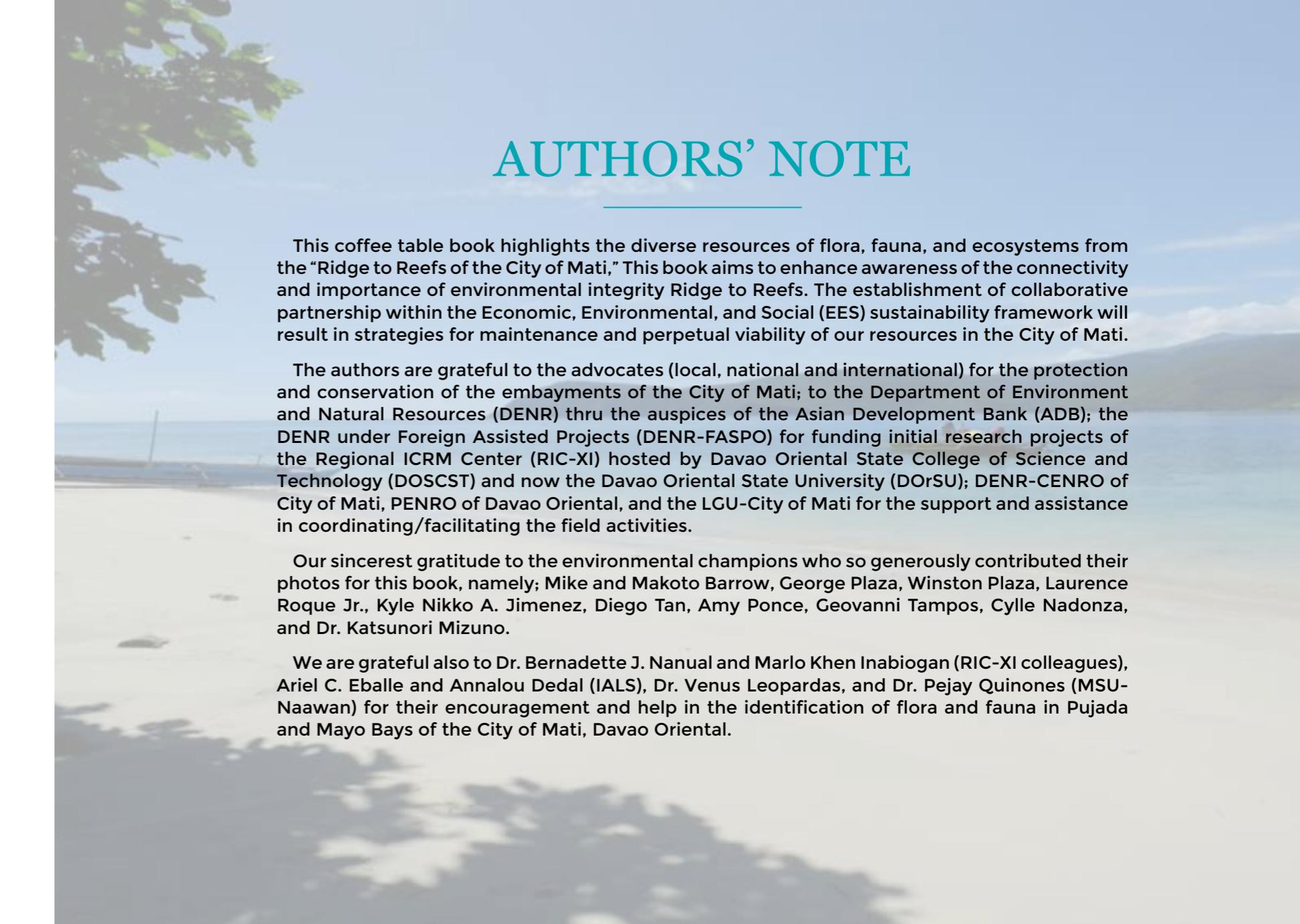
After completing the project in 2013, RIC-XI conducted four more projects with DENR under the Foreign-Assisted Projects (FASPO). This book is a product of one such project, entitled “Willingness to Pay and Perceptions of Tourists and Other Resource Users for the Environment and Natural Resources of Mati, Davao Oriental Province, Philippines.” Since completing the project activities in 2014, RIC-XI has continued to conduct research activities and projects that aim to benefit the coastal and marine environment and support faculty and student researchers alike in similar endeavors.





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AUTHORS' NOTE

This coffee table book highlights the diverse resources of flora, fauna, and ecosystems from the "Ridge to Reefs of the City of Mati." This book aims to enhance awareness of the connectivity and importance of environmental integrity Ridge to Reefs. The establishment of collaborative partnership within the Economic, Environmental, and Social (EES) sustainability framework will result in strategies for maintenance and perpetual viability of our resources in the City of Mati.

The authors are grateful to the advocates (local, national and international) for the protection and conservation of the embayments of the City of Mati; to the Department of Environment and Natural Resources (DENR) thru the auspices of the Asian Development Bank (ADB); the DENR under Foreign Assisted Projects (DENR-FASPO) for funding initial research projects of the Regional ICRM Center (RIC-XI) hosted by Davao Oriental State College of Science and Technology (DOSCST) and now the Davao Oriental State University (DOOrSU); DENR-CENRO of City of Mati, PENRO of Davao Oriental, and the LGU-City of Mati for the support and assistance in coordinating/facilitating the field activities.

Our sincerest gratitude to the environmental champions who so generously contributed their photos for this book, namely; Mike and Makoto Barrow, George Plaza, Winston Plaza, Laurence Roque Jr., Kyle Nikko A. Jimenez, Diego Tan, Amy Ponce, Geovanni Tampos, Cyille Nadonza, and Dr. Katsunori Mizuno.

We are grateful also to Dr. Bernadette J. Nanual and Marlo Khen Inabiogan (RIC-XI colleagues), Ariel C. Eballe and Annalou Dedal (IALS), Dr. Venus Leopardas, and Dr. Pejay Quinones (MSU-Naawan) for their encouragement and help in the identification of flora and fauna in Pujada and Mayo Bays of the City of Mati, Davao Oriental.

A wide-angle landscape photograph capturing a vast, scenic view. In the foreground, there's a dense growth of low-lying plants with vibrant red and orange leaves, some with long, thin, drooping flowers. Beyond the vegetation, a range of mountains is visible, their peaks partially obscured by a thick layer of white and grey clouds. To the right, a large, dark, silhouetted island or peninsula juts out into a body of water. The sky above is a deep, clear blue, dotted with wispy, white clouds.

RIDGE — TO — REEFS

PHOTOBOOK