BATANGAS STATE UNIVERSITY
The National Engineering University

BATSTATEU SUPPORTS SUSTAINABLE UTILIZATION OF OCEANS, SEAS, LAKES, RIVERS, AND MARINE RESOURCES

Addressing Food Security in Batangas, Philippines through Backyard Tilapia Farming

Rationale:

The COVID-19 pandemic demonstrated how lockdowns and road checkpoints complicate food delivery logistics. Due to long lines at checkpoints or lack of transportation, the goods for transport rot and perish (Pamplona, 2020). Additionally, communities from isolated towns were also limited to secure their food due to quarantine.

Small-scale backyard tilapia fishponds were set up, managed, and monitored for 15 beneficiaries in order to provide the nutritional needs of impoverished household in Batangas Province during the post-lockdown period. The majority of the recipients obtained harvests with high Feed Conversion Ratios after receiving sufficient training on good aquaculture methods. 4.5 tons of fresh tilapia were produced following two croppings. In order to make tilanggit and smoked tilapia after harvesting, a livelihood training program was also carried out.

General Objectives:

- To increase the household disposable income and provide immediate fish supply to poor households in Batangas

Specific Objectives:

- To introduce good aquaculture practices/technologies on tilapia production
- To enhance capabilities of tilapia farmers on culture and management practices
- To establish linkages with stakeholders and partner LGUs

Outputs:

Publications: One (1) manuscript on Tilapia aquaculture submitted to target ISSI journal for peer-review evaluation

Product: Ten (10) tons of fresh tilapia and one hundred (100) kilos of tilanggit. Market value of approximately Php 1,200,000.00.

People and Services: Fifteen (15) trained fisherfolk cooperators

Places and Partnerships: Partnership with BFAR Region IV-A, NFRDI, and LGUs in Batangas

Social Impact: Increased awareness and technical skills in Tilapia production

Economic Impact: Increased livelihood from the market sale of harvested tilapia

Source: VIP CORALS

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Coral Reef Assessment and Biodiversity Database of Marine Protected Areas of Nasugbu

Rationale:

Located along the heart of Asia-Pacific Region and the entrance of Verde Island Passage, Nasugbu, Batangas has several coves along the shores of Brgy. Papaya. Three of these coves namely: Etayo Cove, Pico de Loro Cove, and Santelmo Cove were declared as Marine Protected Areas by the local government, ensuring the sustainability within the area. In addition to this, Twin Island has also been recently declared as a MPA (MENRO Nasugbu pers. comm).

According to Valdez et. al., in 2015, there are several representatives of from different phylum levels in Nasugbu. This indicates and justifies the presence of high biodiversity in the area as well as the need for monitoring and conservation. The recently concluded "Biodiversity Mapping of MPAs in Brgy. Papaya, Nasugbu" was ale to assess the coral reefs of Santelmo, Etayo, and Pico de Loro coves. However, Twin Island has not yet been assessed. All the data and information obtained in this study will be stored in the online database and website for public access.

Objectives of the Study:

1. To conduct coral reef assessments in the MPAs of Nasugbu using standardized methods.
2. To obtain coral assessment data and geocoordinates in MPAs of Nasugbu.
3. To process the coral assessment data and specific geo-coordinates to obtain biodiversity information for each.
4. To store and manage the biodiversity information and geo-coordinates in an online database and website.

Outputs:

Publications: One (1) publication in ISSI-listed, peer-reviewed journal, One (1) E-book compilation of photos from MPAs of Nasugbu.

Patent: One (1) database and One (1) website.

People Service: Training of Local Government Units (LGUs), representatives from the academe, and citizen scientists in survey methods for coral reef assessment.

Place and Partnership: Establish at least one (1) MOA/MOU with Nasugbu LGU (*e.g.* MENRO Nasugbu).

Policy: One (1) policy recommendation.

Social Impact: Public access to biodiversity information of MPAs of Nasugbu (*e.g.* LGUs, academe)

Source: VIP CORALS

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Development of an Automatic Fish Feeder System for Backyard Tilapia Farming in Nasugbu, Batangas

Rationale:

Aquaculture, which is still growing quickly for food production, plays a big part in the Philippine fisheries sector. 52.2% of the 2.13 million metric tons of fish consumed in the nation between January and June 2021 . Batangas would rank ninth in terms of fish production from aquaculture in 2020 (Philippine Statistics Authority, n.d.). Relative to this, tilapia is the second most common fish kept in a backyard aquarium. Compared to the prior year, its output volume increased by 11%. The number of people having home tilapia ponds in Nasugbu, Batangas, is growing along with the city's population.

The proposed study is an extension of an institutional research project led by Dr. Azcuna of VIP CORALS Nasugbu, which focuses on backyard tilapia farming operations. Numerous concerns have been observed regarding the operation and production of backyard tilapia farming, such as manual feeding, which requires significant time and effort. The proponents intend to design and develop a stationary feeding machine capable of accurately dispensing feeds in predefined quantities and types at least three times daily to address these issues. With this, owners and operators will be able to check on the status of their fish at any time. This will help the beneficiaries to enhance the efficiency and productivity of their backyard tilapia farming operations.

Objectives of the Project:

1. To design and develop an automated fish feeder for backyard tilapia farming;
2. To test the prototype in the hatchery at BatStateU ARASOF Nasugbu;
3. To measure the effectiveness of the proposed system in terms of fish weight; and
4. To determine the market value and the cost of mass production of the product.

Expected Outputs:

Publications: One publication in a refereed journal.

Patent: One patent/ one utility model of the proposed system.

Product: One smart automatic fish feeder for the backyard tilapia farming.

People Service: The system developed in this research will be capable of supporting and assisting the local community in comfortably growing fish on their land. However, the proponents would like to recommend that anyone interested in utilizing the project for backyard fish farming first undergo training. A group of undergraduate BSCpE students will be given the task of developing the physical system.

Place and Partnership: Aside from the target beneficiaries, the researchers can form a partnership with the Bureau of Fisheries and Aquatic Resources (BFAR) to conduct additional testing and refinement of the product, as well as training.

Economic Impact: The project has the potential to increase the volume of food produced in the Philippines, which can then be exported to other countries, thus increasing the country's gross domestic product.

Source: BatStateU, TNEU - ARASOF Nasugbu (College of Engineering/College of Informatics and Computing Sciences)

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BATSTATEU SUPPORTS AQUATIC ECOSYSTEMS THROUGH ACTION

Presentation of VIP CORALS' DOST-funded MBioAssess-VIP and DOST-PCAARRD-funded ULVA and BEAT Projects

The VIP CORALS celebrated its 5th anniversary on February 14, 2023 with the culminating activity to presentat its three (3) Department of Science and Technology (DOST)-funded projects being implemented until 2023. The presentation of the **Marine Biodiversity Assessment in selected areas along the Verde Island Passage (MBioAssess-VIP) Project**, **Understanding Physiological Vulnerability of *Ulva* spp.: Implication to Green Tide Blooms (ULVA) Project**, and **Biological and Ecological studies on *Asparagopsis taxiformis* (BEAT) for Culture Technology Development Project** encompassed their outputs throughout their period of implementation. Attendees of this activity were representative of the DOST-Philippine Council for Agriculture and Aquatic Resource Research Division (DOST-PCAARRD), key officials of the Batangas State University, representatives from partner LGUs, representatives from partner Higher Education Institutions around and out of the Verde Island Passage, representatives from partner hotels, and students of the BS Biology program of BatStateU.

Projects	6Ps					
	Publications	Patents/IP	Products	People Services	Places and Partnerships	Policy
Marine Biodiversity Assessment in selected areas along the Verde Island Passage (MBioAssess-VIP Project)	• One (1) published article in Philippine Journal of Science entitled, "Macrophyte Diversity and Conservation Values of the Verde Island Passage, Philippines" • One (1) published abstract in special issue of Applied Science entitled, "Good coral cover and high biodiversity in Non-MPA Reefs of the Verde Island Passage as a basis for increased protection and conservation." • One (1) storybook, one (1) radio drama, two (2) posters, and two (2) brochures designed and produced with the Social Innovation Research Center (SIRC)	N/A	One (1) VIP database, herbarium, and museum.	Eighteen (18) trained faculty, research assistants, and environmental practitioners.	Memorandum of Agreement (MOA) with four (4) state universities and colleges (Occidental Mindoro State College, Mindoro State University, Marinduque State College, Romblon State College), and four (4) resorts, and one (1) LGU.	N/A
Understanding Physiological Vulnerability of *Ulva* spp.: Implication to Green Tide Blooms	• Five (5) IEC materials about the project and green tide blooms. • One (1) field guide for seaweeds. • One (1) laboratory manual on unialgal culture for *Ulva*. • One (1) poster presentation, presented in the 9th National Symposium and Scientific Meeting of the Philippine Phycological Society, Inc. • One (1) accepted poster presentation in APAMS 2022). • One (1) submitted abstract to the International Seaweed Symposium 2023.	N/A	• Two (2) database and herbarium collections of gathered *Ulva* specimens from the field. • One (1) system/tool for the monitoring of *Ulva* (Ulva Watch)-website platform.	• Hired and trained one (1) Project Staff. • Hired and trained two (2) University Research Associates (URAs) (1 for BatStateU and 1 for UP MSI counterpart). • Six (6) interns and six (6) thesis advisees from the Batangas State University. • Forty-eight (48) participants of the virtual training.	• One (1) signed MOA between Batangas State University, University of the Philippines Diliman, and DOST-PCAARRD. • Six (6) Prior Informed Consents (PIC).	N/A
Biological and Ecological Studies on *Asparagopsis taxiformis* (BEAT) for Culture Technology Development Project	• One (1) poster presentation to the 14th Kuroshio Science International Symposium last November 13 & 14, 2021. • Two (2) poster presentations in the APAMS 2022 of the PAASE on October 11-14, 2022. • One (1) invitation as speaker in oral presentation to APAMS 2022 of PAASE on October 11-14, 2022. • One (1) abstract for oral presentation to the 17th Symposium of the Philippine Association of Marine Science (PAMS) to be presented on July 20-22, 2023.	N/A	• Established 19 herbarium specimens. • Generated two hundred forty-nine (249) data on ecophysiology of *Asparagopsis taxiformis*. • DNA barcode of *A. taxiformis* from Lian, Batangas.	• Hired six (6) trained researchers. • Trained six (6) interns from the Batangas State University.	• Signed MOA between implementing agencies and funding agency. • A signed Material Transfer Agreement (MTA) between Batangas State University and University of the Philippines Diliman. • Five (5) Prior Informed Consents from Nasugbu, Lian, Calatagan, Lemery, and San Luis LGUs.	• Proposed policy brief on management of *A. taxiformis* natural stock in Lian, Batangas and Abra de Ilog, Occidental Mindoro.

Source: VIP CORALS

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BATSTATEU SUPPORTS AQUATIC ECOSYSTEMS THROUGH ACTION

Batangas State University, The National Engineering University as co-host of the 17th National Symposium on Marine Science of the Philippine Association of Marine Science (PAMS)

The 17th edition of the bi-annual National Symposium of the Philippine Association of Marine Science (PAMS) was held in the 5th Floor of the Jose Rizal Building of the Batangas State University-The National Engineering University on July 20-22, 2023. With the theme, “Saving our seas: Restoring our marine systems for people and nature”, it was attended by approximately 500 participants from different organizations and institutions from 5 different countries as remarked by Dr. Jayvee A. Saco, PAMS president, in his opening message. Oral and poster presentations were showcased by participants in six (6) different categories, covering the biology of marine organisms, assessment of marine organisms, policies that may be implemented to protect the marine environment, innovations on fisheries, marine habitat degradation and management, people’s knowledge on the marine environment, and modern approaches in studying the marine environment.

Source: VIP CORALS

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BATSTATEU SUPPORTS AQUATIC ECOSYSTEMS THROUGH ACTION

Acceptance of Interns in BatStateU's Marine Research Center

The Verde Island Passage Center for Oceanographic Research and Aquatic Life Sciences (VIP CORALS), Batangas State University's marine research center welcomed another batch of interns to its doors. For two hundred (200) hours, fifteen (15) students of the BS Biology program from the College of Arts and Sciences (CAS) of BatStateU learned about administrative, laboratory, and field works that is being done in the VIP CORALS. The interns' On-The-Job Training took place from June to July, 2023. Those interns were vital on the success of the 17th National Symposium in Marine Science of the Philippine Association of Marine Science that took place on July 20-22, 2023 in BatStateU.

Source: VIP CORALS

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