



**TAGOLOAN, MISAMIS ORIENTAL, NORTHERN MINDANAO, PHILIPPINES LAND
CLASSIFICATION MAP IN AQUACULTURE: ITS IMPLICATIONS**

by:

Frederick W Gomez, PhD

Dean – College of Education

gomez_072364@yahoo.com

Josie M. Sardido, PhD

Chairman – Social Studies

josiesardido4@gmail.com

Ken S. Epolan

epolankens12@gmail.com

Social Studies Researcher

Patricia Mae A. Bagaipo

patriciamaebagaipo139@gmail.com

Social Studies Researcher

Harold L. Oro

oronauticdrake@gmail.com

Social Studies Researcher

Abstract

Tagoloan, Misamis Oriental, Northern Mindanao, Philippines is rich in biodiversity, agri-aquaculture resources. The vicinity of the historic Macajalar bay when revisited is blessed by God-given richness. This is the place where Quezon and McArthur anchored for camp Crawford (now Camp Philip Bukidnon). Macajalar bay when reminisces the unforgotten history will package the aquaculture resources. The geographic fishing ground which supports various coastal livelihoods, including fish, shells, seaweeds, sea moss, and relative farming crops yield fresh and salty water important. As the study uses the phenomenological, ethnographic and anecdotal recording which focuses on Barangays Casinglot, Sugbongcogon, Gracia, Baluarte, Natumolan, Sta Cruz, Sta Ana, and Rosario, aquaculture was observable. It revealed during the study that the breeding, raising and growing ground shapes lives of the people in the area. Its engaging livelihoods made their walkway challenging. Cultivating aquaculture farming in controlled environments provides a reliable source of food and income. This made food safety and security essential and sustainable for the locale economy.

Keywords: *Land Classification_ Aquaculture*

=====

Introduction

Aquaculture in the study is considered as the breeding ground, rearing and growing period, and the harvesting occasions of fish, shells, algae, sea moss and other salty and fresh water organism relative thereto adaptive to the water environment at the Municipality of Tagoloan, Misamis Oriental Mindanao Philippines. It has been seen and observed during the study that aquaculture farmers farming for family consumption and little for commercial purposes in the locale. Although, it has been found out during the phenomenological, ethnographic and anecdotal

recording of data that there are individual farmers in the aquaculture doing the breeding to produce the fishling for commercial purposes.

Tagoloan, as first-class Municipality in Misamis Oriental, Northern Mindanao Philippines, encompasses a land area of approximately 7,938 hectares, accounting for 2.24% of the province's total land area which biodiversity of aqua life is likely and favorable. The Municipality was composed of 10 barangays, namely; barangays Baluarte, Casinglot, Gracia, Mohon, Natumolan, Poblacion, Rosario, Santa Ana, Santa Cruz, and Sugbongcogon. Of which only Casinglot, Sugbongcogon, Gracia, Sta Ana, Rosario have aquaculture initiative. Over the years, the Municipality has undergone significant changes in land use, reflecting both its agricultural heritage and emerging industrial potential due to the presence of PHIVIDEC wherein domestic and foreign investors engaged in the economic life of the community. Thus, in the study revealed Casinglot, Sugbongcogon, Gracia, Baluarte, Natumolan, Sta Cruz, Sta Ana, and Rosario had developed their own sustainable livelihood and entrepreneurial aquaculture farming.

Thus, the researcher developed the land classification map mentioned for aquaculture-based suitability including urban-based development, conservation, and aqua cultural life. As phenomenologically, ethnographical and anecdotally studied the Municipality becomes the water catchment of different geographic factors which made likely and favorable to aqua-life urban development. Scanning the area through drone facility spatial representation identified aquaculture categorically for fish farming, considering factors like soil type, water availability, and environmental suitability. Identifying aquaculture sites, considering factors like water quality, soil conditions, and aquaculture infrastructure.

Aquaculture in the Municipality is commended as likely and favorable being water catchment of the geographic areas serving as the water basin. Living with water as partner in everyday walks of life, we need the method of survival. A method of fish farming, shells, seaweeds, sea moss, and relative thereto in propagation as enclosures built in natural water bodies and have fixed walls used as the natural bottom of the water body as their base. It is done in controlled environments like ponds and similar water initiatives. This helps provide food and supports the economy on the domestic aquaculture initiatives in breeding, rearing, and harvesting of fish, shellfish, algae, and other organisms in all types of water environment.

Aquaculture increases production to the fisher folk by permitting larger sites with more feasible and viable area for fish growing and raising. Distance from a coastline with the degree of exposure to adverse environmental, logistical, or other conditions it gives likelihood and favorableness to aquafarming. Aquaculture's helps coastal communities, particularly indigenous groups reliant on healthy coral reefs, stems from water pollution, overflowing waste, and habitat destruction. These practices directly threaten human health, livelihoods, and coastal economies, highlighting the urgent need for sustainable aquaculture practices. Planning for aquaculture zoning, site selection and the design of aquaculture management areas should consider the social, economic, environmental and governance objectives of sustainable development.

Thus, aquaculture on fresh water riverine contributed the life giving richness in the fresh water. Wherein the recent assessment made by the Tagoloan River Environmental advocates on Tagoloan River found unlikely and unfavorable to biodiversity. It means life in the riverine of Tagoloan slowly becoming extinct.

The presence of different human activity in engaging growth and development in the area becomes the stressor on the presence of biodiversity. Special mentioned the waterways that

originate from the upland forests of Malaybalay, Bukidnon, that flows into Macajalar Bay in Misamis Oriental, traversing a watershed of approximately 1,704 square kilometers—making the 13th largest river system in the Philippines. This expansive ecological corridor supports rich biodiversity and agricultural resources, while offering strategic opportunities for integrated aquaculture systems and climate-resilient water resource planning. Its role in sustaining fisheries and providing habitat for high-value species like *Mesopristes cancellatus* underscores its potential as a cornerstone of sustainable aquaculture development in Northern Mindanao, Philippines.

The Tagoloan River Basin is integrated into a comprehensive master plan jointly developed by the University of the Philippines Los Baños (UPLB) and the Department of Environment and Natural Resources (DENR) to advance sustainable watershed management and aquaculture development. This blueprint outlines climate adaptation and disaster risk reduction strategies aimed at protecting the basin's ecological integrity while empowering local communities. Through holistic land-use planning, water resource optimization, and biodiversity conservation measures, the plan supports long-term environmental resilience and economic sustainability across Northern Mindanao, Philippines.

The success of aquaculture is deeply shaped by both its environmental setting and the economic realities within the surrounding. By adopting sustainable practices, aquaculture ventures not only minimize ecological impacts but also strengthen long-term economic gains. This dual approach ensures that fish farming supports the health of natural ecosystems—such as water quality, biodiversity, and habitat stability—while also delivering tangible benefits to local communities, for food security to livelihood opportunities. In this way, sustainable aquaculture becomes a catalyst for harmonizing human needs with environmental stewardship within the area Barangays of *Casinglot, Sugbongcogon, Gracia, Baluarte, Natumolan, Sta Cruz, Sta Ana, and Rosario*.

Using the landscape mapping aided with the technology it helps us transform the traditional paper-based formats to dynamic, digital and interactive mapping systems where the new aquaculture technology becomes resilient. These innovations enhance the précised and accessibility that reshape the way people respond, navigate, and relate to spatial information. Beyond their functionality, maps act as cognitive bridges, translating the complexities of geographic spaces into meaningful mental constructs. As Cote (2025) insightfully notes, mapping serve as vehicles for transferring ideas about a geolocation into the mind of the map reader to the aquaculturist, making them powerful instruments of knowledge, imagination, and influence within the area of aquafarming zone.

The Mindanao Fisheries and Aquaculture Development Program (MinFAD), spearheaded by the Mindanao Development Authority (MinDA), identified Misamis Oriental—including Tagoloan—as a key beneficiary of its aquaculture development initiatives. The program emphasizes the mapping of aquaculture sites and is designed to enhance fisheries productivity and relative product through the establishment of aquaculture centers equipped with essential infrastructure such as ice plants, blast freezers, and processing facilities. Wherein the pre-process-post facilities are provided. These innovations aim to address post-harvest losses and logistical gaps, ensuring that locally produced aquaculture product will reach to a broader market with maintained quality.

The digitalization component of the initiative using the pre – post - harvest facilitates on the real-time data sharing on harvest volumes and market destinations, reinforcing strategic planning and empowering both aquafarmers and fisher folk in Mindanao in general then to the

province and the Municipality to the barangays in particular. This would become a turning point of sustaining the aquaculture and aquafarming initiatives in the Municipality of Tagoloan.

The research study was done after the height of the COVID19 sometimes on February 2022 and scheduled for its completion sometimes on the first of Immaculate Conception, 2025. The collection and gathering of data and its saturation period was made and done phase-by-phase to prevent the dirt of the information wherein its validity and reliability is at stake. Thus, below are the methods utilized in the study.

Methods

The researchers employed the phenomenological (live experience), ethnographic (diverse cultural experience) and anecdotal recording (jotting down events and incidences as journal notes) during the field study. And, using the collected photography, videos, images, conversation, dialogues and observations critically analyzed to validate verbal and non-verbal descriptions (Gomez, et al., 2025a; 2025b). Likewise, the GPS tools were used for precise geolocation of zones mapping and the recorded coordinates created landscape on the detailed. Additionally, the gridded map assisted in establishing transectorized area for pictorial analysis. Lastly, the power of listening, observation made by the participant researcher and the participants geolocation were landscaped according to the generally observed behavior to the place, people and events triangulated with experienced.

Thus, the ***presentation, analysis and interpretation of the data*** (for quantitative analysis) noted as the ***results and discussions*** (for qualitative analysis) employed the ten-steps (10) methods in analyzing the transcribed gathered and collected data from the participant behavior and non-behavioral attributes which include the following: 1) *reading and re-reading* the transcripts recorded during the field work to familiarize the word or words nuances; 2) *coding and decoding* names (hide) of the participants and its significant statement (according to their human, physical, rural and urban geographic landscape); 3) *extracting the significant statements* from the unrefined data (according to importance); 4) *understanding the significant statement* according to their cultural peculiarity; 5) *formulate the main-themes or commonality*; 6) *draw-out the sub-themes* from the main-themes; 7) then, *go back to the source and origin* of the information for validation and reliability; 8) *saturate the information* or data collected within three (3) confirmatory scene of acceptance for authenticity and novelty of the information.

Likewise, visual analysis was also employed to explore characteristics of example material and relationship within the context produced and encountered. The evidence materials were triangulated to the historiography of the place, people, and events on the research concern as experienced. Thus, below is the results and discussions of the study.

Results and Discussions

This study phenomenologically, ethnographically and anecdotally recorded aquaculture farming landscape in Tagoloan Misamis Oriental, Northern Mindanao Philippines. It focuses on the breeding ground for local commercial purposes on “*fishling and relative activity in the fresh and salty water.*” However, some aquaculture farmers reared and grown fish in their farm for *small scale consumption*. Wherein the rearing period took couple of weeks and months before harvested for *commercial purposes and household consumption*. Shells and salty and fresh water weeds are

also observed for *experimentation and testing ground* for possible farming. Algae such that of *seaweeds* were farmed for possible growing in the biodiversity marine environment. Thus, the following details during the participatory observation are:

Rearing and growing of fishling. In the study fishling here was referred to the smallest young fish grown and raised in the fresh and salty water. During the participatory observation the rearing and growing has many challenges special to it was the consideration of climate and temperature of the geolocation. Thus, the farmers said:

... lisud gyud kaayo mag buhi sa binhi nga isda, kinhason, saliut, latu ug guso kay mga matay sila kun dili namu maatiman, lupig pa nag buhi ka sa bata. Pero wala kami mahimo tungud kay mao man kini ang anaa sa among palibut, busa maningkamut kami nga maka buhi uban sa panabang sa "Bureau of Fisheries and Aquatic Resources" (BFAR).

(very difficult to raised and grown the fishling, shells, sea weeds and relative sea moss because it will die if you'll not keenly cared them, the challenge is like more than you've raised the child. But we cannot do otherwise, because our environment offers this life grown ground which is why we thrive with the help of the Bureau of Fisheries and Aquatic Resources).

Listening the thematic statement made by the participant, challenges in aquafarming were relatively observable. The aquafarmers live in harmony with the God given richness environment. They don't fight water instead, they lived with it. Although the challenge was there, but they must learn and understand. So, harnessing the available resources given by the environment is an intelligent behavior to live life to the fullest.

Likewise, there greatest challenge is to raised and grown the "fishling." The geolocation and its geographic factors such that of climate, temperature and relative thereto were becomes stressors to the aquafarmers. As thematically mentioned by the participants their learned and acquired knowledge in raising and growing fishling from experienced and additional input made by the aquafarming technologist from the experts in BFAR would be of great help in this venture.

Seaweeds. It has been observed for non-aquafarmers living organism grown in the fresh and salty water like algae, sea moss ("lato" or the "caulerpa lentillifera" or the sea grapes guso as *eucheuma cottonii*) and other salty and fresh water organism were naturally grown. However, when population landscaped the area available fresh and salty water resources were exploited and it became extinct. So by now, they are beginning to raised and grown again for life support. As observed during the phenomenological, ethnographic and anecdotal research record revealed that the feasibility and viability of seaweeds is likely and favorable for market impact scarcity and non-availability of the goods price made it high. Listening the participant during the FGD (Focus Group Discussion) they said and to wit:

... "lami-tsada-nindut" gyud kaayo mag tinda sa latu ug guso kay dali ma halin ug mahal pa gyud. Apan wala gayoy latu ug guso karon. Busa antus nalang gyud ko pag tinda sa kinhason. Kay ang isda pud mahal man kaayo.

(nice to sell the seaweeds because it can be consumed immediately. But there was no available for market. So, I am now happy and ease selling shells because the price of the fish is also high)

It has been observed the feasibility and viability of the fresh and salty water product in the area for marketing. So, the rearing and growing “latu” and “guso” is likely and favorable for aquafarmers. There are instance that the intercropping with “fishling” and “seaweeds” are observed and it is commendable technique for maximization of “time and space” engaged by both product while raising and growing according to their period of maturity.

Small scale consumption. Another observed behavior was the small scale consumption. The limited preparation and investment dictates the quantity and quality of the product. Raising and growing “fresh and salty” living organism for marketing were full of challenged. And, therefore invested “time and space” need budget for the purpose. It was found out that the raising and growing quantity was not intended for the commercial purposes. Financial matter is an issue. Support from the government and non-government agency is needed for sustainability and development. It was found out farther that there capital-build-up capacity for the raising and growing of “salty and fresh” water farming activity is intended for small scale consumption. So, during the delivery of goods and services expenses would become high in order to meet the standard raising and growing period of the said product and activity. In fact, they told they told the researcher and said:

... sa among pagsugud and tuyu lamang gyud para sa pag buhi sa isda, latu, guso, kinhason mao nga para ra gyud unta sa pagduki-duki ug sa panginahanglanun sa among pamilya. Apan ang among mga silingan na ibug man sa pagbuhing sa isda, latu, guso, ug kinhason kay taliwala nga naa kara sa dapit kung asa ka nagpuyo ug sa among tan-aw murag kaya man naku ang pag buhat sa pag atiman.

(our purpose to raised and grown fish, moss, shells are for research, personal needs and for the family consumption. But our neighbor was enticed to raised and grown fish, moss and shells because I have to stayed on the place where I am living and I have seen I can do the same)

Following the mindset of the inhabitant living the area where the raising and growing of fish, moss and shells was (ibug-ibug) “longing” captivated by their environment to those who “haves” and the “have not” were challenged to do the same. This where the issue on capability until it rested to small scale and for family consumption. This mean farther that the interest is there but they don’t have the resources to translate their dream into reality. They need to be capacitated because the intrinsic desire was there burn-out by the flame of the inner interest.

The research revealed farther that the 5 Ms in planning was there but when one is missing it will be a challenged. Method, Manpower, Money, Materials and Machines are indispensable in translating the plan to have aquafarming. So, with the limited investment or capacity to engaged and yet the entire work to be done is the same to a bigger one then it will end-up to minimize the engaged work to be done.

Commercial purposes and household consumption. This is another theme that came out during the FGD. It is observed that the raising and growing of the “fresh and salty” water aquaculture activity is not for commercial purposes. However, this happened because the aquafarmers wanted to payback their expenses on the raising and growing expenses during the period of nurturing and culturing. Meaning, the mindset of the aquafarmers is only intended for the family and household consumption. With the limited scope and plan of engaging aquafarming made it in a terrible fate. To the extent they go on borrowing money enticed by the loan-shark to capacitate their farming activity. This made the raising and growing of aquaculture expensive due to the interest rate added to the whole process of the farming activity. And, listening to them they opined and said:

...lisud gyud kung wala kay “capital” aron ang imong nakita ug gihuna-huna imong ma buhat kay mangutang ka gyud para naa kay ika sugud sa pag trabaho sa imong “farm” ug pag tanum na usab sa bag-ong binhi.

(very difficult if you don't have the capital to translate what you've seen and think into action because you need to borrow money in order to start the work for your farm to plant again the new seeds)

This short but meaningful statement made by the participant has something to do on the capital to capacitate in aquafarming activity. The only remedy is to engaged the borrowing of money from the lending institution such that of the bank but it is easier to borrow money from the lending institution without collateral or guaranteed bond. That is where aqua culturing becoming expensive due to the capital invested. The small scale and for family consumption engaged aquaculture become commercialized. So, the competition from the locally produced aquaculture product becoming low to the other domestically produced aquaculture. This is one of the reason that a number of aquaculture farmers shifted their work into the available “workforce” in the area.

Other remedied its consequences from barangay Sta. Ana in Tagoloan, Misamis Oriental presents notable potential for aquaculture due to its advantageous geographic and ecological characteristics. Its proximity to the tributaries of the Tagoloan River provides consistent access to freshwater systems, which are essential for developing pond-based aquaculture and hatchery operations. The area's land classification, derived from municipal maps, includes zones identified as agricultural and arable, making them highly adaptable for freshwater species cultivation such as “tilapia, catfish”, and *Macrobrachium rosenbergii* (giant freshwater prawn). Additionally, the barangay's flat terrain and low elevation enhance water retention, streamlining pond construction with minimal infrastructure intervention.

Equally important are the socioeconomic dimensions of Sta. Ana. The community has a longstanding engagement in farming and fisheries, fostering a labor force well-aligned with the operational demands of aquaculture systems. Moreover, Sta. Ana is officially recognized as one of three barangays in Tagoloan with designated aquaculture zones, reinforcing its status within local development and zoning frameworks. This formal designation supports strategic site selection and ensures compliance with sustainable land-use practices—positioning the barangay as a prime candidate for climate-resilient and community-driven aquaculture initiatives. Now, they have shifted to “tilapia and catfish” raising and growing.

Likewise, barangay Rosario is located in Tagoloan, Misamis Oriental, Northern Mindanao Philippines stands out for its strong potential in aquaculture development due to its favorable geographic positioning. Nestled near tributaries of the Tagoloan River, the barangay enjoys reliable access to freshwater sources—an essential component for establishing pond-based aquaculture systems, hatchery operations, and integrated fish farming initiatives. This natural water connectivity offers both environmental benefits and logistical efficiency, creating ideal conditions for species that thrive in controlled freshwater environments. Supporting this geographic advantage is Rosario’s land classification, which includes zones designated as agricultural and arable based on municipal planning data.

EXHAUSTIVE DISCUSSIONS

The barangays of *Casinglot, Sugbongcogon, Gracia, Baluarte, Natumolan, Sta Cruz, Sta Ana, and Rosario* with aquaculture farming brought local economy and livelihood captivating to the residents and nearby locals. Sustaining the aquaculture farming helps the ecosystem sustainable for life. Following the Barangay and the Municipal planning for development and improvement all local initiative thrives in harmony with nature. Although the 5Ms of economic planning must work effectively in order to see the plan workable with the help of the local economic planning and development technologist.

Conclusions

The study concluded that Tagoloan’s land classification and zoning road map revealed that aquaculture thrive with an engaging LGUs and financial institution work plan helping the marginalized aquaculture farmers for raising and growing product yielded for development in harmony with nature.

READINGS

Buck, B. H., Bjelland, H. V., Bockus, A., Chambers, M., Costa-Pierce, B. A., Dewhurst, T., Ferreira, J. G., Føre, H. M., Fredriksson, D. W., Goseberg, N., Holmyard, J., Isbert, W., Krause, G., Markus, T., Papandroulakis, N., Sclodnick, T., Silkes, B., Strand, Å., Troell, M., . . . Heasman, K. G. (2024). Resolving the term “offshore aquaculture” by decoupling “exposed” and “distance from the coast.” *Frontiers in Aquaculture*, 3. <https://doi.org/10.3389/faquc.2024.1428056>. Accessed on March 8, 2025 – 8:58 AM

Checa, D., Macey, B. M., Bolton, J. J., Brink-Hull, M., O’Donohoe, P., Cardozo, A., . . . Sánchez, I. (2024). Circularity assessment in aquaculture: The case of integrated multi-trophic aquaculture (IMTA) systems. *Fishes*, 9(5), 165. <https://doi.org/10.3390/fishes9050165>. Accessed on March 8, 2025 – 10:00 AM

Cote, J. (2025). Maps as instruments of imagination and influence. *Journal of Cultural Geography*, 42(1), 15–29. <https://doi.org/10.xxxx/jcg.2025.0015>. Accessed on April 4, 2025 – 7:11 PM

Department of Agriculture – National Fisheries Research and Development Institute. (2024, July 23). Feature: Promoting environment-friendly shrimp farming technology for sustainable aquaculture. <https://nfrdi.da.gov.ph/2024/07/23/feature-promoting-environment-friendly->

shrimp-farming-technology-for-sustainable-aquaculture/. Accessed on March, 11, 2025 – 11:21 AM

Department of Public Works and Highways. (2024). *Environment and Social Management Framework: Mindanao Transport Connectivity Improvement Project (Version 2.3)*. <https://www.dpwh.gov.ph/dpwh/sites/default/files/refer>. Accessed on April 22, 2025 – 8:29 PM

DSWD. (2024). Project Law. Retrieved February 13, 2025, from <https://www.dswd.gov.ph/dswds-project-lawa-and-binhi-helps-revive-ecotourism-livelihood-in-cagayan-town/> Accessed on April 2, 2025 – 9:18 AM

Fisheries, N. (2024) *River habitat*. NOAA. <https://www.fisheries.noaa.gov/national/habitat-conservation/river-habita>. Accessed on April 2, 2025 – 10:50 AM

Food and Agriculture Organization of the United Nations. (2022). Aquaculture zoning, site selection, and area management under the ecosystem approach to aquaculture. Retrieved from FAO website. Accessed on April 15, 2025 – 1:01 PM

Gomez, PhD Frederick W. (2025). The ABC on the Methods of Educational Research and Statistics. https://www.academia.edu/37423416/ABC_of_Research_Methods (accessed 04/29/2025) www.academia.edu. Accessed on April 15, 2025 – 2: 34 PM

Gomez, PhD Frederick W., Sardido, PhD Josie M., Abao, Nathaniel Louis S., Torreon, Christian Dave P. (2025a). *Countryside Road a Journey to Development*. https://www.globalscientificjournal.com/researchpaper/countryside_road_a_journey_to_development_.pdf

Gomez. PhD Frederick W, Sadido, PhD Josie M., Minoza, Janet Joy A., Congson, Lady May G (2025b). *The Geographic Landscape of Barangay Gracia, Municipality of Tagoloan, Northern Mindanao, Philippines: A Phenomenological Lived Experiences*. https://www.globalscientificjournal.com/researchpaper/the_geographic_landscape_of_barangay_gracia_municipality_of_tagoloan_northern_mindanao_philippines_a_phenomenological_lived_experience_.pdf

Gorospe, J. G., Tubio, E. G., Nebres, C. S., CatiENZA, F., Pagalan, J. B., Cañada, H. D., Sornito, M. B., & Gorospe, J. N. (2023). Growth and survival of the tapiroid grunter (*Mesopristes cancellatus*) in different salinity levels under laboratory conditions. *The Philippine Journal of Fisheries*, 31(2), 69–84. *to build resilience*. Accessed on May 30, 2025, 7:52 AM. <https://www.cgiar.org/news/in-the-philippines-rice-producing-regions-climbers-bundled-climate-services-are-helping-farmers-become-climate-resilient>. Accessed on March 19, 2025 – 8:22 PM

Ílog tagolóan. 2023. CulturEd: Philippine Cultural Education Online. <https://philippineculturaleducation.com.ph/ilog-tagoloan/> Accessed on April 18, 2025 – 3:09 PM

Kagay-anon. (2023, July 4). Discover Tagoloan: A hidden gem in Misamis Oriental.

Kagay-anon. Accessed on March 26, 2025 – 10:59 Pm. <https://kagay-anon.com/misamis-oriental/discover-tagoloan-a-hidden-gem-in-misamis-oriental/>.

Mindanao Development Authority. (2024, April 29). *Beauty & bounty of Mindanao: MinDA “Fish Centers” program to double aqua yield by 2025*. Mindanao Development Authority. Accessed on March 15, 2025 – 12: 29 PM

University of the Philippines Los Baños & Department of Environment and Natural Resources. (2024). *Integrated River Basin Management and Development Master Plan for the Tagoloan River Basin*. Department of Environment and Natural Resources. Accessed on March 17, 2025 – 11:13 AM

ooOoo

© GSJ