Mindoro Journal of Social Sciences and Development Studies (MJSSDS)
Vol. 2, No. 2, Jul-Dec 2025, pp. 30-36
eISSN: 3028-1628; pISSN: 3028-161X, https://journal.omsc.edu.ph/index.php/mjssds/article/view/112

Seas of opportunity: Development of an innovative capacity building program for thriving seaweed producers

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Article Info

Article history:

Received: October 28, 2025
Revised: November 14, 2025
Accepted: November 27, 2025

Keywords:

capacity building program
innovative capacity
needs assessment
seaweed farming

ABSTRACT

Seaweed aquaculture supports several coastal communities in the Philippines, but aquaculture farmers experience declining production, stagnant markets, and lack of access to innovation. In Occidental Mindoro, these restrictions pose risks to livelihood sustainability while at the same time providing prospects for product development and capacity building. This study evaluated the knowledge, skills and training needs among 30 purposively sampled seaweed farmers in Magsaysay through a descriptive research design and structured questionnaire. Data was analyzed by using descriptive statistics. Findings indicated that most farmers were of prime working age (30 - 39), were predominantly male, married, and high school educated. Community-based knowledge exchange was confirmed through their primary information sources, which included meetings and seminars (56.7%). Farmers showed a strong interest in entrepreneurship, more specifically the topic "Your Seaweed, Your Business: Learning the Entrepreneur's Mindset." Face-to-face training was the preferred modality (M=4.8) and 16 hours was considered the optimal duration. Although individual Local Authorities provide support, there are currently no formal programs. The study concludes that seaweed entrepreneurs can and are willing to respond to participatory, community-based training programs which can combine entrepreneurship, sustainability practices, and innovation. Such efforts will assist seaweed aquaculture to shift from a subsistence-oriented activity to a resilient and market-oriented activity.

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1. INTRODUCTION

Seaweed farming has long been recognized by many communities on the coast as a livelihood - a tradition handed down through generations. Nevertheless, despite its enormous potential, most seaweed farmers still suffer from the same problems: low market prices, access to modern technology, knowledge of value-added processes, and environmental threats that threaten their harvests. Similarly, it was found out that there is a decreasing level of production due to environmental problems, and a stagnant market condition as a threat for growth and sustainability, but with potential product development and (Durrani et al., 2024).

Sometimes, it's not a lack of effort, but a lack of access to the proper tools, modern techniques, value-adding opportunities and knowledge of markets and business. Farmers know how to grow their seaweed, but they might not have had a chance to learn how to turn their produce into higher value products, how to sell it well, or in essence, how to use a simple piece of technology that can save time, cut waste and increase profit (Sultana et al., 2022).

This has led to an initiative to undertake a formative evaluation which is ostensibly to make an attempt to know what they already know and want to know and what kind of support the seaweed growers require to be able to constantly adapt to a changing environment. This suggests that sustainable environmental practices can be embedded into business operations to help adapt to shifting market conditions, to reduce potential disruptions, and to ensure long-term viability or otherwise develop long-term resiliency (Wolniak et al., 2023).

Finally, the results of this assessment will guide the development of a capacity building program, a bottom-up process to develop the capacity of seaweed farmers as producers, but also as innovators, entrepreneurs, and stewards of the sea. And in doing so, several factors must be taken into account, such as support from the government in the form of training for the adoption of advanced manufacturing technology, increasing food quality standards, conducting research, and food innovation (Busthanul et al., 2023). It isn't just a program - it is a movement by the community, for the community. Seaweed farmers are more than just workers of the sea, they are dreamers, innovators and protectors of their coastal heritage.

By identifying real needs and tailoring training to meet them, this research hopes to create learning opportunities that are practical, empowering, and life-changing because every seaweed farmer deserves the chance to grow, not just their crops, but their future (Hurtado et al., 2017). This project breathes life into the belief that progress is not only about increasing harvest but also about strengthening dignity, building confidence, and fostering unity among communities. This aims to make the seaweed farms stand tall – not only for their families – but also as leaders who contribute to the sustainable growth of their community.

Although several studies have been done on seaweed farming in the Philippines, there remains a clear research gap when it comes to understanding the needs of seaweed farmers in enhancing their capacity in Occidental Mindoro. While other research has mainly concentrated on farming practices, environmental concerns, and economic impacts of this sector in the country, there is still a limited understanding of their needs for capacity building programs conducted for them particularly within the local context of the province. With this, the study aims to identify the current understanding of essential skills for sustainable farming practices, innovation, product development, financial management, and entrepreneurship among Seaweed Farmers; determine the existing information needs regarding the importance of innovation, technology, financial management, and entrepreneurship; and assess the training modalities and time duration preferred by the training participants.

2. METHODOLOGY

2.1. Design

This study employed descriptive research which aimed to determine the status and needs of the seaweed farmers that are necessary in the development of innovative capacity building program. Specifically, the study focused on identifying the socio demographic profile, Source of Information accessed by Seaweed Farmers; topic to farmers as to the challenges and opportunities in seaweed production; Training Modalities; preferred length of training; and list of partners and programs.

2.2. Sample

The target population of this research is the seaweed farmers located in Magsaysay, Occidental Mindoro. For sampling techniques, a purposive sampling was used to ensure the representation of the population in this sector. The following were set as the criteria for selection:

1. farmers who have been engaged in seaweed farming for 3 or more years.
2. those who are actively engaged in seaweed farming.
3. farmers who are willing to participate during the data collection process.

2.3. Data Source

The data were collected from the respondents using a survey instrument for socio-demographic characteristics, source of information, and topic to farmers as to the challenges and opportunities in seaweed production. While, a 4-point Likert scale survey instrument was used for gathering the data about training modalities, preferred length of training, and list of partners and programs.

2.4. Data Collection Procedure and Analysis

The following sequence of activities was done in order to come up with the results and findings of the study.

Conceptualization, Review Literatures and Theoretical Basis. Defined objectives of the study, select and review related literatures and studies that would support the research objectives.

Respondents and participants identification. Determined the people who will be responsible in answering the questionnaires and those who will play significant part in data collection procedure.

Instrument preparation. Instruments were prepared and constructed based on available related literatures and studies. And, validated by the experts in the field.

Data collection, management, and analysis. In the process of data collection, the approval of respondents was assured before the data gathering commenced. Specifically, the researchers collected data from respondents in Occidental Mindoro. Also, collected data were encoded systematically using Microsoft excel and treated using SPSS version 21. After the data were encoded, it was analyzed using different statistical tools such as mean, frequency distribution, and percentages.

2.5. Ethical Considerations

This research strictly adheres to Data Privacy Act of 2012, where all the information provided by the respondents of the study will be kept confidential. Permission from the respondents and other authorities were obtained before proceeding to gather necessary data and assured the anonymity of all details about their identity.

3. RESULTS

3.1. Socio-demographic characteristics of Seaweed Farmers

Majority or 36.7% of seaweed farmers are within the age range of 30-39 years old, which means that this sector is largely driven by individuals in their prime working years, bringing with them both energy and experience. Their active participation indicates a promising future for seaweed farming, as this age group is often open to innovation and committed to sustaining their livelihoods through hard work and adaptability. While the production of seaweed is still dominated by male farmers, both of which reflects the nature of the work (because more male muscles are required) and the opportunity to encourage more inclusive involvement (especially by women) in the future of seaweed farming or other livelihood activities. Moreover, majority or 53.3% of farmers are already married, which has contributed further to their dedication to seaweed farming as primary source of income in the family. Lastly, 50% or 15 of the seaweed farmers have earned high school diplomas, which implies that a considerable portion of the farming community has attained a basic level of formal education, which can contribute positively to their ability to adopt new techniques, understand market trends, and engage in sustainable farming practices. It also highlights the potential for further training and capacity-building programs that can build on their existing knowledge to improve productivity and livelihoods [Table 1].

Table 1. Socio-demographic characteristics (n=30).

SOCIO-DEMOGRAPHIC CHARACTERISTICS	FREQUENCY	PERCENTAGE (%)
Age		
20-29	5	16.7
30--39	11	36.7
50-59	7	23.3
60-69	7	23.3
Sex		
Male	18	60.0
Female	12	40.0
Civil status		
Single	10	33.3
Married	16	53.3
Separated	4	13.3
Educational attainment		
Elementary	11	36.7
High School	15	50.0
College	4	13.3

3.2. Source of Information accessed by Seaweed Farmers

The seaweeds farmers provided that their source of information are meetings or seminars (n=17; %=56.7); LGU Training Providers (n=9, %=30); social media (n=3, %=10); and print media (n=1, %=3.3), respectively. This implies that the farmers gather data or information from each other in their community as compared to their online access [Table 2].

Table 2. Sources of information (n=30).

SOURCES OF INFORMATION	FREQUENCY	PERCENT (%)
print media	1	3.3
social media	3	10.0
Meetings/seminar	17	56.7
LGU training providers	9	30.0

3.3. Topic to Farmers as to the Challenges and Opportunities in Seaweed Production

Majority or 26.7% found the topic "Your Seaweed, Your Business: Learning the Entrepreneur's Mindset" the most relevant topic. While all topics were found to be relevant as well to their sector. This implies the open interest of the farmers in seaweed innovation and entrepreneurship which could help them with additional sources of income and livelihood [Table 3].

Table 3. Relevance of the topic (n=30).

INFORMATION NEEDED	FREQUENCY	PERCENT (%)
Sustainable seaweed production	4	13.3
Importance of technology in enhancing seaweed productivity	1	3.3
Innovative business approaches that change lives	1	3.3
From shore to store: understanding the true value of seaweed	3	10.0
Marketing seaweed value-added products: strategies for the 4Ps	3	10.0
Your seaweed, your business: learning the entrepreneur's mindset	8	26.7
All topics	4	6.7
Topic 2 and 5	3	3.3
Topic 5 and 6	3	10.0

3.4. Training Modalities

Further, farmers always prefer face to face training (mean=4.8). This is because of their access to internet and other modalities since they are in a coastal rural area where internet connectivity still their primary concern. And with their increasing challenges and opportunities in their sector, the farmers found all the 7 topics relevant to enhance their knowledge and skills and improve their economic condition [Table 4].

Table 4. Preferred training modalities.

TRAINING MODALITIES	MEAN
Online (Zoom, Google, Teams etc.)	3.60
Online (Facebook live)	2.50
Face to face	4.80
Modular (printed modules)	1.30
Small group meetings	3.40
ICT-based Tools (SMS, Apps)	2.00
Print media (leaflets/posters/brochures/comic)	1.50
Educational video program	3.00

Interpretation: 0.50–1.50 = Never; 1.51–2.50 = Rarely; 2.51–3.50 = Sometimes; 3.51–4.50 = Often; 4.51–5.50 = Always

3.5. Preferred Length of Trainings

Based on the initial assessment conducted, the seaweed farmers always prefer 16 hours as training duration. While, eight (8) hours was often chosen, followed by four (4) hours, and lastly, 24 hours, respectively [Table 5].

Table 5. Preferred training duration.

TRAINING DURATION	MEAN
4 hours	2.40
8 hours	4.40
16 hours	4.70
24 hours	1.70

Interpretation: 0.50–1.50 = Never; 1.51–2.50 = Rarely; 2.51–3.50 = Sometimes; 3.51–4.50 = Often; 4.51–5.50 = Always

3.6. Partners and Programs in the community

The Provincial Government Office and Local Government Unit of Magsaysay are helping hand in hand to improve the farmer's quality of life and their seaweed production annually. However, the agencies have openly stated their interest and support in this project for seaweed farmers since they have no existing project for them, but they provide resources to their community regularly.

4. DISCUSSION

The results of the study show that an important demographic group, in full prime of their working life, able to combine physical demands of cultivating seaweed and responsibilities in their own family. The respondents' age composition reveals that most of them are at the stage where they are excited to have stable livelihoods, take care of their households and invest in any opportunity that comes their way. Most farmers being male and married indicates the traditional nature of the coastal communities with men always being in the forefront to undertake hard labor especially fishing and other related fishing related activities, whereas women are always left back at home to support them by doing domestic work or other livelihood activities at home. This also means that most of the decisions made for seaweed production are family-based, as they work towards the needs and well-being of their family. In terms of educational attainment, most of the seaweed farmers are high school graduates that indicates that although they have educational foundation, most of them could not have had access to higher education due to geographical and financial constraints (Mengo et al., 2023). This condition does not mean of their limitations but rather the need for the training programs to be practicable, accessible and relating to their capacity. And this program would provide them with technical expertise, entrepreneurial skills and environmental awareness, without bombarding them with too much theory or an academic approach. Rajpurohit et al. (2023) in their study highlighted that capacity building should be recognized as a vital input in the knowledge, skills, and resources of agriculture sector for enhancing the productivity and as an important element in the process of sustainable development.

Moreover, the study indicates that most of the seaweed farmers get to know more information on meetings or seminars in their association. This result points to the relevant role of the local associations as centers of knowledge and support of the community. For many farmers, these not only act as a platform to collect technical updates and practical advice, but also a safe space to share experiences, raise concerns and learn from one another. Meetings and seminars provide the seaweed farmers with a more comfortable and relatable experience than that which they would get from information from faraway agencies or through digital means. It illustrates that farmers prefer more collective learning, in which information is not simply transferred, but discussed, clarified and adapted to farmers' actual situations (Juan et al., 2024). Kigatiira et al. (2018) reported that the farmers had an enhanced interpretation of the information transmitted through face-to-face meetings and conferences because they provided an enabling environment for the interaction of information. This has been substantiated by the results that the farmers would rather opt for a face-to-face training modality which reflects on their high dependency on personal interaction as well as hands-on training, which they perceived to be more effective and reproducible than the distance mode or digital mode. This is also their preferred modality because of constraints in internet connectivity. Findings suggest that most seaweed farmers still choose face-to-face training and seminars, which entails that this option is what works best for them right now. While it is good that the study looks toward the opportunity of improving online literacy, the capacity and available resources of the respondents shall be considered. The findings indicate that any capacity-building program should not rush to replace traditional learning methods. Instead, it should slowly introduce digital literacy while continuing to support the face-to-face approach that the farmers are currently relying on and comfortable to use with.

The results in this research about the seaweed farmers' inclination to a topic entitled "Your Seaweed, Your Business: Learning the Entrepreneur's Mindset" indicate a steadily increasing interest in the innovation and sustainability of their economic activity beyond the traditional production. This creates an interest in them to see their seaweed as more than a harvest crop but a business to expand. Under a range of economic

and environmental pressures, farmers and agro-food producers must build on their existing knowledge and experience, while at the same time, embedding innovation, sustainability, and efficient management as the central tasks of food production and land management (Gadanakis, 2024). This means taking stock of the fact that seaweed farming is not a mere production but a business which needs proper planning and leadership. Where this topic will address elements of financial management whose only zeal for judicious management of their income and their commitment to the stability of livelihoods, while their learning for organizational management suggests the appreciation they have for collective development and stable and sustainable community cooperation.

Lastly, the Local Government Unit and Provincial Government Office do not have any current projects or formal programs for the seaweed farmers; however, support and assistance in terms of financial assistance and provision of materials needed in farming is still being provided to them. This demonstrates an awareness on the part of the government regarding the importance of seaweed farming to the community's livelihood and economic development. Interestingly, farmers believe that government should support them by providing necessary resources to take their entrepreneurship to the next level (Phiri, 2021). However, the infrastructural lack of structured programs also indicates a lack of long-term development programs. While the above forms of intervention are required to maintain their functioning, farmers may benefit more from a holistic and ongoing capacity-building that goes beyond financial intervention, and focuses on skills, organization and sustainability.

The findings of the study are a strong foundation for development and implementing a capacity-building program, as the seaweed farmers are most likely capable, motivated, and open to learning. Tailoring the project to their educational level and building on their existing skills can enhance their productivity, promote sustainable seaweed farming practices, and entrepreneurship. At the same time, the result emphasized that even though some farmers are open to learning new things, they still prefer face-to-face learning due to their location and accessibility to resources needed for online learning. This suggests that online training should be gradually introduced with proper guidance and support, so that they would feel comfortable and confident in using it.

5. CONCLUSION

The results presented show the readiness of farmers to embrace growth and the need for structured, community-driven programs that will help them strengthen their skills, organizations, and long-term sustainability. Majority of the seaweed farmers are within the age range of 30-39 years old which means that this sector is largely driven by individuals in their prime working years, bringing with them both energy and experience. While male farmers dominantly contribute to the seaweed production as this work requires more of strong manly presence and also point to opportunities for encouraging more inclusive participation, especially among women, in the future of seaweed farming or other livelihood activities. Moreover, majority of farmers are already married, which has contributed further to their dedication to seaweed farming as primary source of income in the family. Lastly, most of the seaweed farmers have earned high school diplomas, which implies that a considerable portion of the farming community has attained a basic level of formal education. Seemingly, the farmers gather data or information from each other in their community as compared to their online access. Majority also found the topic “Your Seaweed, Your Business: Learning the Entrepreneur’s Mindset” the most relevant topic. Therefore, there is an open interest for seaweed innovation and entrepreneurship which could help them with additional sources of income and livelihood. Further, farmers always prefer face to face training because of their access to internet and other modalities since they are in a coastal rural area where internet connectivity is still their primary concern. Lastly, the Provincial Government Office and Local Government Unit of Magsaysay are helping hand in hand to improve the farmer’s quality of life and their seaweed production annually.

ACKNOWLEDGEMENTS

The completion of this research was made possible through the support and contributions of Occidental Mindoro State College and its RDE Unit, cited works of other researchers, and seaweed farmers.

REFERENCES

Busthanul, N., Diansari, P., Demmallino, E. B., Syafiuddin, M., Sulianderi, N. M. V., Sabaniah, H., Istianingsih, V., Syam, S. H., & Rahmawati, N. (2023). Development strategy of seaweed innovation product and marketing at UTARI cooperative, Bulukumba regency. *IOP Conference Series Earth and Environmental Science*, *1230*(1), 012011. https://doi.org/10.1088/1755-1315/1230/1/012011

Durrani, N., Raziq, A., Mahmood, T., & Khan, M. R. (2024). Barriers to adaptation of environmental sustainability in SMEs: A qualitative study. *PLoS ONE*, *19*(5), e0298580. https://doi.org/10.1371/journal.pone.0298580

Gadanakis, Y. (2024). Advancing farm entrepreneurship and agribusiness management for sustainable agriculture. *Agriculture*, *14*(8), 1288. https://doi.org/10.3390/agriculture14081288

Hurtado, A. Q., Critchley, A. T., & Neish, I. C. (2017). *Tropical seaweed farming Trends, problems and opportunities*. https://doi.org/10.1007/978-3-319-63498-2

Juan, R. S., Madarcos, J. R., Creencia, L., & Galon, F. (2024). Experiences and aspirations of seaweed farmers in Palawan, Philippines. *The Palawan Scientist*, *16*(1), 15–27. https://doi.org/10.69721/tps.j.2024.16.1.03

Kigatiira, K. K., Mberia, H. K., & Ngula, K. W. (2018). The effect of communication channels used between extension officers and farmers on the adoption of Irish potato farming. *International Journal of Academic Research in Business and Social Sciences*, *8*(4). https://doi.org/10.6007/ijarbss/v8-i4/4020

Mengo, E., Grilli, G., Murray, J. M., Capuzzo, E., Eisma-Osorio, R., Fronkova, L., Etcuban, J. O., Ferrater-Gimena, J. A., & Tan, A. (2023). Seaweed aquaculture through the lens of gender: Participation, roles, pay and empowerment in Bantayan, Philippines. *Journal of Rural Studies*, *100*, 103025. https://doi.org/10.1016/j.jrurstud.2023.103025

Phiri, Z. (2021). *Developing an Entrepreneurial Mindset in the Agriculture sector: A Case for Farm Owners in ESwatini* [MA Thesis, International University of Japan]. https://doi.org/10.13140/rg.2.2.24951.64168

Rajpurohit, T. S., Singh, D., & Kumar, R. (2023). Capacity building in Agricultre. In *Human Development : In Perspective of Agriculture* (1st ed., pp. 139–152). G. H. Publication.

Sultana, F., Wahab, M. A., Nahiduzzaman, M., Mohiuddin, M., Iqbal, M. Z., Shakil, A., Mamun, A., Khan, M. S. R., Wong, L., & Asaduzzaman, M. (2022). Seaweed farming for food and nutritional security, climate change mitigation and adaptation, and women empowerment: A review. *Aquaculture and Fisheries*, *8*(5), 463–480. https://doi.org/10.1016/j.aaf.2022.09.001

Wolniak, R., Gajdzik, B., & Grebski, W. (2023). Environmental sustainability in business. *Scientific Papers of Silesian University of Technology Organization and Management Series*, *2023*(175). https://doi.org/10.29119/1641-3466.2023.175.39

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