



Aquaculture facilities used by farmers in Barangay Day-asan, Surigao City, Philippines

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Abstract

The purpose of the study was to determine the aquaculture facilities used by the fish farmers in Barangay Day-asan, Surigao City, Philippines, and its effect to the fish farm production. This study utilized a survey questionnaire administered to aquaculture operators in the study area. The respondents were randomly selected, and data were collected through personal interviews and ocular inspections of the facilities. The collected data were analyzed using Statistical Package for Social Sciences (SPSS). The results showed that aquaculture farming in the study area was predominantly carried out by males. A significant proportion of older individuals above 50 years old remained active in the industry. The majority of the respondents were married, indicating that fish farming was often pursued as a livelihood activity within families. Practical experience and traditional methods played a significant role in fish farming practices, as many respondents had lower levels of formal education. Most of the fish farmers were full-time and engaged in intensive aquaculture, particularly in lobster culture. The farmers' choice of fish species was not significantly influenced by their years of farming experience, but their management options were significantly affected by their experience. The type of culture facility used did not significantly impact fish farm production, suggesting that similar production levels could be achieved with different facility choices.

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Introduction

Philippine Fisheries is recognized as one of the leading producing countries in the globe. In 2018, the Philippines contributed 1.89 million MT (2% of marine capture production) to global fish production, ranking 13th globally. Similarly, the Philippines is the world's fourth-largest producer of seaweeds (FAO, 2020).

Among the three types of fisheries in the Philippines: aquaculture, municipal fisheries, and commercial fisheries, aquaculture accounted for around 53% of total production in 2018, with 2.3 million metric tons, with seaweeds, milkfish, tilapia, and shrimp/prawns being the top cultivated species. Municipal fisheries supplied 1.1 million metric tons to total output, accounting for 25% of total production, whereas commercial fisheries contributed 946 thousand metric tons, accounting for 22% of total fisheries production (BFAR, 2019; PSA, 2019).

Aquaculture contributes significantly to total fishing productivity in the country. In comparison to the municipal and commercial fisheries sectors, it is the lone sector that has seen continual development (Aypa & Bacongus, 2000; BFAR, 2019). It makes an important contribution to the country's food security, employment, and foreign exchange revenues (FAO, 2023).

Surigao City's Barangay Day-asan is famous for its wooden cottages on stilts. It is best renowned for its floating village. It is known as the "Little Venice" for this reason. The area is also well-known for its thriving aquaculture business. Because of the consistent and high-quality output of aquaculture products, fishermen have a stable source of income. It is a perfect location for innovative low-income families to raise lobsters. Indeed, many people raise lobsters just beneath their kitchen sinks (Rodriguez, 2015). The Philippine fishing sector is an important contributor to the national economy, generating foreign cash and providing a living for around 2 million Filipino fishermen (Tahiluddin and Terzi, 2021).

There is little information on the impact of aquaculture facilities on fish production output in Barangay Day-asan, Surigao City, therefore the need

for this study. The primary goal of this research was to determine the aquaculture facilities used and its effect on the fish farm production in the study area.

Material and methods

Study Area

This study was carried out in the eight zones of Barangay Day-asan, Surigao City, Philippines wherein one of the main sources of livelihood is fish farming. Its geographical coordinates are at approximately 9.7726, 125.5508 (9° 46' North, 125° 33' East. Elevation at these coordinates is estimated at 25.4 meters or 83.3 feet above mean sea level: (Phil Atlas, 2023)

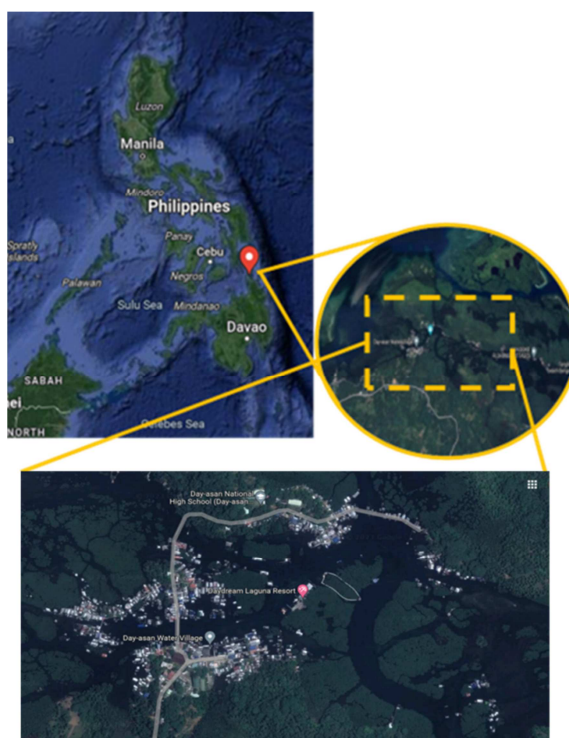


Fig. 1. Map showing the study area in Barangay Day-asan, Surigao City.

Respondents and Sampling Procedure

The respondents in this research were randomly selected from the aquaculture operators among the eight zones of Barangay Day-asan, Surigao City, Philippines.

Research Instrument

A survey questionnaire was administered in the eight zones of Barangay Day-asan, Surigao City, Philippines. Barangay Day-asan, Surigao City was purposively selected for this study based on the

concentration of farming activities in the area. Before the study was conducted, the researchers discussed the planned sampling activities with the Barangay chairman and prior informed consent was granted. The respondents were interviewed following the corrected survey questionnaire. Validations were done through personal interviews and ocular inspection at the culture facilities.

Statistical Analysis

Data obtained from the study area was carefully analyzed using the Statistical Package for Social Sciences (SPSS). Results were presented using descriptive statistics such as percentages and frequencies, and One-way ANOVA to determine the significant differences between variables.

Results and discussions

Socio-economic Characteristics of the Fish Farmers

As shown in Table 1, 56.5% of the respondents are males. This may be linked to the exhausting nature of the job of fish farming. The results also revealed that most of the respondents were above 50 years old (45.6%), followed by age between 41-50 years who are 28.3%, while 17.4% and 8.7% are within the age range of 30-40 and below 30 years respectively. This implies that a higher proportion of the respondents still choose to continue working and remain active in the industry despite their old age.

Most of the respondents are married (91.3%), while 4.35% are single and 4.35% are widower/widow. Most of the farmers are elementary graduates (34.8%) while 26.1% are in high school level and few were able to attend and graduated from colleges only. It can also be seen in the table that most of the respondents are full-time farmers (63%) while 37% are part-timers. The result is an indication that most of the farmers can constantly monitor their fish farming facility and respond to any issues that may arise.

The result (Table 1) also shows that 52.2% of the farmers had 1-5 years of farming experience, 19.6% had farming experience between 6-10 years and only 17.4% did farming for above 16 years. This implies

that most of the respondents may still be in the early stages of establishing their operations.

Table 1. Demographic /socio-economic characteristics of the fish farmers.

Category		Frequency	Percent
Gender	Male	26	56.5
	Female	20	43.5
	Total	46	100.0
Age	<30	4	8.7
	30-40	8	17.4
	41-50	13	28.3
	>50	21	45.6
	Total	46	100.0
Marital Status	Single	2	4.3
	Married	42	91.3
	Widow/Widower	2	4.3
	Total	46	100.0
Level of Education	Elementary level	3	6.5
	Elementary graduate	16	34.8
	High school level	12	26.1
	High school graduate	9	19.6
	College level	2	4.3
	College graduate	4	8.7
	Total	46	100.0
Farming Status	Full-time	29	63.0
	Part-time	17	37.0
	Total	46	100.0
Years of farming	> 1 year	3	6.5
	1-5 years	24	52.2
	6-10 years	9	19.6
	11-15 years	2	4.3
	Above 16 years	8	17.4
Total	46	100.0	

Fish Farm Production Information

Table 2 shows that 69.6% of the respondents cultured lobsters, while 26% cultured langog fish (*Alepes macrurus*) and a negligible 2.2% of the respondents are rearing milkfish and grouper fish.

This is an indication that lobsters were the most cultured in the study area. This may be due to their high prices in the market and higher yields compared to relying solely on wild catches. Many of the fish farmers practiced intensive aquaculture (60.9%), 32.6% practiced semi-intensive system; while 6.5% practiced extensive aquaculture, thus the study area was dominated by intensive culture system. This is maybe for the farmers to maximize their production and have better control over the facility.

Type of Culture Facility Used

A shown in Table 3, majority of the respondents used cage culture (97.8%) to culture their fishes while only

2.2% used concrete tanks. This implies that most respondents prefer to use cages compared to other facilities in the study area. This may be because cages are typically situated in open water bodies, which provide a constant flow of water and help maintain optimal environmental conditions for fish growth and health.

Table 2. Fish farm production

	Category	Frequency	Percent
Type of fish cultured	Lobster	32	69.6
	Langog Fish (<i>Alepes macrunus</i>)	12	26.0
	Milkfish (Bangus)	1	2.2
	Grouper fish (Lapu-lapu)	1	2.2
	Total	46	100.0
Management option	Intensive	28	60.9
	Semi-intensive	15	32.6
	Extensive	3	6.5
	Total	46	100.0

Table 3. Type of Culture Facility Used.

Type of Culture Facility	Frequency	Percent
Concrete tank	1	2.2
Cage culture	45	97.8
Total	46	100.0

On Significant Difference between Fish Farm Production and Years of Farming

Table 4 shows that the p-value is greater than 0.05 level of significance when types of fish cultured was grouped to years of farming. Thus, the null hypothesis

Table 4. Significant Difference between Fish Farm Production and Years of Farming.

Variables	F value	p-value	Decision	Interpretation	
Years of Farming	Types of Fish Cultured	2.821	.094	Do not Reject H ₀	Not Significant
	Management Option	4.201	.004	Reject H ₀	Significant

Table 5. Significant Difference between Fish Farm Production and Type of Culture Facility Used.

Variables	F value	p-value	Decision	Interpretation	
Type of Culture Facility Used	Types of Fish Cultured	1.254	.287	Do not Reject H ₀	Not Significant
	Management Option	1.510	.222	Do not Reject H ₀	Not Significant

Conclusion

In conclusion, the aquaculture farming in the study area was dominated by males. A significant proportion of respondents, particularly those above 50 years old, choose to continue working and remain active in the industry. The majority of them were married. A considerable portion of the fish farmers were elementary graduates. Most of the respondents

is rejected, this means that there is no significant difference between fish farm production in terms of type of fish cultured when grouped to years of farming. Furthermore, this suggests that the years of farming experience may not have a strong influence on the choice of fish species or the productivity of the fish farms. Moreover, the p-value is less than 0.05 level of significance when management option was grouped to years of farming. Thus, it is not safe to reject the null hypothesis, this means that there is significant difference between fish farm production in terms of management option when grouped to years of farming. Further, this indicates that the years of farming experience can have a notable impact on the choice of management practices and the resulting production outcomes.

On Significant Difference between Fish Farm Production and Type of Culture Facility Used

Table 5 shows that the p-values are greater than 0.05 level of significance when fish farm production was grouped to type of culture facility used. Thus, the null hypothesis is rejected. This means that there is no significant difference between fish farm production and the type of culture facility used. Moreover, this indicates that the choice of culture facility may not have a substantial impact on the overall productivity of fish farms.

were full-time farmers, allowing them to constantly monitor their fish farming facilities and address any issues promptly. Lobster culture was the predominant activity among the respondents, likely due to its higher market value and potential for increased yields. Most respondents had moderate levels of production experience, ranging from 1-5 years. The study area was dominated by intensive aquaculture

systems, where farmers aim to maximize production and have better control over their facilities. Cage culture was the preferred method among the respondents, possibly due to the benefits of open water bodies providing optimal environmental conditions for fish growth.

The statistical analysis indicated that the type of fish cultured was not significantly influenced by the years of farming, suggesting that farmers maintain consistent fish species preferences regardless of their experience. However, the choice of management option was significantly affected by the years of farming. This implies that farmers' decision-making regarding management practices evolves and becomes more informed as they gain experience in the industry. The type of culture facility used did not significantly influence fish farm production, which indicates that farmers can achieve similar levels of production regardless of the specific facility chosen for fish farming. Overall, these conclusions provide insights into aquaculture facilities, production practices, and fish species preferences within the studied fish farming community.

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