Asian Journal of Aquatic Sciences, December 2025. Vol 8, Issue (3) 478-483
e-issn: 2716-4608
p-issn: 2655-366X

DIVERSITY OF ECONOMICALLY VALUABLE FISH TYPES IN THE LUBUK LARANGAN AREA, THE BATANG BUNGO RIVER, BUNGO REGENCY, JAMBI

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ABSTRACT

The diversity of economically valuable fish species in the Batang Bungo River is crucial for assessing the condition and population, which is the foundation for sustainable capture fisheries in the future. The research aims to identify the economic value of the Batang Bungo River and the diversity, dominance, and relative abundance of economically valuable fish. The research method involved a survey, and data were collected using a purposive sampling technique based on various environmental characteristics and fishing areas commonly used by local fishermen. These fishermen caught 15 people per station. Eight species of economically valuable fish were found in the Batang Bungo River. The diversity values in the upstream (2,049) and downstream (1,933) sections were categorized as moderate. Dominance Index of upstream (0.13: downstream section: 0.15) (medium). The highest relative abundance was found in seluang (*Rasbora argyrotaenia*) (relative value: 15,95%) and baung (*Mystus nemurus*) (relative value: 15,65%).

Keywords: Diversity, Economic Fish, Batang Bungo, Jambi

1. INTRODUCTION

The Batang Bungo River is one of the rivers in Bungo Regency, Jambi Province, according to Hertati[1], the community uses the Batang Bungo River for fishing, agriculture, plantations, the local water company (PDAM), and the Lubuk Larangan area. The waters of the Batang Bungo River are a freshwater ecosystem that plays an important role in supporting the community, especially those living along its banks. It is one of the rivers with a relatively large potential fish resource. It is used by the local community as a source of livelihood, both for household consumption and as an economic commodity.

The fish in the Batang Bungo River have significant economic value, especially endemic and local species that are in high demand in traditional and regional markets. Some types of economic fish, such as *Hemibagrus nemurus* (Baung), *Pangasius* sp. (Patin), and *Channa striata* (Gabus), are known to have high market value and are the primary targets of local fishing activities[2]. However, these fish are currently threatened by various factors, including overfishing. Water pollution and habitat degradation due to human activities, including mining and changes in land use, in the Batang Bungo River Basin (DAS).

Studies on the diversity of economically valuable fish species in the Batang Bungo River are important to conduct to determine the current condition of the population and the diversity of these fish and as a basis for sustainable fisheries resource management. Furthermore, this information can support conservation policies and empower local communities to sustain river ecosystems. This study aims to identify the types of economically valuable fish found in the Batang Bungo River, their diversity and dominance, the relative

Received: 1 November 2025
Accepted: 31 December 2025

abundance of economically valuable fish, the fish caught by fishermen for the sustainability of capture fisheries, and the preservation of fish resources in the Lubuk Larangan area of the Batang Bungo River.

2. RESEARCH METHOD

Time and Place

The research was conducted for 2 months, namely starting from June 2025 – July 2025, The research location of the Batang Bungo River, the research station is divided into two parts, namely the upstream part in Rantau Pandan Hamlet where the upstream part contains the Lubuk Larangan area and the downstream part of Tebat Hamlet contains the activities of the C and B mining communities. Figure 1.

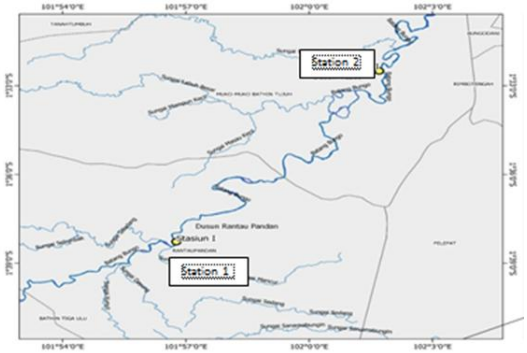

Figure 1. Map of research location

Methods

The research method used a survey. Data are collected using purposive sampling techniquesbased on different environmental characteristics and fishing areas commonly used by local fishermen, who catch 15 people per station. Meanwhile, the data used are primary and secondary. Secondary data is collected by reviewing scientific journals or local fisheries service reports, among others. Meanwhile, primary data were collected from the fish catch and the selling price of fish by fishermen in the upstream and downstream parts of the Batang Bungo River as determined.

Data Analysis

The data obtained will be analyzed descriptively, especially to identify the types of fish obtained using the taxonomy book guide and the fish identification key volumes I and II[3], and the freshwater fish identification book. Analysis of the Species Diversity Index (H'). The diversity index (H') is a description of the richness of fish species, which can be seen from the presence of the Number of species in a community with relative abundance. To determine the diversity of fish species, the Shannon-Wiener index is used[4], with the formula:

$$H' = -\sum pi \ln pi$$

Description:
H' = Shannon-Wiener diversity index;
ni = Number of individuals of species i;
N = Number of individuals of all species;
Pi = Proportion of individuals of type I.

The index obtained is then entered into the diversity criteria H' value > 3 = high diversity; H'1-3 value = moderate diversity; H' value < 1 = low diversity. Meanwhile, to determine dominance, the Simpson Dominance Index is used[5].

$$C = \sum \left(\frac{ni}{N}\right)^2$$

Description:
C = Simpson's dominance index.
ŋi = Number of individuals of the 1st species;
N = Number of individuals of all species.

The dominance index value ranges from 0 to 1, with the following categories: Index 1 = very high species dominance. Index 0 = no one dominates.

The relative abundance of each fish species was calculated using a numerical percentage:

$$Kr = \left(\frac{ni}{N}\right) \text{ x } 100\&$$

Description:
Kr = Relative Abundance;
ni = Number of individuals of the i-th species;
N = Total Number of individuals of all species

3. RESULT AND DISCUSSION

The results of a 2-month study on the diversity of economic intoally important fish species yielded 671 individuals, identified as 8 species at the observation station. The

Number of fish caught in the upstream section was 356, while in the downstream section, 315. This is shown in Table 1.

Number of economically valuable fish caught at station I (upstream) was 356 individuals, and at station II (downstream) was 315 individuals, and the Number of economically valuable fish caught was 8 types. In the upstream section, the most caught were semah (56 individuals) and seluang (60 individuals). At station II (downstream), the most caught were baung (65 individuals) and snakehead (55 individuals). Baung is one of the economically important fish sought after by the people of Bungo Regency for its delicious meat and is still found in abundance in the Batang Bungo River.

Table 1. Types of fish with economic value caught in the Batang Bungo River

No	National/Latin Name	Regional Name	Station I	Station II	Price
1	Baung Sungai (*Mystus nemurus*)	Baung	40	65	80.000
2	Gabus (*C. striata*)	Bujuk	35	55	60.000
3	Semah (*Tor soro*)	Semah	56	5	60.000
4	Patin (*P. pangasius*)	Patin	45	43	60.000
5	Senggiring (*Mystus singaringan*)	Senggiring	25	15	50.000
6	Lampam (*Barbonymus schwanenfeldii*)	Lanpam	45	50	45.000
7	Seluang (*Rasbora argyrotaenia*)	Seluang	60	47	60.000
8	Motan (*Thynnichthys thynnoides*)	Lambak	50	35	50.000
	Amount		356	315	

The downstream section has a water depth of 4 meters and a brightness level of 50 cm, one of the habitats for *M. nemerus*. Upstream, 56 individuals of semah were found; downstream, 5 upstream, there are conservation areas, *Lubuk larangan*, and Lubuk Manik reserves. Hertati et al.[6] stated that in the *Lubuk larangan* area of the utilization zone in the Batang Bungo River, semah fish were found at every station. Semah is one type of fish whose seeds are spread into the river, especially conservation areas and reserves by the relevant agency.

Economic Fish Species Diversity Index

The diversity index of economically important fish species in the Batang Bungo River was calculated using the diversity index[7]. The calculation results for each station are shown in Table 2.

Table 2. Economic fish species diversity index at Stations I and 2

No	Station	H'	Category
1	I (Upstream)	2,049	Medium
2	II (Downstream)	1,933	Medium

As seen from Table 2, the fish species diversity index (H') upstream of station 1 has an index value of 2.049 (moderate category). It is downstream of station 2, which has an index value of 1.933 moderate category). When viewed in terms of the diversity of economic fish species at the 2 stations, it is categorized as moderate. The low or moderate level of fish diversity in a body of water can be influenced by various community activities along the river. Community activities in the Batang Bungo River currently include B excavation, C excavation, fishing, agriculture, plantations, and aquaculture.

Human activities can influence the diversity of fish species in their habitat8. Good environmental conditions and habitats are very supportive of all types of fish living and reproducing. The community of diverse fish species is an aquatic resource that can be mined, especially those with economic value beneficial to human life[9]. The composition and diversity of fish species are greatly influenced by factors such as food availability[10]. Low species diversity is associated with a low uniformity index and the dominance of a single species.

Dominance Index

Dominance describes the level of dominance of a species over other species in an area, which results in a low diversity index value. To determine the dominance value of fish species in waters, the Simpson dominance index is used[11]. The dominant fish species in the Batang Bungo River are shown in Table 3.

Table 3. Dominance index of economically valuable fish species in the Batang Bungo River

No	Station	Dominance index	Category
1	I	0.13	Medium
2	II	0.15	Medium

The dominance index for economically valuable fish species at station I (Upstream) was 0.13, and at station II (Downstream), it was 0.15, both in the low dominance category. The low dominance index is due to the absence of a dominant fish species at each station. According to Odum[12], the smaller the dominance index value, the more it indicates that there is no dominant species; conversely, the greater the dominance, the more it indicates that a particular species is dominant.

The low dominance index value may be influenced by community activities that cause water turbidity. One factor influencing the turbidity level in the Batang Bungo River is the presence of mining activities (PETI) and mining activities (C). Water turbidity is the amount of suspended solids in water, and its level indicates competition for resources and unbalanced or stressed aquatic environmental conditions.

Relative Abundance

The calculation of the relative abundance of economically valuable fish species is based on the equation presented by Samad et al.[7], shown in Table 4.

Table 4. Calculation of the relative abundance of economically valuable fish in the Batang Bungo River

No	National / Latin Name	Total Number of stations I and II	Relative abundance
1	Baung Sungai (*M.nemerus*)	105	15. 65 %
2	Gabus (*C.striata*)	90	13. 41 %
3	Semah (*T.soro*)	61	9. 09 %
4	Patin (*P. pangasius*)	88	13. 11 %
5	Senggiring (*M. singaringan*)	40	5. 96 %
6	Lampam (*B. schwanenfeldii*)	95	14. 16 %
7	Seluang (*R.argyrotaenia*)	107	15. 95 %
8	Motan (*T. thynnoides*)	85	12. 67 %
	Amount	671	100.00 %

Table 4 explains that there are 105 baung with a percentage of 15.65%, then 90 snakehead (13.41%), then 60 semah with a percentage of 9.09%, then 88 patin fish with a percentage of 13.11%, after that 40 senggiring with a percentage of 5.96%, 95 lampam with a percentage of 14.16%, after that 107 seluang fish with a percentage of 15.95%, and 85 motan with a percentage of 12.67%. The highest relative abundance is in seluang at 15.95%, and the lowest is in Senggiring at 5.96%. Factors influencing species abundance include habitat preference, which allows certain species to be found in one location but not in another[13]. Furthermore, species abundance is also influenced by substrate, salinity, ability to withstand currents and waves, food availability, and environmental protection[14-16].

4. CONCLUSION

The *M.nemurus* species has the highest economic value, and seluang has the highest volume. Moderate species diversity (H'1-3), low dominance, and relative abundance of 15.95% were found in Seluang, and fish with special economic

value in the Bungo district were found in *M.nemurus*. There is a need for zone-based fishing management and Education for fishermen regarding environmentally friendly fishing gear

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