

Water Quality Conditions and Effectiveness of Management of Lubuk Larangan in Bandur Picak Village, Kampar

Kondisi Kualitas Perairan dan Efektivitas Pengelolaan Lubuk Larangan Desa Bandur Picak Kabupaten Kampar

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Abstract

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Lubuk Larangan is a part of the river that has been used as a protected area for native fish resources in a particular area through traditional rituals. This research aims to analyze the water's physical and chemical parameters and assess the effectiveness of managing Lubuk Larangan in the Kampar River, Bandur Picak Village. This research was carried out from March to April 2024 in Lubuk Larangan, Bandur Picak Village. Data collection in this research used a survey method. The research location is divided into four observation station points: upstream non-Lubuk Larangan, Lubuk Pinang, Lubuk Batu Patah, and downstream non-Lubuk Larangan. The results of this research show that the water quality conditions, namely physical and chemical parameters, are still by river water quality standards with an average temperature of 24.97°C, brightness of 47.18 cm, current speed of 0.43 m, TDS 84.74 mg/L, depth of 2.36 m, pH 5, DO 7.33 mg/L, nitrate 0.05 mg/L, and phosphate 0.06 mg/L. The interview results on the effectiveness of the management of lubuk larangan conducted during the research were divided into three criteria: the criteria, management, and accommodation for lubuk larangan. The data shows that the management of lubuk larangan is included in the practical category.

Keywords: Bandur Picak Village, Chemical Physics, Lubuk Larangan

Abstrak

Lubuk larangan merupakan bagian sungai yang dijadikan kawasan lubuk larangan sebagai kawasan lindung sumber daya ikan asli suatu daerah tertentu melalui ritual adat. Penelitian ini bertujuan untuk menganalisis parameter fisika dan kimia air serta menilai efektivitas pengelolaan lubuk larangan di Sungai Kampar Desa Bandur Picak. Penelitian ini dilaksanakan pada Maret s/d April 2024 di Lubuk Larangan Desa Bandur Picak. Pengumpulan data pada menggunakan metode survei. Lokasi penelitian yang dibagi menjadi empat titik stasiun pengamatan yaitu hulu non lubuk larangan, Lubuk Pinang, Lubuk Batu Patah, dan hilir non lubuk larangan. Hasil dari penelitian ini menunjukkan kondisi kualitas perairan yaitu parameter fisika dan kimia masih sesuai dengan standar baku mutu air sungai dengan rata-rata suhu 24,97°C, kecerahan 47,18 cm, kecepatan arus 0,43 m, TDS 84,74 mg/L, kedalaman 2,36 m, pH 5, DO 7,33 mg/L, nitrat 0,05 mg/L, dan fosfat 0,06 mg/L. Hasil wawancara efektivitas pengelolaan lubuk larangan yang dilakukan selama penelitian terbagi menjadi tiga kriteria yaitu kriteria lubuk larangan, pengelolaan lubuk larangan, dan akomodasi lubuk larangan. Data yang diperoleh menunjukkan bahwa pengelolaan lubuk larangan termasuk dalam kategori cukup efektif.

Kata kunci: Desa Bandur Picak, Fisika Kimia, Lubuk Larangan.

1. Introduction

Bandur Picak Village is one of the villages in Koto Kampar Hulu District, Kampar Regency. This village has a population of 3,730 people with a village area of 20,500 km², of which 45% is hills, while the rest is agricultural land (second crops) and plantations (gambir, orange, cocoa, rubber, and oil palm). Apart from farming and plantation activities, this village also uses the waters of the Kampar River for bathing, washing, latrines (MCK), and capture fisheries activities, with the target catch being *Tor tambroides*, *Hampala macrolepidota*, *Hemibagrus nemurus*, and *Epalzeorhynchus kalopterus* (Yunus, 2020). Continuous fishing will result in overfishing and a decline in fish stocks. The community applies Local Wisdom in this village to anticipate a decline in fish stocks. Local wisdom is a custom passed down from generation to generation by a community to maintain its existence so that it does not disappear or fade over time. One of the local traditions in Bandur Picak Village is Lubuk Larangan (Henri et al., 2018).

Lubuk Larangan is a part of the river that has been used as a protected area for native fish resources of a particular area through traditional rituals. The community's strategy in managing the forbidden area aims to maintain the habits and customs of their ancestors so that they do not become extinct. In this way, whether they realize it, they try to maintain environmental balance and protect the environment (Putri, 2016). Lubuk Larangan in Bandur Picak Village is 2 km long and 1-3 m deep. In this village there are two lubuks, namely Lubuk Batu Patah and Lubuk Pinang. Each hole is marked with a boundary in the form of a white rope, which indicates that local people are prohibited from fishing. Before the fasting month, people are prohibited from fishing for two years. The opening of Lubuk Larangan was held after the Eid al-Fitr holiday. Fishing time for one month. Usually, the opening procession of Lubuk Larangan begins with the recitation of a joint prayer, Surah Yasin, which is led by Lubuk Larangan religious figures. Equipment for catching straightforward fish, such as nets, traps, shoots, etc. The types of fish found were native river fish, *T.tambroides*, *H.macrolepidota*, *H.nemurus*, and *E.kalopterus* (Yunus, 2020).

This research aims to analyze water's physical and chemical parameters and assess the effectiveness of managing lubuk larangan in the Kampar River, Bandur Picak Village.

2. Material and Method

2.1. Time and Place

This research was conducted from March to April 2024 at the Lubuk Larangan River, Bandur Picak Village. Physical-chemical water quality measurements were carried out directly in the field. The location map is shown in Figure 1.



Figure 1. Map of research location

2.2. Methods

The method used in this research is a survey method located in Lubuk Larangan, Bandur Picak Village. Determining the research location points uses the purposive sampling method, namely determining the sampling points according to which the required data can be represented. The location point is divided into four stations: Station One is in the upstream part of Lubuk Larangan, Station Two is in Lubuk Pinang, Station Three is in Lubuk Batu Batah, and Station Four is downstream of non-lubuk Larangan.

2.4. Data Analysis

This research uses a qualitative approach with descriptive data analysis and results from observations and interviews. According to PP, physical and chemical parameters have been measured and compared using river water quality standards (Mulyani et al., 2023). Quality Standards can be seen in Table 1.

Tabel 1. Water quality parameters

Water quality parameters	Quality standards
Physics Parameters	
Temperature (m)	26–29*
Brightness (cm)	49**
Current speed (m)	0,41 –2,03**
Depth (°C)	1 – 3
TDS	1.000*
Chemical Parameters	
pH (unit)	6–9*
Dissolved Oxygen (mg/L)	7-8**
Nitrate (mg/L)	0,06*
Phosphate (mg/L)	0,02*

The assessment of the effectiveness and management of lubuk larangan will refer to the 2017 Guidebook for Assessment of the Effectiveness of Conservation Area Management in Indonesia, where the final results are calculated using the formula:

$$Total = \frac{Maximum\ Skor}{Total\ Skor} \times 100\%$$

3. Result and Discussion

3.1. Bandur Picak Village Facilities and Infrastructure

Bandur Picak Village's public facilities and infrastructure include the village office, market stall, multi-purpose building, health center, mosque, kindergarten, elementary school, middle school, high school, and Islamic boarding school. Table 2 details the number of facilities.

Table 2. Facilities and Infrastructure

Facilities and Infrastructure	Unit	Condition
Village Office	1	Good
Market Stalls	6	Not good
Multi-purpose buildings	1	Good
Health centers	1	Good
Mosques	3	Abandoned
Prayer rooms	8	Not good
Kindergarten	2	Incomplete
SD	3	Not good
SMP	1	Good
SMA	1	Good
PondokPesantren	1	Good
Total	28	

3.2. Livelihoods of Bandur Picak Village

Farmers (80%) comprise the majority of this village's population. In detail, the composition of the population of 2236 people based on livelihoods is presented in Table 3.

Table 3. Population composition according to livelihood

Type of Job	Number (people)	(%)
Farmers	1800	80,50
PNS	35	1,57
Private implore	15	0,68
Police	6	0,26
Farm workers	350	15,65
Livestock breeders	6	0,27
Traders	20	0,90
Mechanics	4	0,17
Numbers	2236	100

Table 3 shows that agricultural workers (15.65%) are second after farmers and third as civil servants (1.57%), and other livelihoods are below 1%. No one works in the fisheries sector of this population, even though the Kampar River crosses this village.

3.3. Governance of the Lubuk Larangan

Lubuk Larangan is where the river has a maximum depth of 2 – 3 meters. This place has been deliberately chosen and is liked by big fish. This area can only be harvested based on a customary deliberation decision. Lubuk Larangan in Bandur Picak Village emerged or was founded in 1978; this tradition was deliberately developed at the indigenous community level because it is very beneficial for indigenous communities who live along the Kampar River. Bandur Picak Village is in Kampar Hulu, Kampar Regency, Riau Province.

The basic aim of management is to sustainably improve the welfare of the entire community, especially local communities living in water bodies (rivers). The management of this lubuk larangan is prominent and strict. Regulations are prepared based on mutual agreement, so they are not absolute, can be changed according to mutual needs, passed down from generation to generation, followed by all descendants of the community, and become local wisdom. Sanctions or actions imposed on people who violate regulations, rules, and decisions. Based on the results of an initial review of the determination of Lubuk Larangan in villages in Bandur Picak Village, anyone who violates the prohibition intentionally or secretly is violating the rules that have been established. If anyone breaks the rules, they will be punished with a distended stomach that will not heal and can result in death for the offender.

Along with religion or belief in the mystery of this lubuk larangan, several myths state that since this lubuk larangan was designated as a lubuk larangan, more and more fish have appeared in the deep lubuk larangan, and the fish in the deep lubuk larangan will no longer be able to come out. During the dry season, people begin to know that the harvest will arrive, usually around June, July, or August. By looking at the physical condition of the lubuk larangan and the size of the fish to be caught (Dani et al., 2016). The Lubuk larangan harvest period in Bandur Picak village was last June. The Head of Bandur Picak Village explained that before carrying out harvest activities or the Mancokau Lauk tradition, an inter-tribal deliberation was first held in Bandur Picak village. In Mancokau traditional culture, side dishes are determined based on the day, harvest schedule, and implementation committee; the traditional authority holder, Ninik Mamak, decides all of this.

The equipment used to catch fish in Lubuk Larangan, Bandur Picak Village, is simple equipment commonly used by Indigenous people, such as fishing rods, traps or traps, nets, and bamboo poles. These tools are made from organic natural materials such as wood, rattan, and tree roots, not iron, nails, wire, or other dangerous materials. In Bandur Picak Village, it is prohibited to catch fish of all sizes; the fish that can be caught for eating is large, namely a minimum of 4 fingers or 250 g/fish. This prohibition aims to ensure that small fish are allowed to grow up and be able to lay eggs. Additionally, catching larger fish has delicious and tastier meat so that the fish in these waters do not run out or their regeneration is interrupted.

3.4. Water Quality in the Lubuk Larangan Bandur Picak Village

The water quality parameters measured in this research are physical and chemical. Physical parameters include temperature, brightness, current speed, depth, and TDS. Chemical parameters include pH, DO, nitrate, and phosphate. The results of the water quality measurements of physical and chemical parameters can be seen in Table 4.

Table 4. Average water quality measurements in the Lubuk Larangan area of Bandur Picak Village

No.	Parameters	Average	Station				Unit	S.Quality Standard
			1	2	3	4		
1	Temperature	°c	23,37	25,50	25,50	25,52	24,9725	26-29
2	Brightness	Cm	46,75	46,75	48,25	47	47,1875	-
3	District Current	M	0,46	0,41	0,41	0,46	0,435	-
4	TDS	mg/L	84,60	84,25	85,25	84,87	84,74	1.000
5	Depth	M	2,00	2,57	2,57	2,30	2,36	-
6	pH	Unit	6	6	6	6	6	6-9
7	DO	mg/L	7,32	7,37	7,37	7,27	7,33	3
8	Nitrate	mg/L	0,05	0,06	0,05	0,06	0,05	0,06
9	Phosphate	mg/L	0,05	0,07	0,06	0,07	0,06	-

That the temperature of the environmental conditions at stations one to four is 23.37-25.52 oC, the brightness at stations one to station four is 46.75-48.25 cm, the current speed at stations one to station four, namely 0.41-0.46 m, TDS at station one to station four is 84.25-85.25 mg/L, depth at station one to station four is 2.00-2.57 m, pH at stations one to station four is five units, DO at stations one to station four is 7.27-7.37 mg/L, nitrate at stations one to station four is 0.05 -0.05 mg/L and phosphate at station one and station four is 0.05-0.07 mg/L. Overall, the differences in the values of each parameter between stations are still minor.

3.5. Lubuk Larangan Criteria

The low legal status and conservation regulations of the Lubuk Larangan area are due to 40% of interview respondents stating that they were still in the process of obtaining legal status; even though the protected area regulations have many provisions, there are still significant deficiencies. According to the agreement reached at the last review, the public is reminded not to violate the deal. The agreement aims to maintain and develop the sustainability of fish stocks through fishing holes for the local community. The current regulation of fishing holes is that fishing can only be done once every two years after the Eid al-Fitr holiday. This rule applies to everyone in Bandur Picak Village and people outside the village.

Analysis of the criteria for prohibited pits based on legal status, conservation area regulations, and the main objectives of the conservation area. Details can be seen in Table 5.

Table 5. Criteria for prohibited holes

Issue	Criteria	Percentage (%)	Score Value
1. Status	0. Has no legal basis	60	-
Law	1. There is an agreement that must be legally enforced but the process has not yet begun	-	-
Region			
Conservation	2. In the process of obtaining legal status	40	4
	3. Has formal legal status	-	-
2. Regulations	0. There are no rules	60	-
Region	1. There are still some weaknesses or Gap	-	-
Conservation	2. Here are several regulations control usage arebut it still exists major shortcomings	40	4
	3. There are regulations	-	-
3. Main Objective	0. There are no agreed objectives yet	40	-
Region	1. Have a goal but don't yet managed according to this aim	-	-
Conservation	2. Have goals but only fulfill some of Them	-	-
	3. Have a goal and have done it fulfill all these goals	60	9
TOTAL			17

3.6. Lubuk Larangan Management

The management of Lubuk Larangan in Bandur Picak Village remains in the hands of village officials and the local community. Management is carried out by determining protected area boundaries, management plans, conservation systems, and management processes. Table 6 details the management of Lubuk Larangan, Bandur Picak Village.

Table 6. Management assessment of Lubuk Larangan

Issue	Criteria	Percentage (%)	Score Value
1. Area Boundaries	0. Unknown to authorities management or local residents	-	-
Conservation	1. Known to management authorities but unknown to local residents	-	-
	1. Known to management authorities and local residents as appropriate but not confirmed	40	4
	2. Known by the management authority and local residents and confirmed	60	9
2. Plan Management	0. There is no management plan for the conservation area	-	-
	1. Management plans have been prepared but have not been implemented	-	-
	2. It has been prepared but only partially implemented	40	4
	3. Exists and has been implemented	60	9
3. System Protection	0. None	-	-
	1. Only partially effective resource use	-	-
	3. Moderately effective in resource use	20	2
	4. All effective in use resource	80	12
4. Management Resource	0. Resource management no done	-	-
	1. Very few activities are carried out for Management	-	-
	2. Many activities are carried out for management	40	4
	3. Management is being fully implemented	60	9
TOTAL			53

The management of Lubuk Larangan in Bandur Picak Village remains in the hands of village officials and the local community. Management is done by determining protected area boundaries, plans, conservation systems, and management processes. According to 40% of respondents, management authorities and residents know the boundaries of protected areas accurately. 60% of respondents stated that the management plan had been implemented. 80% of respondents said that the conservation system utilized fish resources effectively. 60% of respondents indicated that resource management had been fully implemented to manage fish resources.

3.7. Lubuk Larangan Accomodation

From the interview results, 60% of respondents stated that the conservation budget was sufficient but needed to be increased. 100% of respondents noted that protective equipment and facilities were adequate. 100% of respondents indicated monitoring and evaluation were carried out well and used in management. There are three assessments of accommodation in Lubuk Larangan, Bandur Picak Village: budget, equipment and activities, and monitoring and evaluation. Details can be seen in Table 7.

Table 7. Assessment of Accommodation in Lubuk Larangan

Issue	Criteria	Percentage (%)	Score Value
0. Cost Budget	0. No Budget	100	-
	1. Insufficient budget	-	-
	2. Sufficient but necessary Improved	-	-
	3. Sufficient budget and Fulfil	-	-
2. Equipment and Facilities	0. Little or none equipment and facilities to meet needs management	-	-
	1. Partially inadequate great management needs	-	-
	2. There are still shortcomings hinder management	-	-
	3. Equipment and facilities existing ones are sufficient	100	15
3. Monitoring and Evaluation	0. No monitoring or evaluation in conservation areas	-	-
	1. There are monitoring activities but there is no strategy	-	-
	2. Agreed and implemented but the result is no bait come back	-	-
	3. There are monitoring activities which was implemented well and used in management	100	15
TOTAL			30

4. Conclusions

In this research, it is necessary to improve the legal status of Lubuk Larangan at the fisheries service level and not just at the village level. The budget for managing the Lubuk Larangan Village of Bandur Picak Village must also be increased again so that management runs well and produces more results than the previous year. It is best for areas that do not yet have a Lubuk Larangan Village to follow the example of the Lubuk Larangan Bandur Picak Village, which helps conserve resources for fish.

5. References

- Dani, A.P., Nugroho, F., & Amrifo, V. (2016). Local Wisdom of Lubuk Prohibition as Conservation of Aquatic Resources in Nagari Sicukur District V Koto Kampung in Padang Pariaman Regency, West Sumatra Province. *Berkala Ilmiah Perikanan Terubuk*, 42.
- Henri, H., Hakim, L., & Batoro, J. (2018). Local Community Wisdom as an Effort to Conservation the Pelalawan Forest in Central Bangka Regency, Bangka Belitung. *Jurnal Ilmu Lingkungan*, 16(1).
- Mulyani, I., Sumiarsih, E., Putra, R. M., Shahrian, W., & Ariyani, D. (2022). The Ecological Analysis of the Habitat of Semahfish (*Tor tambroides*, Bleeker 1854) in the Kampar Kanan Hulu River Koto Kampar Hulu District, Kapar Regency, Riau Province. *IOP Conference Series: Earth and Environmental Science*, 1118(1): 012044).
- Putri, S.F. (2016). Fishing Culture in Lubuk Larangan (Study of Local Wisdom in Community of Pangkalan Indarung Village, Singingi District, Kuantan Singingi Regency). *JOM Fisip Journal*, 3(1).
- Yunus, M. (2020). Managing Prohibition Holes in the Kampar River. *Social and Cultural Journal*.