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Corporate Social Responsibility and Corporate Governance: a Bibliometric Analysis Study

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ABSTRACT

Domestic wastewater management has become a critical environmental and public health challenge globally, particularly in rapidly developing regions. The United Nations Sustainable Development Goals (SDGs), specifically Goal 6, emphasize the importance of ensuring availability and sustainable management of water and sanitation for all. According to the WHO/UNICEF Joint Monitoring Programme (2021), approximately 2 billion people worldwide lack safely managed sanitation services, leading to widespread water pollution and waterborne diseases. The aim of this study is to evaluate the domestic wastewater management system currently implemented in Banjar Regency. River water quality was analyzed using the STORET method by comparing sampling results with applicable water quality standards, while data on sanitation access were obtained from the Banjar Regency Government. SWOT analysis was used to assess the current state of domestic wastewater management in the region. The results of the STORET analysis indicate that water quality in the Martapura Sub-watershed has improved due to government programs related to domestic wastewater treatment and management. Data on access to domestic wastewater facilities show that most residents have independently owned toilets, supported by government programs that assist low-income communities in gaining access to domestic sanitation facilities. The SWOT analysis highlights the need for improved management practices among the Beneficiary and User Groups (KPP), who serve as operators in each village.

KEYWORDS *Domestic Wastewater, STORET Method*

INTRODUCTION

Global water pollution from domestic wastewater represents one of the most pressing environmental challenges of the 21st century (Smith & Johnson, 2019). The World Health Organization (WHO) reports that contaminated water is linked to the transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio, affecting millions of people annually (WHO, 2022). The United Nations estimates that 80% of wastewater flowing back into the ecosystem is untreated, causing significant environmental degradation and public health risks (UN-Water, 2017). In developing countries, particularly in Southeast Asia, rapid urbanization and population growth have intensified the discharge of untreated domestic wastewater into water bodies, severely compromising water quality and ecosystem health (Asian Development Bank, 2020; Nguyen & Le, 2021). Recent studies also show that the lack of adequate wastewater treatment infrastructure exacerbates these problems, making it a key factor in the decline of aquatic ecosystems (Kumar et al., 2021). Furthermore, the discharge of untreated wastewater into rivers and lakes has long-term consequences on biodiversity and local economies (Nguyen et al., 2023).

Domestic wastewater, defined as wastewater originating from residential activities, restaurants, offices, and other non-industrial sources, contains a complex mixture of organic and inorganic compounds, pathogens, nutrients, and chemical contaminants (Nguyen & Tran, 2021). When discharged untreated into rivers and streams, these pollutants degrade water

quality, reduce dissolved oxygen levels, promote eutrophication, and pose serious health risks to communities dependent on these water sources for drinking, bathing, and irrigation (Ali et al., 2019). The pollution of freshwater resources not only threatens human health but also disrupts aquatic ecosystems, diminishes biodiversity, and undermines the sustainability of water resources for future generations (Zhao & Li, 2020; Zeng & Hu, 2021). Such environmental degradation leads to long-term consequences for both public health and the economy, particularly in developing countries where access to clean water is limited (Miller et al., 2022). Furthermore, untreated wastewater discharge exacerbates the challenges faced by cities and communities already struggling with urbanization and inadequate sanitation infrastructure (Liu & Zhang, 2023).

In Indonesia, domestic wastewater pollution has reached critical levels. The Indonesian Ministry of Environment reported in 2014 that 60-70% of rivers across the country are polluted primarily by domestic or household waste (Ministry of Environment, 2014). This alarming statistic reflects inadequate wastewater treatment infrastructure, limited public awareness about sanitation practices, and insufficient enforcement of environmental regulations (Kumar et al., 2024; Mensah et al., 2023; Valera et al., 2024). The impacts of untreated domestic wastewater are multifaceted: elevated levels of Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) indicate high organic pollution that depletes oxygen necessary for aquatic life; increased turbidity from Total Suspended Solids (TSS) affects photosynthesis in aquatic plants; and the presence of fecal coliforms signals pathogenic contamination that can cause waterborne diseases such as diarrhea, cholera, typhoid, and hepatitis (Rahayu et al., 2017; Effendi, 2016).

Rapid population growth, especially in Banjar Regency, can affect the environment and its surroundings. The number of population activities will also affect the type of waste produced. One of them is domestic wastewater that comes from household activities. Based on the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 04/PRT/M/2017 it is explained that domestic wastewater is wastewater that comes from businesses and/or residential activities, restaurants, offices, businesses, apartments, and dormitories.

Generally, domestic wastewater contains substances that can harm human health and interfere with the aesthetics of the environment. Waters that have a high content of organic and inorganic matter are sourced from human activities in the form of discharging wastewater into rivers such as bathing, washing, and toilets (MCK), this causes a decline in water quality (Tarigan, 2013). The impacts caused by domestic wastewater pollution include diarrhea and kholera diseases (Lumunon, 2021).

According to data from the Central Statistics Agency of Banjar Regency, the total population of Banjar Regency in 2024 is 584,690 people with a growth rate of 1.39%, and the population density is around 120 per Km2 (BPS Banjar Regency, 2024). The achievement of decent sanitation access in Banjar Regency is 84.95%, or around 499,183 residents, while people who do not have access to sanitation are 15.05% or around 75,932 residents. Based on data on river water quality monitoring carried out by the Banjar Regency People's Settlements, Settlement Areas and Environment Office, which is located in the Martapura River Sub-watershed with five monitoring points in 2022-2024, the acidity degree in the river is on average 6.76-8.61, the average BOD (Biochemical Oxygen Demand) value is 1.49-7.75, the

average COD (Chemical Oxygen Demand) value is 6.95-25.85, TSS (Total Suspended Solids) is between 12.5-93, DO (Dissolved Oxygen/Oxygen Demand) averaged at 3.60-5.48, NO3-N (Nitric Nitrogen) averaged at 0.59-1.98, and Fecal Coli averaged at 34.50-4894.

Wastewater is the result of the remaining days of activities or businesses which are divided into two, namely domestic and non-domestic waste. Domestic wastewater is wastewater that comes from businesses and/or activities in settlements, restaurants, offices, businesses, appliances and dormitories. Domestic Wastewater is divided into two, namely toilets that come from septic tanks, and non-toilets that come from household activities (Bakkara, 2022)

Domestic wastewater is household waste water that is discharged into water bodies which can potentially be one of the sources of problems with raw water. Domestic wastewater is a considerable problem considering the emergence of population growth that is getting bigger and faster. The Indonesian Ministry of Environment in 2014 issued a study that 60-70% of rivers in Indonesia are polluted with domestic or household waste. Untreated domestic wastewater can cause a variety of problems for humans and the surrounding environment. In general, the characteristics of domestic wastewater include, the Domestic Wastewater Quality Standard (Minister of Environment and Forestry No. 69, 2016)

The impact caused by untreated wastewater includes high levels of organic compounds causing water to not be stored for more than 24 hours and when stored will cause an unpleasant odor. The quality of wastewater that contains soap will increase the alkalinity of the soil and kill plants. Poor water quality will be a source of disease and a place for bacterial development (Bakkara, 2022). Another consequence of Domestic Wastewater Disposal will directly experience siltation and a decrease in water quality if it receives the burden of pollutants and exceeds the river's ability to repair and clean itself (Kalembiro, 2024).

The Domestic Wastewater Management System (SPALD) is a series of domestic wastewater management activities in one unit with domestic wastewater management infrastructure and facilities. Then wastewater and fecal sludge are treated either directly or transported to the Fecal Sludge Treatment Plant (IPLT). The measure of the quality of domestic wastewater treatment provision has several parameters:

a. Safe Access Service is the provision of individual defecation facilities for communities with a minimum population density of 25 (twenty-five) people per herctar and/or in all urban areas where the upper building is equipped with a gooseneck toilet and the lower building is equipped with:
    1) The septic tank is in accordance with the standard with fecal sludge vacuumed periodically, at least once every three years, and discharged and treated to IPLT; or
    2) A home connection connected by a piping system to a Centralized Domestic Wastewater Management System (SPALD-T).
b. Proper access services are defecation facilities for people living in rural areas with a population density of less than 25 (twenty-five) people per hectare where the upper building is equipped with gooseneck toilets and banwah buildings using earthen holes or twin cubluks.

People in Banjar Regency, especially those located on the banks of the Martapura Sub-Watershed, carry out activities that produce domestic waste that is directly disposed of into the river body, both processed domestic waste and not. This habit has become a culture that

continues to be passed down from generation to generation and has become a habit for the residents of Banjar Regency who live on the banks of the Martapura Sub-Watershed. The reasons for the community are diverse, ranging from frequent activities on the riverbanks, not having access to sanitation, and not having the cost to make access to Safe Sanitation that meets SNI standards. The conditions of access to sanitation in Khsusnyai Regency in the Martapura Sub-Watershed are in the form of private toilets with SNI Standard Septic Tanks, private toilets with cubluk holes, private toilets without treatment (direct discharge into the river body, excavation of soil holes, etc.), public toilets with non-impermeable tanks, to latrines (floating toilets).

Based on data from the Public Works, Spatial Planning, and Land Office of Banjar Regency, Banjar Regency has built Individual Septic Tanks for the underprivileged community in a total of 7781 units until 2024 as seen in Figure II.11 The construction carried out by the Public Works Office of Spatial Planning and Land of Banjar Regency. A total of 122,555 households already have access to proper sanitation. Then from all the domestic waste, it is transported by the Regional Service Agency (BLUD) Intan Banjar to be suction and transported to the Domestic Wastewater Access located in Karang Intan, the suction system still uses On Calling from each sanitation access owner. The Banjar Regency Government itself has dismantled latrines from 2017 to 2024 with a total of 1,451 floating latrines.

Banjar Regency, especially the PUPRP Office, has made innovations to carry out cheap suction based on BUMDES, namely GEBRAKS MANIS or the Independent and Religious Advanced Sanitation Sustainability Movement. Namely by placing several temporary collection stations at strategic points so that the community can carry out suction through a mobile fecal motor (MOTENG) and collected at the Saptige Trans Station (STS) seen in Figure II.12, with the hope that the community can carry out LLTT activities properly and also carry out maintenance, and can reduce large operational costs.

Despite these government interventions, significant gaps remain in understanding the effectiveness of current domestic wastewater management systems, the actual water quality status of the Martapura Sub-watershed, socio-economic barriers to sanitation adoption, community participation levels, and institutional capacity for sustainable management. Previous research has explored various dimensions of this complex issue, providing important insights that inform the present study.

Several studies have demonstrated the effectiveness of the STORET (Storage and Retrieval) method in assessing water quality status across different geographical contexts. Romdania et al. (2018) conducted a comparative study evaluating the application of three water quality indexing methods—Pollution Index (IP), STORET, and Canadian Council of Ministers of the Environment Water Quality Index (CCME WQI)—for determining water quality status in Indonesian rivers. Their findings indicated that while all three methods can effectively identify pollution levels, the STORET method offers particular advantages in its comprehensive scoring system that accounts for the frequency, magnitude, and persistence of water quality standard violations, making it especially suitable for regulatory compliance assessment in developing countries. Similarly, Poedjiastoeti (2017) applied the STORET method to evaluate surface water pollution in the lower Garang Sub-watershed in Central Java, Indonesia, demonstrating how this multi-index approach can reveal spatial and temporal pollution patterns that inform targeted intervention strategies.

Research on community participation in sanitation programs has revealed critical factors influencing program success and sustainability. Sasse (1998) and Singh et al. (2009) emphasized that community-based wastewater management systems, particularly Decentralized Wastewater Treatment Systems (DEWATS), achieve optimal performance when communities are actively involved from the planning stage through operation and maintenance. Their studies documented cases in Nepal and other developing countries where community ownership and participation directly correlated with system sustainability and effectiveness. These findings underscore the importance of understanding local socio-economic conditions, willingness to pay for services, and institutional capacity of community-based organizations in managing sanitation infrastructure.

SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis has proven valuable for strategic planning in wastewater management contexts. Rangkuti (2008) outlined comprehensive frameworks for applying SWOT analysis to various sectors, including environmental management, demonstrating how this tool facilitates identification of internal organizational capabilities and external environmental factors that influence program outcomes. In the water and sanitation sector specifically, SWOT analysis enables stakeholders to develop context-appropriate strategies that leverage existing strengths, address critical weaknesses, capitalize on emerging opportunities, and mitigate potential threats.

Research examining socio-economic factors affecting sanitation behavior and willingness to pay has identified income levels, education, awareness of health risks, and cultural practices as key determinants. Studies in similar Indonesian contexts have shown that even when sanitation infrastructure is available, low-income households may struggle to afford connection fees and monthly service charges, while lack of awareness about health benefits can reduce motivation to adopt improved sanitation practices (Ministry of Public Works and Public Housing, 2016). Understanding these socio-economic dynamics is essential for designing affordable, culturally acceptable, and sustainable sanitation interventions.

Despite this body of knowledge, significant research gaps remain. First, limited studies have applied integrated methodological approaches combining water quality assessment (STORET), socio-economic analysis, community participation evaluation, and institutional capacity assessment (SWOT) within a single comprehensive investigation. Second, context-specific research on the Martapura Sub-watershed in Banjar Regency is lacking, particularly studies that examine the effectiveness of recent government programs such as the GEBRAKS MANIS initiative and the impact of Individual Septic Tank construction programs on river water quality. Third, there is insufficient understanding of how community-based Beneficiary and User Groups (KPP) function as sanitation service operators and what institutional strengthening strategies could enhance their performance.

The urgency of this research is underscored by several factors. First, the Martapura River continues to face increasing pollution pressure as population growth accelerates in Banjar Regency, threatening water security for current and future generations. Second, despite substantial government investment in sanitation infrastructure—7,781 Individual Septic Tanks constructed and 1,451 floating latrines dismantled—systematic evaluation of these interventions' impacts on water quality has been limited. Third, achieving universal sanitation coverage and improved water quality requires evidence-based policy recommendations grounded in comprehensive understanding of technical, socio-economic, participatory, and

institutional dimensions. Fourth, Indonesia's commitment to Sustainable Development Goal 6 (Clean Water and Sanitation) necessitates rigorous monitoring and evaluation of domestic wastewater management systems at the regional level.

The novelty of this research lies in its integrative approach that combines multiple analytical methods to provide a holistic assessment of domestic wastewater management in the Martapura Sub-watershed. Specifically, this study uniquely contributes to the literature by: (1) applying the STORET method to evaluate temporal changes in river water quality across five monitoring points over a three-year period (2022-2024), enabling assessment of government intervention effectiveness; (2) conducting comprehensive socio-economic profiling of communities at each monitoring point, including detailed analysis of household expenditure patterns, occupational structures, and willingness to pay for sanitation services; (3) evaluating community participation levels through focus group discussions and household surveys that capture behavioral patterns, knowledge levels, and attitudes toward sanitation; (4) performing SWOT analysis of community-based Beneficiary and User Groups (KPP) to identify strategic directions for institutional strengthening; and (5) synthesizing findings across these multiple dimensions to develop integrated recommendations for sustainable domestic wastewater management that are both technically sound and socially feasible.

Therefore, this study aims to comprehensively evaluate the domestic wastewater management system in Banjar Regency, with specific objectives to: (1) assess the current water quality status of the Martapura Sub-watershed using the STORET method and identify spatial and temporal pollution patterns; (2) analyze the effectiveness of government programs in improving sanitation access and water quality; (3) examine socio-economic factors influencing community adoption of improved sanitation practices and willingness to contribute to operation and maintenance costs; (4) evaluate levels of community participation in domestic wastewater management activities; (5) assess the institutional capacity of Beneficiary and User Groups (KPP) through SWOT analysis; and (6) formulate strategic recommendations for strengthening domestic wastewater management systems in the region.

The benefits and implications of this research are multifaceted. For policymakers and government agencies, this study provides evidence-based insights to refine domestic wastewater management policies, optimize resource allocation, and design more effective community-based sanitation programs. For Beneficiary and User Groups (KPP) and local communities, the findings offer practical guidance for improving operational management, enhancing community participation, and ensuring long-term sustainability of sanitation infrastructure. For researchers and academics, this study contributes methodological insights on integrated approaches to sanitation assessment and expands the empirical evidence base on domestic wastewater management in Indonesian riverine contexts. Ultimately, this research supports Banjar Regency's efforts to achieve universal sanitation coverage, protect water resources, improve public health outcomes, and advance progress toward Sustainable Development Goal 6.

METHOD

This study employed a mixed-methods approach that combined quantitative water quality assessment, socio-economic surveys, and qualitative institutional analysis to comprehensively evaluate the domestic wastewater management system in Banjar Regency.

Preparation and data collection constituted the first steps in completing this scientific case study. These preparations were based on literature studies related to the problems addressed, as well as the collection of primary and secondary data. The research was conducted in five villages along the Martapura Sub-watershed: Tambak Anyar Ulu, Pekauman Ulu, Sungai Rangas Tengah, Sungai Batang Ilir, and Sungai Pinang Lama. These locations were strategically selected as water quality monitoring points by the Banjar Regency Public Works Office, representing upstream-to-downstream conditions of the sub-watershed.

The data collection process involved several key considerations, including the type of data collected, the locations of collection, and the volume of data gathered. The preparation stage included a comprehensive literature review of books, peer-reviewed journals, government regulations, and technical reports on domestic wastewater management, water quality assessment methods, community-based sanitation systems, and institutional development frameworks. This review established the theoretical foundation and identified appropriate analytical methods for the study.

Data triangulation was employed to enhance validity by comparing findings across multiple data sources (water quality monitoring, household surveys, focus group discussions [*FGDs*]) and methods (quantitative measurement, statistical analysis, qualitative thematic analysis). Ethical considerations included obtaining informed consent from all *FGD* participants and household interview respondents, ensuring confidentiality of personal information, and securing necessary permissions from village authorities and relevant government agencies.

RESULT AND DISCUSSION

Based on the observation results, in the Martapura Sub-Watershed there are 5 monitoring points, namely Tambak Anyar Ulu, Pekauman Ulu, Sungai Rangas Tengah, Sungai Batang Ilir, and Sungai Pinang Lama with a description of sanitation access in each village in Table 1.

Table 1. Sanitation Access at Monitoring Points in the Martapura Sub-Watershed until 2024 (Banjar Regency Spatial and Land Planning Public Works Office, 2024)

District	Village	Number of Heads of Families	Eligible Access (Cubluk, etc.) (KK)	Secure Access (CD)	*Sh Squirt* (CD)	No Access (CD)
East Martapura	Tambak Baru Ulu	743	587	151	0	5
East Martapura	Pekauman Ulu	722	518	52	95	57
West Martapura	Batang Ilir River	632	239	151	200	42
West Martapura	Central Rangas River	319	232	0	61	26
Sungai Tabuk	Sungai Pinang Lama	800	234	103	10	453

Based on this data, the Domestic Wastewater Management System used by residents is an individual system, both cubluk and SNI septic tanks. Individual septic tanks are built using wooden walls coated with cast cement, or using manufactured septic tanks that are then framed and coated with cast as the septic tank cover. The analysis in the technical aspect is divided into two, namely the quality of the river at the monitoring point, and the physical condition of sanitation access.

Monitoring was carried out at five village monitoring points, namely Tambak Anyar Ulu village (TP-1), Pekauman Ulu Village (TP-2), Sungai Rangas Tengah Village (TP-3), Batang Ilir River (TP-4), and Sungai Pinang Lama (TP-5). Sampling was carried out by the Public Housing Office for Settlement and Environment. Sampling is carried out at a point that is believed to be a daily source of water by the community which is then taken to the laboratory to find out the value of river raw water at each Monitoring Point.

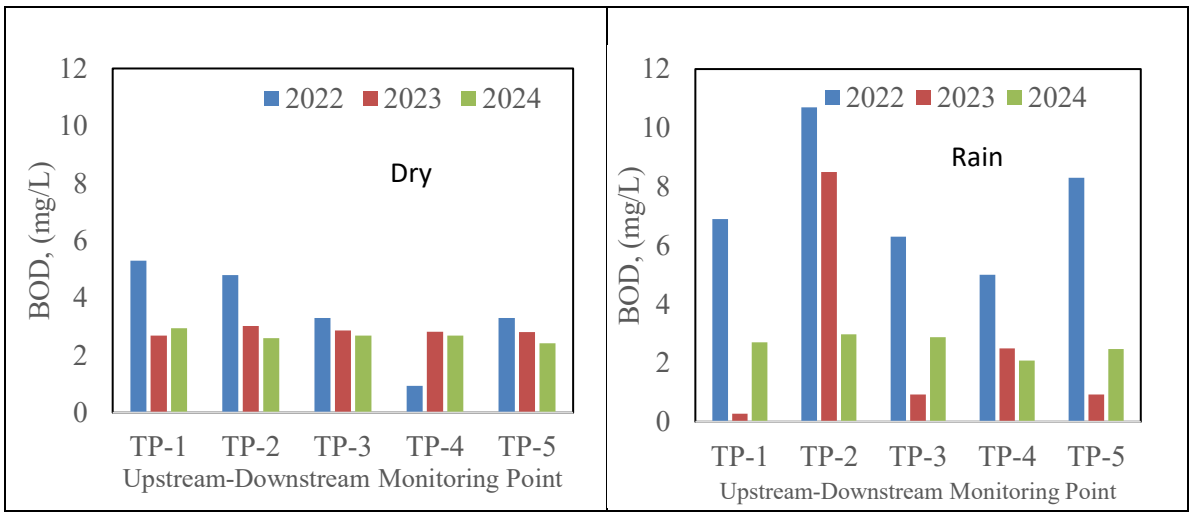

Figure 1. The value of the Martapura Subwatershed BOD from Upstream to Downstream in 2022, 2023 and 2024

In Figure 1, the BOD value shows that there was a fluctuating data difference in 2022. This shows that the difference in handling in each village will affect the quality of raw water in the Martapura Sub-Watershed. The value of BOD tends to decrease every year judging from the 2023-2024 data. This shows the improvement of raw water quality where every monitoring point has begun to be reached by the Banjar Regency government program. Differences in seasons also affect the quality standard value.

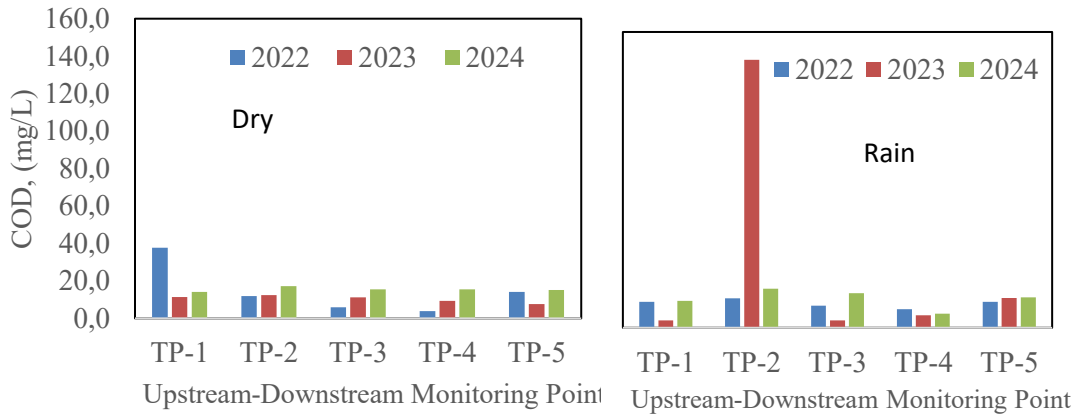

Figure 2. The COD value of the Martapura Sub Watershed from Upstream to Downstream in 2022, 2023 and 2024

There are abnormal values in TP-2 where there is a possibility of errors in the sampling method in river raw water, while other quality book values look normal and tend to experience a decrease in COD values. The government program is running well at each monitoring point with a decrease in the COD value in raw water at the monitoring point. In the dry season, the water in the river is more smelly than the river water during the rainy season

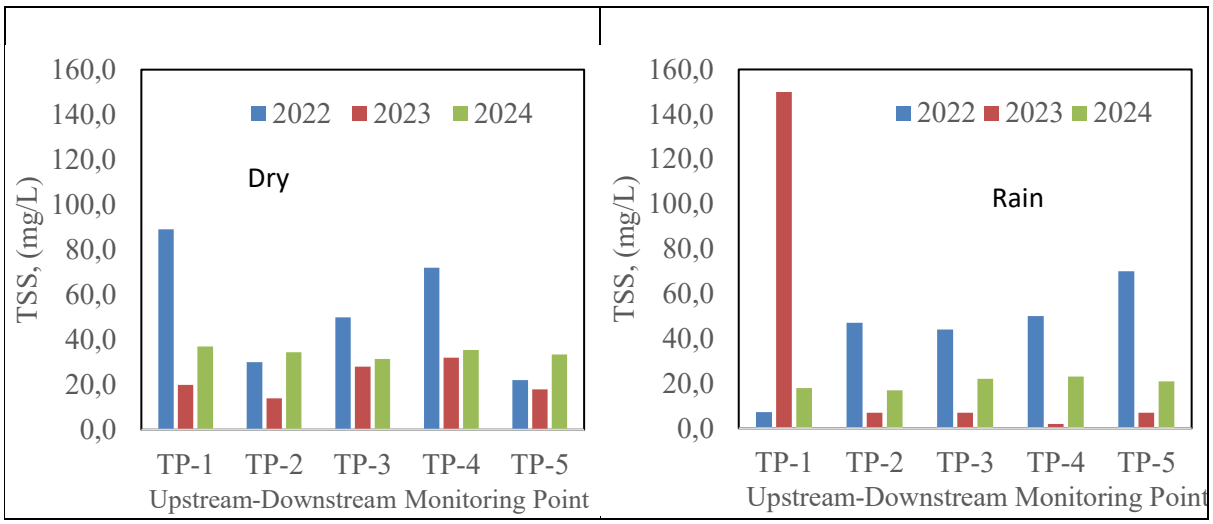

Figure 3. TSS Value of the Martapura Sub Watershed from Upstream to Downstream in 2022, 2023 and 2024

The value in TP-1 in 2023 is the only high value, the cause of this high value is influenced by errors or contamination when bringing samples to the laboratory, TSS values in the dry season tend to decrease every year, the cause of the decline in TSS is that the water discharge flowing from the upstream decreases, so that mud sand particles can settle on the riverbed. Water also tends to be cloudier and darker in color during the dry season. Meanwhile, in the rainy season, the river discharge increases so that the water carried from upstream to downstream increases drastically, this is also shown by the dominance of TSS data that continues to increase at the Monitoring Point downstream.

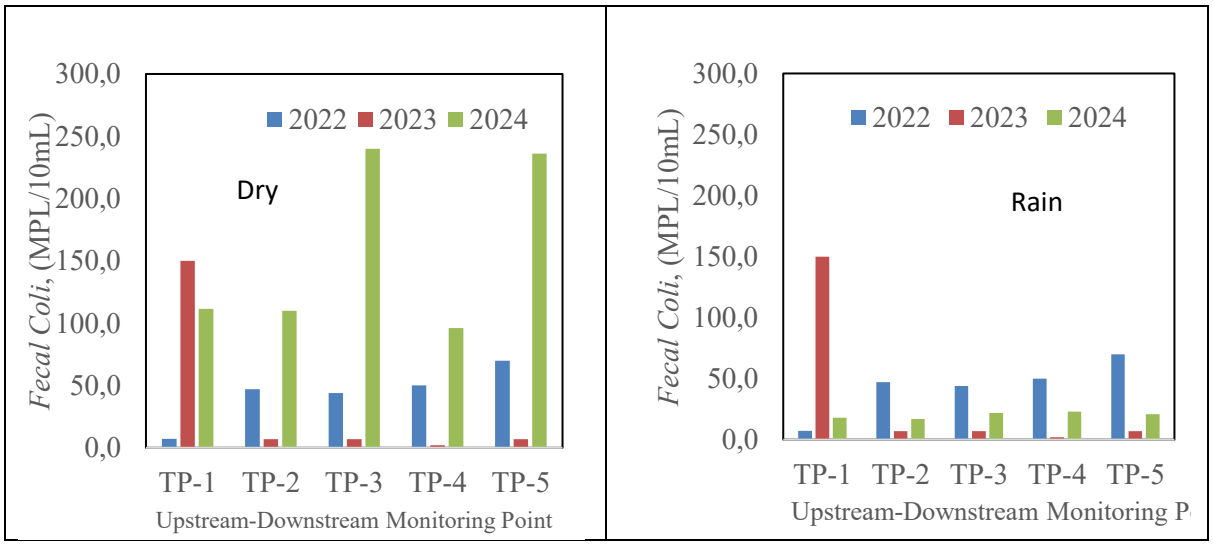

Figure 4. Fecal Coli Value of Martapura Watershed from Upstream to Downstream in 2022, 2023 and 2024

In contrast to other quality standards, Fecal Coli shows that in the rainy season, Fecal Coli dissolved in river water tends to be small due to large discharge and continues to increase at each Monitoring Point due to accumulation at certain points. During the dry season, Fecal Coli increases drastically at the downstream point due to the small discharge that enters from upstream to downstream. River water that is often used by the average community is contaminated by Fecal Coli which can cause the spread of diarrhea and vomiting diseases

Wastewater influenza quantity analysis was carried out to determine the burden of the river on polluters, especially domestic wastewater. The results of the study showed that the quality of river water at each location monitoring point was still below the criteria. This will certainly affect the quality of river water that will be used as a daily source of clean water.

The results of the analysis at the monitoring point with sampling carried out by the Public Housing, Settlement Areas, and Environment Office obtained the following results: Domestic Wastewater that enters the river body contains a variety of pollutants that are not limited to the parameters listed in Government Regulation Number 22 of 2021 concerning the Implementation of Environmental Management Protection. The condition of the Martapura Sub-Watershed recorded that it experienced pollution at the class II quality standard in the Banjar Regency area. The magnitude of the Pollutant load of each parameter can be seen in the following table.

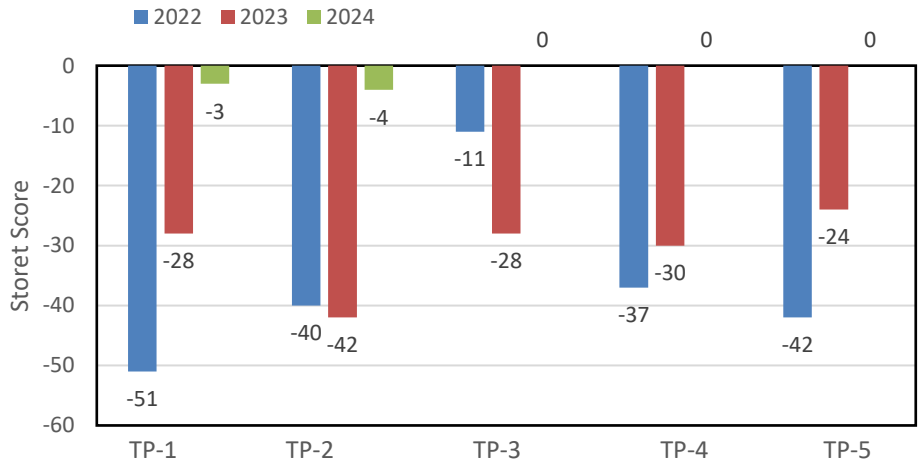

Figure 5. Storet Results of Martapura Watershed Sub Storet

Based on the results of the Storet calculation in Figure 5, the river water in the Martapura Sub-Watershed in Sungai Rangas Tengah Village, Batang Ilir River and Sungai Pinang Lama has improved water quality to meet the quality of class II quality standards for rivers. Meanwhile, Tambak Anyar Ulu and Pekauman Ulu Villages have not met quality standards with lightly polluted status.

1. Analysis of Socio-Economic Aspects

The socio-economic conditions of the population in each region are different. This will be closely related to the community's ability to pay fees for the operation of Domestic Wastewater Access and its network. Based on the results of interviews with the user community at the time of the FGD, the amount of expenditure can be seen in Figure IV.6.

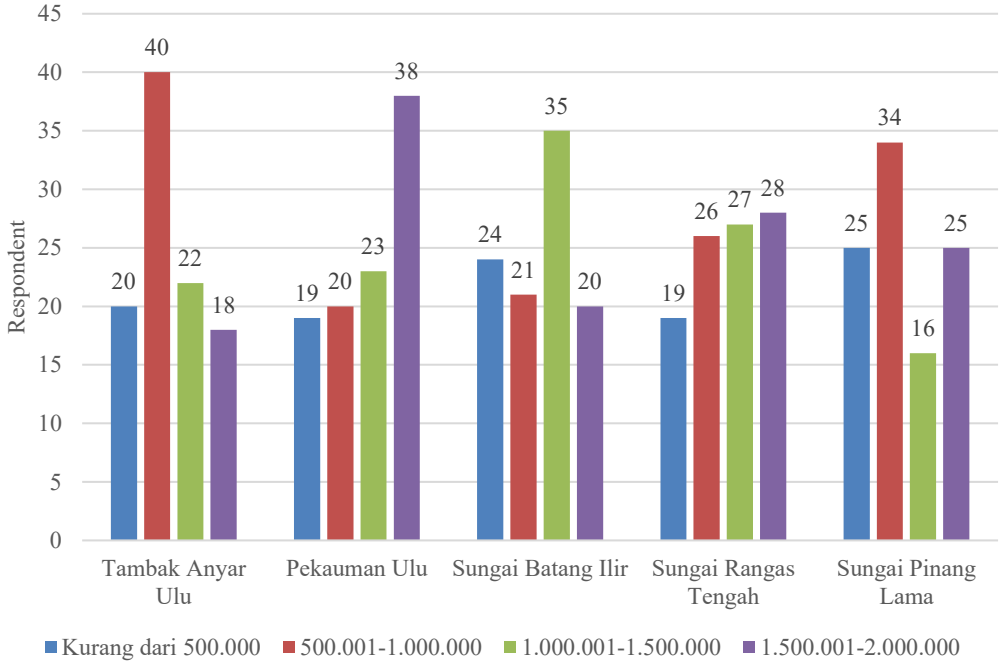

Figure 6. Monthly Expenditure of Each Household at Each Monitoring Point

The economic ability of the people who use Domestic Wastewater Access can be seen from the amount of costs that must be incurred to meet household needs every month Monthly expenses are grouped into 4 categories with a range of expenses below Rp.500,000,- to Rp.2,000,000,-. From the results of the questionnaire filled out by the FGD participants, it can be seen that the average respondent spends more than Rp.1,500,000,- so that the contribution of Rp.5000,- which was planned at the time of the preparation of the RKM is still considered burdensome. With an income below Rp. 2,500,000,- the user community is categorized as a low-income community.

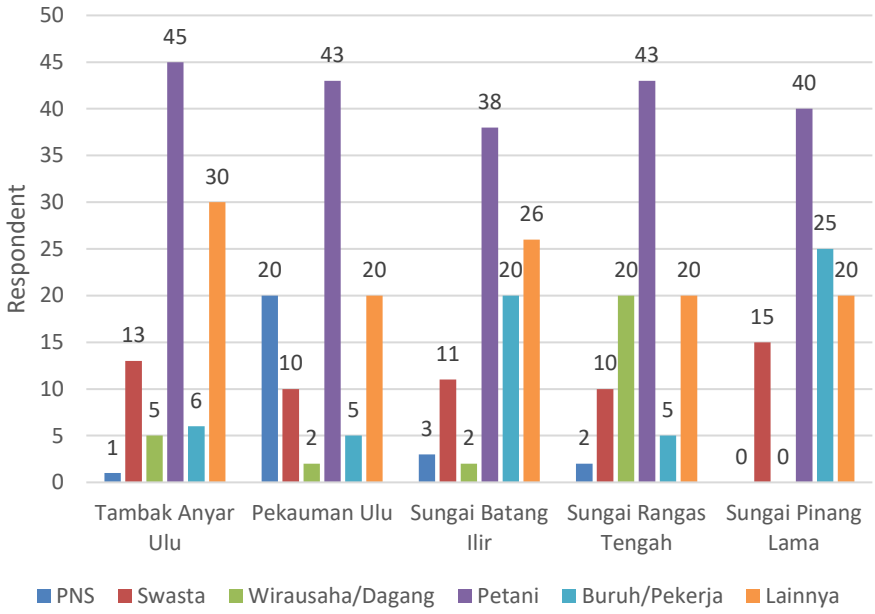

Figure 7. The Work of the Head of the Family

Based on the dominance of the work of the head of the family at each monitoring point is farmers, this shows that the source of Domestic Wastewater is purely from the results of daily activities and not from other business activities. Laborers/craftsmen are also dominating in two villages, namely Sungai Batang Ilir and Sungai Pinang Lama with income that is still in the form of daily wages. Meanwhile, according to the information from the interview results, the head of the family usually works as a taxi driver, street sweeper, market coolie, tailor, etc. The income from the work is also still low, ranging from Ten Thousand to Thirty Thousand Rupiah per day.

The community's contribution to the management of Domestic Wastewater is contributions. The payment mechanism for contributions varies from location to location. The amount of contributions has been determined at the time of the preparation of the Community Work Plan (RKM) by means of deliberation. But the obstacle that exists when operations are running is the ability and willingness of the community to pay. The community's background in terms of economic ability determines their ability to pay contributions when the operation of Domestic Wastewater Access has been running. Based on the results of the questionnaire at the FGD, it is known that it can be known the willingness of the community's ability to participate in the form of contributions as seen in Figure IV.8.

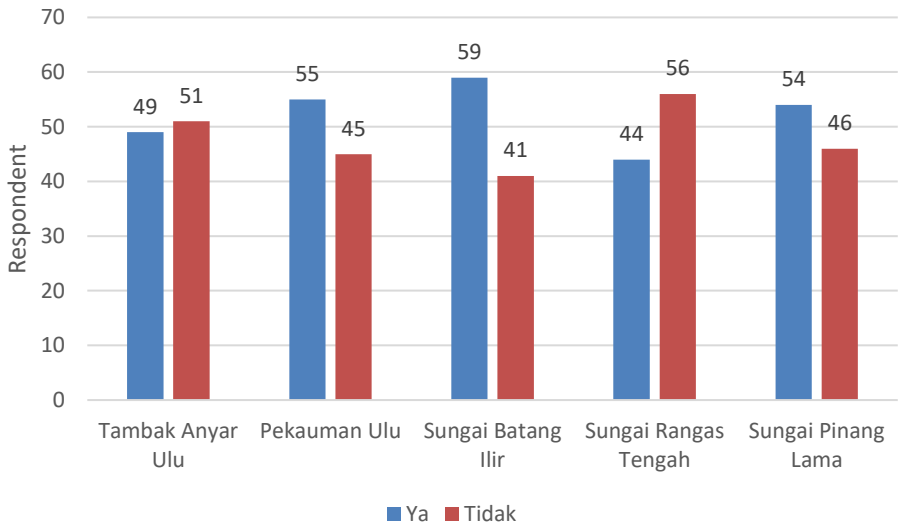

Figure 8. Community's Ability to Pay Contributions

Based on Figure 8 at the location of Tambak Anyar Ulu Village, 49% are willing to pay contributions and 51% are unwilling to pay. Pekauman Ulu Village is clearly the enthusiasm of the community to pay more, which is 55%, and for those who do not want to pay, it is around 45%. Sungai Batang Ilir Village experienced different conditions where people who did not want to pay were 41%, and people who were willing to pay were around 59%. The Central Rangas River experiences obstacles related to contributions, as many as 56% of the community does not want to pay for domestic wastewater operations and only 44% of the community is willing to pay contributions. Then for Sungai Pinang Lama Village, 54% of people are willing to pay contributions for Domestic Wastewater operations, while 46% of people still do not want to pay it for various reasons ranging from the high price of contributions to not holding money at the time of contribution collection. Various conditions that occur in various villages make cash and operational costs still use the APBDes and voluntary money from the community.

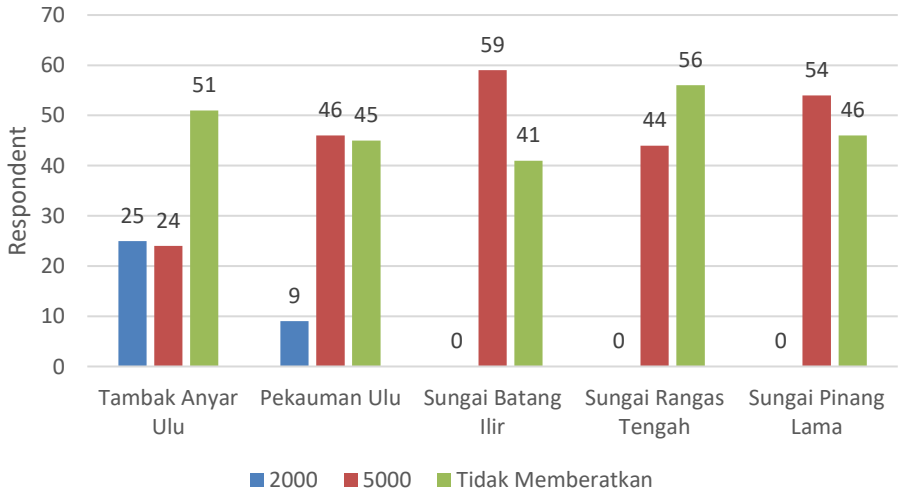

Figure 9. The amount of contributions desired by the community

Based on figure 9, there are two villages that suggest to carry out a contribution of 2000 rupiah, namely in Tambak Anyar Ulu Village as many as 25 people and Pekauman Ulu Village as many as 9 people. The difference in payment will have an impact on operations and maintenance, and there will be social jealousy if the difference in contribution bills is applied.

2. Analysis of Community Participation Aspects

Community participation is related to the willingness of the community to be actively involved in the management of domestic wastewater in settlements. This participation should have started from the initial stage of development, so that the community can understand their rights and obligations before sanitation facilities and infrastructure are built. The community's right in settlement-scale sanitation services is to get sanitation services according to the agreement. Meanwhile, the obligation is to contribute thoughts, time, and finances both for construction and maintenance operations through the payment of monthly routine contributions. (Ministry of Public Works and Public Housing, Director General of Cipta Karya, 2016). Clean and Healthy Living Behavior (PHBS) from the community is very helpful for the Regional Government to set targets to improve sanitation programs. The community can be actively involved and take part in maintaining it if they have knowledge and willingness and feel the positive impact of the development.

Based on the results of the questionnaire at the FGD, it is known that public knowledge about the responsibility and active role of the environment is still very minimal and depends on government programs. Almost in every location, the village holds an environmental cleanup program every week. This is to anticipate disruptions that arise to Domestic Wastewater Access and its network.

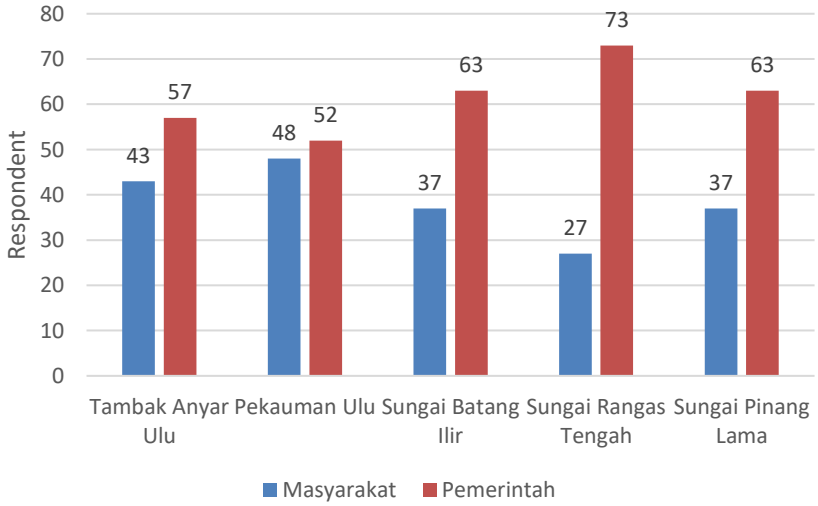

Figure 10. Environmental Responsibility

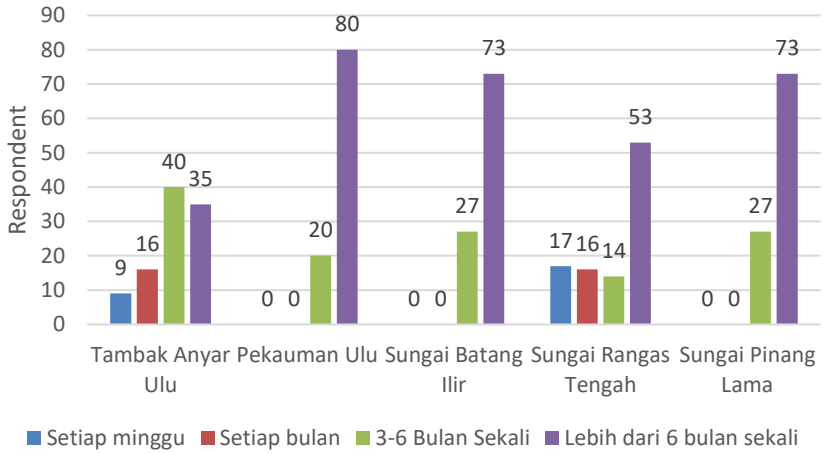

Figure 11. Domestic Wastewater Access Monitoring Activities

Figure 11 shows the frequent disruptions to Sanitation Access used by residents. The majority of residents have no complaints, but not a few in each village have odor problems, namely in Tambak Anyar Ulu Village by 19%, Pekauman Ulu by 30%, Batang Ilir River by 26%, Central Rangas River by 26%, and Sungai Pinang Lama by 51%. As for other obstacles according to the results of the questionnaire, there are also problems such as clogging or broken pipes that cause leaks around the environment adjacent to the domestic wastewater source.

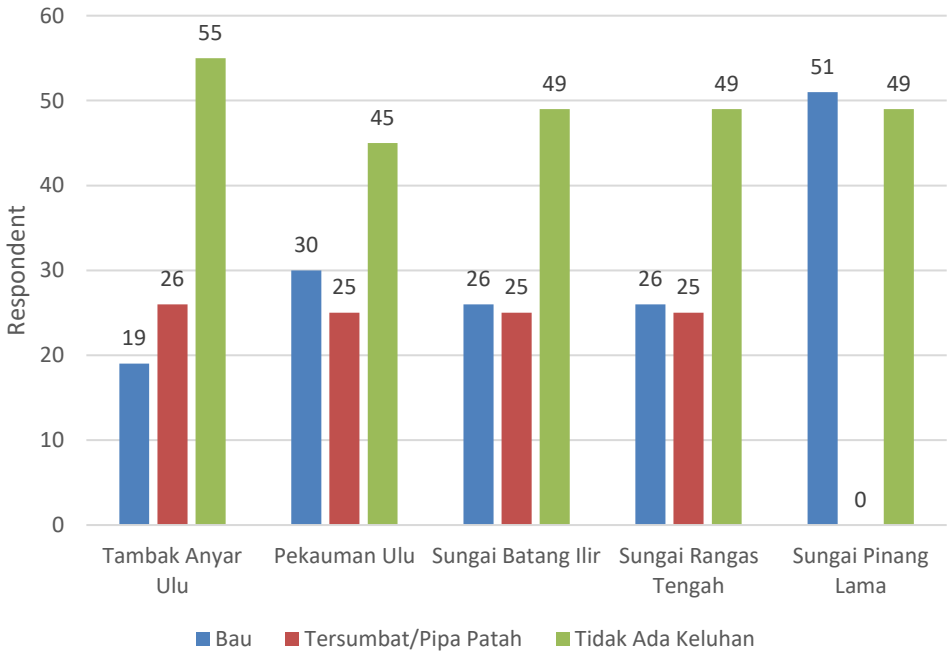

Figure 12. Disturbances occurring in Domestic Wastewater Access

There were various answers from the community when asked about the willingness of the community to pay contributions in the event of an obstacle. This is related to the socio-economic conditions of the community. The community plays more of a role in energy and not

money. In the picture, it can be seen that the majority of people are not willing to pay more to make repairs.

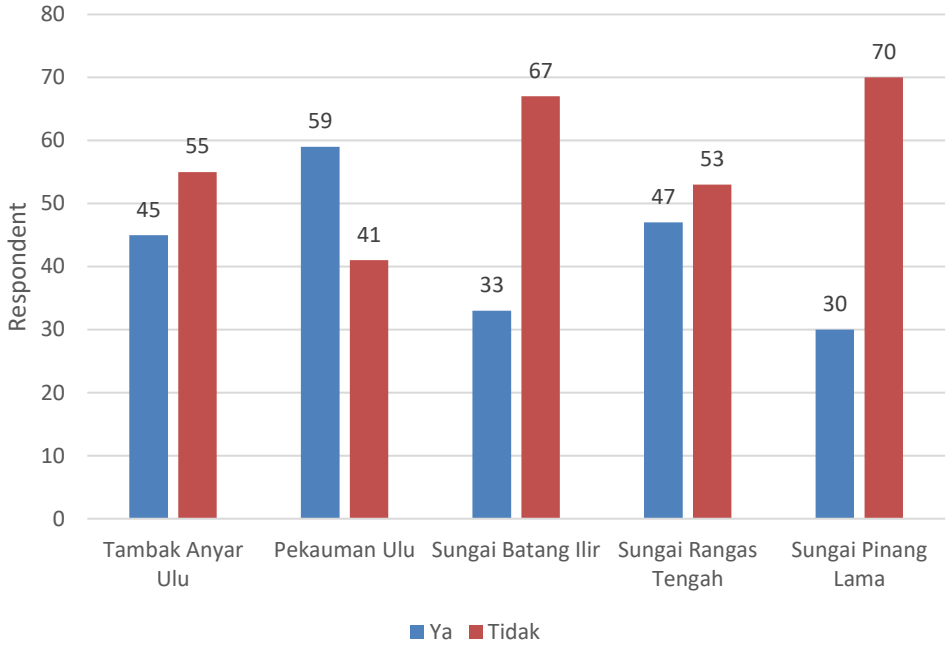

Figure 13. Community Willingness to Pay Related to Improving Domestic Wastewater Access

3. Institutional Aspect Analysis

Organizational structure plays an important role in the continuity and efforts to optimize the implementation of organizational sustainability. Based on the RKM Book that was prepared, in all Monitoring Point Locations, there is already an organizational structure formed by the community except for Sungai Rangas Tengah Village. Because the village has not been touched by programs related to Domestic Wastewater Management. This organizational structure adjusts to the conditions of each location and has met the basic requirements of management, namely the chairman, secretary, treasurer and section that coordinates contributions, operations and maintenance as well as health campaigns.

The Urgency value is determined by the Likert scale, i.e.: Very important = 5, Important = 4, Less important = 3, Not important = 2, Very unimportant = 1. The weight of the level of urgency of each factor will be percentaged, which then becomes the strong weight of the influence of each factor. Based on the calculations contained in the appendix, the internal factors of Strengths and Weaknesses are -0.1 and from the external factors of Opportunities and Threats are +0.35. The comparative value of internal and external factors will be the abscess values x and y (-0.1,+0.35). This condition is in quadrant III as shown in the following figure.

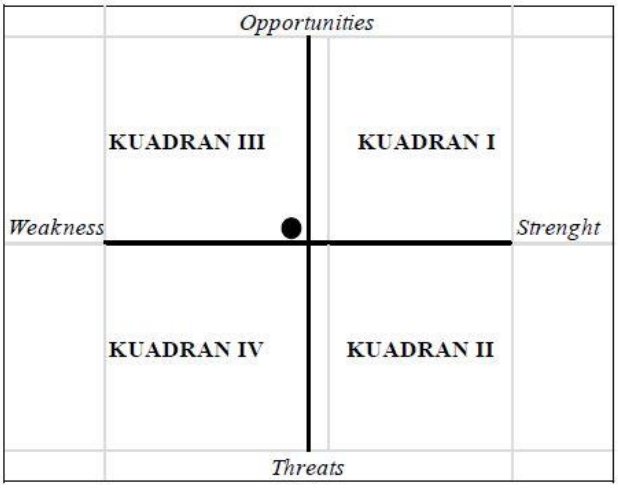

Figure 14. SWOT Diagram

The position in Quadrant III shows that KPP as a management institution has opportunities to develop. But there are still internal constraints/weaknesses. So the strategy that must be done is to minimize existing internal problems. Referring to the existing SWOT Diagram, then a strategy can be prepared by interacting with internal and external factors of positive value. SWOT Strategy Formulation.

Based on the results of the SWOT matrix, a Strategy was obtained from the aspects of Opportunities and Weaknesses for the institutional development of KPP as a manager of Domestic Wastewater Access. With considerable potential institutional conditions, KPP must be more active in coordinating with local governments in order to produce programs that can support the sustainability of Domestic Wastewater Access that has been built.

CONCLUSION

The analysis revealed that water quality in the Martapura Sub-watershed improved at three monitoring points—Rangas Tengah River, Batang Ilir, and Pinang Lama River—meeting Class II river standards per STORET calculations, while Tambak Anyar Ulu and Pekauman Ulu remained lightly polluted. Technically, most residents across the five points have domestic wastewater access, supplemented by SNI individual septic tank programs for those without, though gaps persist in Sungai Pinang Lama; overall, management requires further development to generate BUMDes income and local jobs. The SWOT matrix yielded strategies leveraging opportunities and addressing weaknesses to strengthen KPP institutions, urging greater coordination with local governments for sustainable wastewater access. For future research, longitudinal studies could track post-intervention water quality trends over 5+ years while evaluating KPP performance metrics and economic impacts on community livelihoods.

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