



SOCIO-ECOLOGICAL DILEMMA OF RIVERBANK COMMUNITIES: AN ANALYSIS OF WATER-SHARING CULTURE, SANITATION BEHAVIOR, AND ENVIRONMENTAL HEALTH RISKS IN BANJARMASIN CITY

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Abstract

The riverbank areas in Banjarmasin City represent a living space that is deeply intertwined with river culture as a community social identity. However, the high dependency on river resources to meet domestic needs has the potential to cause various sanitation and environmental health problems. This study aims to analyze the relationship between the dynamics of the social environment, sanitation practices based on local culture, and public health risks among residents living in the riverbank areas of Banjarmasin City. The study employs a mixed-methods approach with an explanatory design. Quantitative data were obtained through a survey of 250 heads of households residing in several riverbank areas with high environmental vulnerability, while qualitative data were gathered through in-depth interviews with community leaders and healthcare professionals, as well as field observations. The results show that a water-sharing culture and strong social interactions contribute to the formation of community social cohesion. However, the ongoing practice of using river water for bathing, washing, and toilet activities (MCK) amidst declining aquatic environmental quality correlates with a high incidence of environment-based diseases, particularly diarrhea, skin diseases, and gastrointestinal infections. Further analysis indicates that limited access to clean water infrastructure, low ownership of proper sanitation facilities, and low perception of health risks are the dominant factors influencing public sanitation behavior. These findings confirm that public health issues in riverbank areas are influenced not only by physical environmental factors but also by the social and cultural constructions that develop within community life. Therefore, efforts to improve environmental health need to be carried out through an integrated approach that combines the development of sanitation infrastructure, enhancement of health literacy, and the utilization of social capital and local wisdom of the river community to achieve sustainable environmental governance.

Keywords: Environmental Health, Local Culture, Riverbank Communities, Sanitation, Water-Sharing Culture.

INTRODUCTION

Riverbank settlements represent a form of human interaction with aquatic environments that has developed in various regions worldwide, particularly in urban areas with a long history of dependence on rivers as a source of livelihood. Rivers function not only as water sources and transportation routes but also shape the social, cultural, and economic identity of the communities living around them (Suhren et al., 2014). From a social-ecological systems perspective, environmental health and public health are two interconnected and inseparable aspects, as changes in environmental quality directly affect the well-being of communities dependent on these resources (Abramovsky et al., 2019). Numerous studies indicate that riverbank communities face higher risks of environmentally-borne diseases due to water pollution, limited sanitation, and poor access to basic infrastructure (Imron & Sudiyono, 2023).

Globally, the issue of sanitation in riverbank areas has become a critical concern in achieving the Sustainable Development Goals (SDGs), specifically Goal 3 on good health and well-being and Goal 6 on clean water and sanitation. The World Health Organization reports that diarrheal diseases, skin infections, and various waterborne illnesses remain major problems in communities with limited access to adequate sanitation services. This condition is exacerbated by uncontrolled urbanization, increasing pressure on water resources, and the degradation of aquatic environmental quality in urban areas.

In Indonesia, rivers hold a paramount position in the development of human civilization. Many major cities have expanded along river streams, transforming riverbank zones into hubs of economic and social activity. Nevertheless, population growth and land-use changes have led to escalating water pollution, declining environmental quality, and various sanitation challenges that directly impact public health.

The city of Banjarmasin is colloquially known as the "City of a Thousand Rivers," possessing a network of over a hundred rivers that shape its spatial character and community life. Rivers are not merely physical urban elements but constitute an integral part of the cultural identity of the Banjar people, which has evolved over hundreds of years (Dwiantoro, 2015). The life of riverbank communities in Banjarmasin is characterized by various activities directly connected to the river, ranging from transportation, commerce, and social interaction to the utilization of river water for domestic needs (Yuliani, 2019; Listiyani & Nopliardy, 2024). This river culture serves as vital social capital in maintaining community cohesion; however, it simultaneously creates a dilemma when traditional practices persist amidst the continuous degradation of the river's environmental quality.

Various studies demonstrate that the water quality of rivers in Banjarmasin is under escalating pressure from domestic activities, household waste, sedimentation, and land-use changes. The natural self-purification capacity of rivers in several areas has been exceeded, rendering them unable to neutralize the pollutant loads entering the water bodies (Zubaidah et al., 2019). This decline in water quality implies an increased health risk for the public who still utilize river water for daily domestic activities. Furthermore, the issue of household solid waste along riverbanks serves as a source of pollution that worsens both environmental quality and public health.

In the context of public health, the relationship between river conditions and community health status has been widely discussed through social-ecological systems approaches. A degraded river environment impacts not only the physical aspects of health but also affects the quality of life, psychological well-being, and social resilience of neighboring communities (Suhren et al., 2014). Research indicates that populations living in polluted river areas tend to

experience higher health vulnerabilities due to exposure to biological and chemical contaminants originating from domestic activities and the surrounding environment.

Despite this, public health development approaches in riverbank areas have long been dominated by structural interventions, such as sanitation infrastructure construction and the provision of physical facilities. Various studies show that the success of sanitation programs is determined not only by infrastructure availability but is also influenced by social norms, local culture, risk perceptions, and community participation levels (Herawati et al., 2022). Therefore, understanding river culture constitutes a crucial aspect of designing effective and sustainable health promotion strategies (Herawati & Setyowati, 2024).

Aside from being a source of various environmental problems, riverbank communities also possess strong social capital to support participatory environmental management. Research on wetland environmental management in Banjarmasin shows that community involvement and strengthening environmental awareness can serve as critical foundations for maintaining river ecosystem sustainability. Riverbank revitalization that accounts for social, cultural, and ecological dimensions has also proven more effective than approaches focusing solely on physical environmental improvements.

Based on the aforementioned context, a research gap persists regarding how water-sharing culture, sanitation behavior, and public health conditions interact to form social-ecological dilemmas in the riverbank areas of Banjarmasin. Most previous studies have focused separately on aspects of environmental quality, river management, or sanitation behavior. Frameworks that integrate socio-cultural dimensions, environmental sanitation, and public health risks into a single analytical model remain relatively limited, particularly in the context of riverine communities in South Kalimantan. Therefore, this study aims to analyze the relationship between water-sharing culture, public sanitation behavior, and environmental health risks among communities residing in the riverbank areas of Banjarmasin. The findings of this study are expected to offer a theoretical contribution to the development of social-ecological systems literature and serve as a foundation for formulating more contextual and sustainable environmental health and river management policies.

RESEARCH METHODS

This study employs a mixed-methods approach with a sequential explanatory design, which combines quantitative and qualitative analyses in a sequential manner to obtain a comprehensive understanding of the relationship between water-sharing culture, sanitation behavior, and the public health risks of riverbank communities (Creswell & Plano Clark, 2018).

The research was conducted in the riverbank areas of the Martapura River and the Kuin River in Banjarmasin City. Quantitative data were obtained through a survey of 250 heads of households selected using a multistage random sampling technique. The collected data encompassed water-sharing culture, sanitation behavior, and public health status.

Subsequently, qualitative data were gathered through in-depth interviews with community leaders, neighborhood heads (RT/RW), and healthcare workers selected via purposive sampling. Field observations and documentation were utilized as supporting data to corroborate the research findings.

Quantitative data were analyzed using descriptive statistics and multiple linear regression to identify the influence of water-sharing culture and sanitation behavior on public health risks. Meanwhile, qualitative data were analyzed using an interactive model comprising data condensation, data display, and conclusion drawing/verification (Miles et al., 2014). The integration of both data types was performed during the interpretation stage to yield a more

holistic overview of the social-ecological dilemma faced by riverbank communities in Banjarmasin City.

RESULTS AND DISCUSSION

Respondent Characteristics

A total of 250 heads of households participated in this study. The majority of respondents were aged 36–55 years (52.8%), male (67.2%), and employed in the informal sector, such as trade, river transportation services, and home-based businesses (58.4%). The educational background of the respondents was dominated by junior and senior high school graduates (71.6%). Most respondents had resided in the riverbank area for more than 15 years (64.0%), indicating a strong social and cultural attachment to the river environment.

Water-Sharing Culture of Riverbank Communities

The survey results indicate that water-sharing culture remains an essential aspect of life for riverbank communities. A total of 78.4% of respondents stated that the river is still used as a space for daily social interaction and communal activities. Furthermore, 69.2% of respondents admitted to still utilizing river water for specific activities, such as washing household utensils and cleaning the surrounding domestic environment.

Additionally, interview results revealed that the river is viewed not only as a water source but also as a symbol of the Banjar people's cultural identity. Activities such as sharing information, mutual assistance among residents, and various social activities are still widely conducted around the river area.

Environmental Sanitation Conditions

Analysis of sanitation conditions indicates that various environmental problems persist in the study area. Approximately 42.8% of households lacked access to sanitation facilities that meet health standards. Furthermore, 37.6% of respondents still performed a portion of their bathing, washing, and latrine activities (MCK) directly in contact with the river body.

Field observations also revealed accumulations of domestic waste at several points along the riverbanks, as well as drainage channels that were not functioning optimally. These conditions have the potential to increase environmental pollution and degrade the quality of the river water utilized by the community.

Table 1. Household Sanitation Conditions in the Riverbank Area

Indicator	Percentage (%)
Possess a hygienic latrine	57.2
Do not possess a hygienic latrine	42.8
Use piped water (PDAM)	48.4
Use groundwater wells	24.8
Utilize river water	26.8
Manage waste properly	53.6
Dispose of waste into the river/waterways	46.4

Public Health Risks

Health data show that environmentally-borne diseases remain quite dominant among riverbank communities. Within the last six months, 31.2% of respondents reported occurrences of diarrhea within their families, while 27.6% reported skin diseases such as dermatitis and pruritus (itching). In addition, 18.8% of respondents reported gastrointestinal infections, which are presumably linked to water quality and environmental sanitation.

Interviews with healthcare workers revealed that cases of environmentally-borne diseases tend to increase during the rainy season, when river water quality degrades and standing water occurs more frequently in residential areas.

Table 2. Types of Environmentally-Borne Diseases Reported by Respondents

Type of Disease	Frequency	Percentage (%)
Diarrhea	78	31.2
Skin diseases	69	27.6
Gastrointestinal infections	47	18.8
Acute Respiratory Infections (ARI/ISPA)	39	15.6
Others	17	6.8

Hubungan Budaya Water-Sharing, Sanitasi, dan Risiko Kesehatan

Multiple linear regression analysis indicates that water-sharing culture exerts an indirect influence on health risks through community sanitation behavior. Sanitation behavior demonstrates a significant negative relationship with public health risks ($\beta = -0,58$; $p < 0,001$), signifying that better sanitation behavior correlates with lower health risks experienced by the community.

Meanwhile, water-sharing culture has a significant positive influence on public social cohesion ($\beta = 0,61$; $p < 0,001$). However, under conditions of declining river environmental quality, the ongoing practice of utilizing river water can increase exposure to health risk factors.

Table 3. Results of Multiple Linear Regression Analysis

Variable	β	t	Sig. (p)
Water-Sharing Culture	214	3.12	2
Sanitation Behavior	-581	-8.47	0
R ² =0.473			

These results demonstrate that the combination of water-sharing culture and sanitation behavior accounts for 47.3% of the variance in public health risks among riverbank communities.

Qualitative Findings

The interview analysis yielded three primary themes:

1. The river as a cultural identity of the community, which reinforces social solidarity and a sense of environmental ownership.
2. The normalization of traditional sanitation practices, particularly the use of the river for domestic activities that have been passed down through generations.

3. Infrastructure limitations and low risk perception, which cause the community to maintain less hygienic sanitation practices despite being aware of river pollution.

The integration of quantitative and qualitative results reveals that the social-ecological dilemma of riverbank communities stems from the interaction between strong cultural values and environmental sanitation constraints. River culture serves as a vital source of social capital for the community; however, it simultaneously acts as a factor that heightens health vulnerability if it is not balanced with improvements in sanitation infrastructure and health behavior modification.

Water-Sharing Culture as Social Capital and a Social-Ecological Dilemma

The findings of this study demonstrate that water-sharing culture remains a fundamental aspect of life for riverbank communities in Banjarmasin. The high intensity of social interactions centered around the river indicates that it functions not merely as a physical resource, but also as a social and cultural arena that shapes community identity. This finding aligns with research by Herawati and Setyowati (2024), which asserts that river culture in Banjarmasin plays a crucial role in building social solidarity, strengthening community relationships, and preserving local values inherited across generations. Similar findings were also reported by Listiyani and Nopliardy (2024), demonstrating that the river holds deep social and cultural significance within the lives of the Banjar people.

From a social-ecological systems perspective, the river is part of a system that dynamically links humans to their environment (Ostrom, 2009). Community dependence on the river generates various social benefits; however, it simultaneously poses risks when environmental quality undergoes degradation. The results of this study highlight a social-ecological dilemma—a condition wherein cultural practices that have historically sustained social cohesion paradoxically have the potential to increase health vulnerability due to changes in environmental quality. This finding supports the study by Suhren et al. (2014), which explains that the health of riverine communities is heavily influenced by the interplay between social, cultural, and ecological factors.

The water-sharing culture that persists among riverbank communities can also be understood through the concept of social capital conceptualized by Bourdieu (1986) and Putnam (2000). High social capital facilitates cooperation and solidarity among community members, but it does not automatically translate into better health behaviors if the prevailing social norms still endorse traditional sanitation practices. Consequently, social capital needs to be integrated into environmental health programs so that it can serve as a transformative force for community behavioral changes.

Sanitation Behavior and Environmental Health Vulnerability

This study reveals that a segment of the community still utilizes the river for specific domestic activities and lacks adequate access to sanitation. This condition demonstrates that sanitation challenges in riverbank areas are influenced not only by individual choices but also by structural factors, such as infrastructure limitations, economic conditions, and access to basic services.

This finding aligns with a study by Daniel et al. (2021), which shows that water, sanitation, and hygiene (WASH) conditions in Indonesian aquatic communities are heavily influenced by social, economic, and institutional factors. Research by Bain et al. (2021) also

reinforces that access to adequate sanitation facilities is a primary determinant in mitigating the risk of environmentally-borne diseases.

From a health behavior perspective, the low ownership of hygienic latrines and the ongoing practice of river-based bathing, washing, and latrine activities (MCK) indicate a gap between health knowledge and the actual behavior of the community. This condition supports health behavior theories stating that behavioral change is influenced not only by knowledge but also by social norms, risk perceptions, and ease of access to supporting facilities (Glanz et al., 2015). Consequently, public health interventions that focus solely on information dissemination are often insufficient to generate sustainable behavioral changes.

Field observations also indicate domestic waste management issues that contribute to the degradation of the river's environmental quality. This finding is consistent with research by Muzaidi et al. (2018), which found that the disposal of household waste into river bodies remains one of the primary sources of aquatic pollution in Banjarmasin. This situation implies that sanitation issues must be understood as part of a broader environmental system rather than merely a matter of individual behavior.

Public Health Risks in Riverbank Areas

The high incidence of diarrhea, skin diseases, and gastrointestinal infections found in this study indicates that riverbank communities still face significant environmental health risks. This finding is consistent with various international studies demonstrating a close relationship between sanitation quality, water quality, and the incidence of environmentally-borne diseases (Fewtrell et al., 2005; Mara et al., 2010; Prüss-Ustün et al., 2019).

According to the World Health Organization (2022), the majority of diarrheal disease cases in developing countries are linked to low drinking water quality, poor sanitation, and a lack of adequate hygiene practices. The results of this study exhibit a similar pattern, wherein households that still depend on river water experience higher incidence rates of environmentally-borne diseases compared to households utilizing safe water sources and proper sanitation facilities.

This finding also supports the results of a study by Cumming et al. (2019), which demonstrated that increasing access to sanitation and hygiene has a significant impact on reducing the incidence of infectious diseases. Furthermore, research by Batterman et al. (2009) emphasizes that controlling waterborne diseases requires an approach that integrates health, environmental, and water resource governance aspects.

Interrelationship Between Water-Sharing Culture, Sanitation, and Health Risks

Regression analysis results show that sanitation behavior has a significant influence on public health risks. The better the household sanitation behavior, the lower the health risks experienced. This finding reinforces various previous studies that position sanitation as a core determinant of public health (Prüss-Ustün et al., 2019; WHO, 2022).

On the other hand, water-sharing culture exhibits a more complex relationship. This culture yields benefits in the form of social cohesion and community support; however, within the context of an already polluted environment, the ongoing practice of river utilization can increase the risk of exposure to pathogenic agents. This finding supports the concept of the *risk environment*, which explains that health risks are determined not only by individual behaviors but also by the social and environmental contexts in which individuals reside (Rhodes, 2002).

Thus, the relationship between river culture and public health is paradoxical. River culture functions as an essential social asset, yet simultaneously poses a risk factor if it is not

accompanied by adaptation to changing environmental conditions. Therefore, public health intervention strategies must consider cultural dimensions as part of the solution rather than as barriers to health development.

Theoretical and Practical Implications

Theoretically, this study reinforces the social-ecological systems approach, which frames public health as a product of interactions among environmental, social, cultural, and institutional factors. The findings demonstrate that sanitation behavior cannot be explained through an individual lens alone; rather, it must be understood within the context of the river culture that has historically evolved within the Banjar community.

Practically, the results indicate that efforts to improve public health in riverbank areas need to be conducted through an integrated approach. The development of sanitation infrastructure must be accompanied by the strengthening of health literacy, community empowerment, and the utilization of community social capital. A river-culture-based approach that engages community figures, local leaders, and riverine communities has the potential to generate more sustainable behavioral changes compared to interventions that are purely technical or structural.

CONCLUSION

This study demonstrates that riverbank communities in Banjarmasin City reside within a social-ecological dilemma, characterized by a robust water-sharing culture and a profound dependence on the river as a social, cultural, and domestic space, amidst the declining quality of the aquatic environment. River culture is proven to serve as social capital that reinforces community cohesion, social solidarity, and local cultural identity. However, ongoing river water utilization practices—particularly for domestic and sanitation purposes—potentially heighten public health risks when unsupported by adequate environmental quality.

The findings indicate that sanitation behavior exerts a significant influence on public health risks. Limited access to proper sanitation facilities, low utilization of safe water, and sub-optimal domestic waste management constitute the primary factors contributing to the high incidence of environmentally-borne diseases, such as diarrhea, skin diseases, and gastrointestinal infections. Conversely, water-sharing culture exhibits a complex relationship; while it yields social benefits, it simultaneously increases health risk exposure if traditional practices of river utilization persist within a degraded environmental context.

Theoretically, this study reinforces the social-ecological systems perspective, which conceptualizes public health as a product of the interplay between environmental, social, cultural, and institutional factors. The novelty of this research lies in its integration of water-sharing culture, sanitation behavior, and public health risks into a single social-ecological analytical framework within the context of riverine communities in Banjarmasin.

Based on these findings, efforts to improve public health in riverbank zones must be implemented through an integrated approach that combines sanitation infrastructure development, enhanced access to safe water, and the strengthening of health literacy, while leveraging social capital and river culture as instruments for behavioral change. Culturally sensitive approaches tailored to the local context are expected to foster more effective, inclusive, and sustainable environmental health governance.

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