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ENVIRONMENTAL DEGRADATION OF THE LOJI RIVER IN PEKALONGAN CITY AND THE EMERGENCE OF A COMMUNITY MOVEMENT 1980–2014

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Abstract

This study aims to examine the factors of environmental changes that occurred in the Loji River as well as community memories regarding the river in the 1980s until the emergence of a community movement. This research employs the historical method which consists of four stages: heuristics, criticism, interpretation, and historiography. In addition, this study also uses the oral history method to explore community memories regarding the condition of the river in the 1980s. Changes in the condition of the Loji River began to appear in the 1990s. These changes were marked by the use of the river as a disposal site for textile and household waste, the decrease in water discharge due to the construction of diversion channels, and the narrowing of the river caused by development along in the riverbanks. Community memories indicate that in the 1980s the Loji River was still in relatively good condition and was used for various daily activities, such as bathing, washing, swimming, and fishing. However, the condition of the river gradually declined until in 2014 a community movement emerged through the establishment of the Komunitas Peduli Kali Loji (KPKL). This community was founded as a from of public concern for the condition of the Loji River in Pekalongan City by carrying out various activities, one of which is river clean-up actions as an effort to encourage the community to maintain the cleanliness and sustainability of the river.

Keywords: Loji river; Pekalongan city; Komunitas Peduli kali loji.

INTRODUCTION

Nek aku nyawang Kali Loji Pekalongan

Kelingan jaman biyen do dolanan

Adus-adusan neng kali ambyur-ambyuran

Jaman biyen banyune resik temenan

Bening koyo banyu nang pegunungan

Song: Kali Loji – Composed by Mas Uuk (2020)

This excerpt from the lyrics represents the community's memories of the Loji River as a playground and source of life in the past. These memories demonstrate that the river is part of the social landscape closely tied to the community's lived experiences. The community's memories of the Loji River are linked to the river's long-standing role in the development of Pekalongan City. The Loji River is part of the Kupang River system, which divides the area of Pekalongan City. The Kupang River in Pekalongan City area has served as a trade route since the 8th century CE, during the Hindu-Buddhist era, connecting inland regions with coastal areas (Dirhamsyah, 2014). The Kupang River continued to develop as a trade route from the 18th century through the early 20th century, as many merchant ships entered the Kupang River area. This is evidenced by the presence of settlements of Chinese and Arab traders, as well as Bugis sailors, in throughout the region (Faikar, 2016). Over time, people have increasingly referred to the Kupang River as the Pekalongan River or the Loji River.

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The presence of rivers is a crucial factor in the growth and development of settlements and economic centers in both coastal and inland regions. Water that flows naturally from upstream to downstream forms rivers as vital landscapes that provide resources, living spaces, and access to mobility for humans (Prastiwi, 2021). Rivers are not merely landscapes but also living spaces that shape the dynamics of surrounding communities. Rivers are also utilized as transportation routes, often serving as connectors between ports and inland areas and supporting the economic activities of the community.

Initially, rivers were used to fulfill various daily needs, such as bathing and washing, then for recreational activities such as fishing and swimming, and later as transportation routes and for agricultural irrigation (Nurlidiawati, 2014). However, the use of rivers has gradually changed due to increased human activity around them. Rapid development and urbanization have led to a shift in the function of rivers, particularly through the conversion of riverbanks into residential areas and sites for economic activities (Budiono, W, & Shofwan, 2017). Furthermore, industrial and residential development along riverbanks has accelerated environmental degradation due to waste disposal activities, which have resulted in the loss of the river's social and economic functions in daily life (Anggraeni, 2023).

Changes in the river's function due to construction and industrial development have also occurred along the Loji River in Pekalongan City. The river, which served as a transportation route in Pekalongan City from the 18th century to the early 20th century, gradually underwent a shift in function as industrial and residential activities expanded around it. Although the river's condition in the 1980s still allowed the community to use it for daily needs, changes began to emerge as industrial activities around the river increased. In 1989, the Badan Pengendali Dampak Lingkungan (BAPEDAL) launched Program Kali Bersih (Prokasih; Clean River Program) as an effort to improve river water quality in accordance with its designated uses, through the control and reduction of waste entering the river. The implementation of this program was subsequently reinforced by the enactment of Government Regulation of the Republic of Indonesia No. 20 of on 1990 Water Pollution Control, which serves as the legal basis for the monitoring and control of water pollution.

The implementation of Prokasih in Pekalongan City has not yet been fully effective. Prokasih is a program that encourages industries located near rivers to build wastewater treatment facilities to prevent water pollution (Kumalasari, 2018). However, in the early 1990s, it was found that a number of textile industries were discharging liquid waste into the Loji River and did not have wastewater treatment facilities. This situation was reported in the Bernas newspaper (1992) in an article titled "30 Perusahaan Diperintahkan Bangun Instalasi Pengolah Limbah," which stated that 10 companies in Pekalongan City were required to build wastewater treatment facilities as part of the Prokasih. These findings indicate that pollution in the Loji River began to attract attention as early as the 1990s. In the following years, pollution increased due to the discharge of waste into the river, leading to a decline in water quality and reduced use of the river by the community. These conditions were the result of continuously expanding industrial activities, which caused the Loji River to experience a decline in water quality and to fall into the category of moderately polluted, due to industrial batik wastewater being discharged directly into the Loji River (Safamaura & Afany, 2025).

Efforts to control pollution have been underway since the early 1990s, but the water quality of the Loji River continued to decline in the years that followed. The ongoing pollution and environmental degradation of the river spurred civil society initiatives to become actively involved in river conservation efforts. The Komunitas Peduli Kali Loji (KPKL), established in 2014, was formed in response to the deteriorating condition of the Loji River. This community emerged as a form of public participation in preserving the river, addressing river pollution, and carrying out various activities to reduce the impact of industrial waste and solid waste in the Loji River.

The Loji River continues to face serious, ongoing issues. The Loji River holds not only ecological value but also historical and social significance for the surrounding community. Previous studies on the Loji River have examined it from various perspectives and with different focuses. A study by Maula et al. (2024), which analyzed the water quality of rivers in Pekalongan City,

including the Pekalongan River, using physical, chemical, and microbiological parameters, revealed that the Pekalongan River has exceeded water quality standards, likely due to waste being directly discharged into the river. Meanwhile, Kamilia (2023) examined pollution control of the Loji River from a fiqh siyasah perspective by analyzing the role and policies of the local government through regulations, supervision, and the provision of waste control facilities, finding that the policy direction is relatively appropriate, but its implementation has not been optimal.

Additionally, Nabila's (2025) study examines community participation in the Komunitas Peduli Kali Loji (KPKL) in reducing pollution in the Loji River through various social activities. The historical framework regarding the function of rivers in urban development is further enriched by Dirhamsyah's (2014) work, which highlights the role of the Kupang River as the lifeblood of the city since the 8th century CE, shaping settlement patterns, serving as a transportation route, and fostering trade activities. However, these previous studies have not yet explained how environmental changes in the Loji River occurred gradually and involved community participation. Therefore, this study aims to fill this gap in the literature regarding historical environmental changes in the Loji River.

This study requires certain limitations to ensure that the discussion remains focused and does not become too broad. The limitations include spatial and temporal scopes. Spatially, this study focuses on the Loji River in Pekalongan City, as this river holds significant historical importance. Having served as a trade route from the 18th century to the early 20th century, the river has undergone a functional shift in the modern era. The temporal scope of this study is set for the period 1980–2014, with 1980 chosen as the starting point because, at that time, the Loji River was still actively used by the community to meet daily needs and marked the beginning of its functional transformation. The year 2014 was chosen as the end of the study period due to the emergence of public awareness regarding the environmental condition of the Loji River, marked by the establishment of the Komunitas Peduli Kali Loji (KPKL). Thus, this timeframe is considered representative of the dynamics of the river's functional transformation and its environmental condition within the study period.

This study aims to examine the environmental history of the Loji River in Pekalongan City from 1980 to 2014, positioning the community as an actor in the process of environmental change in the river. The main focus of this study is the factors driving environmental changes in the Loji River and how the river's functions and conditions evolved between 1980 and 2014. This study also explores the community's collective memory of the Loji River as an important living space in daily life, and how this memory has contributed to the emergence of a community-based social movement for river conservation. Thus, this study is expected to contribute to the development of river environmental history studies in Indonesia by integrating ecological aspects and community participation.

RESEARCH METHOD

This study employs historical methods to reconstruct past events through systematic stages, including heuristics, source criticism, interpretation, and historiography. The heuristic stage involves collecting sources relevant to the study, including both primary and secondary sources related to the Loji River. Next, source criticism is conducted, consisting of external criticism to test the authenticity and validity of the sources, as well as internal criticism to assess the information contained within the sources. In the interpretation stage, the historical facts obtained through the criticism stage are analyzed and interpreted to understand the cause and effect relationships and the context of the changes that occurred. The results of this interpretation are then organized into a coherent historical narrative through the historiography stage (Gottschalk, 1985).

In addition, this study also employs oral history as a method of data collection to explore the memories, experiences, and perspectives of individuals who were directly involved with or had close ties to the Loji River in the 1980s. Oral history is a method used to record oral narratives from witnesses or historical actors through interviews, which are then analyzed as part of historical evidence to reconstruct the past (Thompson, 2012). Oral history is viewed as an important source

for revealing collective experiences and memories that are often not recorded in written documents. In this study, oral history is used as an alternative source to reconstruct the conditions of the Loji River in the 1980s, given the limited availability of written documents and archives from that period.

This study employs an environmental history approach to explain the relationship between humans and their environment. Nawiyanto (2012) states that environmental history places humans and their environment within a single analytical framework to understand how environmental changes are influenced by human activities. Through the environmental history approach, this study will examine the factors driving environmental changes occurring in the Loji River, as well as how the community's memories of the Loji River subsequently fostered public awareness through a community organization known as the Komunitas Peduli Kali Loji (KPKL).

The sources used in this study include interviews with residents living near the Loji River, who possess knowledge and firsthand experience regarding changes in the river's condition from 1980-2014, as well as the Komunitas Peduli Kali Loji(KPKL). In addition, this study also utilized contemporary newspapers, such as Suara Merdeka, Kompas, Bernas, Berita Yudha, and Analisa, as well as visual sources in the form of photographs, maps, and documentation of the river's condition obtained from members of the Komunitas Peduli Kali Loji (KPKL), and statistical documents published by the Badan Pusat Statistik (BPS; Central Statistics Agency) of Pekalongan City. Meanwhile, secondary data consits of journal articles and previous research findings, such as theses discussing the environment, river pollution, and studies on community movements.

RESULT AND DISCUSSION

Factors Causing Environmental Degradation of the Loji River 1990-2014

Figure 1. The Pekalongan river between the 19th and 20th centuries

(Source: KITLV)

The Loji River is part of the Kupang River Basin, the main river system that divides the central area of Pekalongan City and flows into the Java Sea. Geographically, the upper reaches of the Kupang River Basin are located in the Rogojembangan Mountains in Pekalongan Regency. The river then flows downstream through Pekalongan City before finally emptying into the northern coast of Java. In various sources, this river is referred to as the Kupang River or the Pekalongan River. However, local residents more commonly refer to it as the Loji River due to the presence of a "*loji*", a fortress or trading post established in the 18th century by European trading companies. Historically, the Loji River was known as a waterway located near the port area; thus, from the Hindu-Buddhist era through the colonial period, it was utilized as a transportation and trade route connecting coastal and inland areas (Dirhamsyah, 2014).

Entering the 1990s, Pekalongan City experienced significant development accompanied by population growth and urban economic activity. Data from the Badan Pusat Statistik (BPS; Central Statistics Agency) of Pekalongan City show a consistent increase in population from 1990 to 2014. This increase was accompanied by the expansion of residential areas and a rise in industrial activity, particularly in the textile and batik industries. Although in the 1970s the batik industry faced

pressure due to the influx of imported printed fabrics, which reduced the competitiveness of traditional batik (Maninggar, 2018), since the mid-1970s a process of adaptation in batik production began through the adoption of printing technology, making production more modern and efficient (Fatikha & Rakhmanto, 2025). This development subsequently drove a significant increase in batik production in the following years.

The batik industry in Pekalongan City makes a significant contribution to the local economy but at the same time places pressure a strain on the urban environment, including the Loji River (Haryati, 2018). Between 1990 and 2014, the condition of the Loji River showed environmental degradation marked by a decline in river water quality (Mratihatani, Susilowati, Rzhyhu, & Lqgx, 2013), as well as a reduction in the river's function as a social space for the community. Based on interviews with the chairperson and members of the Komunitas Peduli Kali Loji (KPKL), the environmental degradation occurring in the Loji River is influenced by the discharge of industrial and domestic waste, the construction of river diversion channels as a flood mitigation measure that affects the flow system, and the narrowing of the riverbanks due to land-use conversion (Wawancara: Antoni, 2025; Wawancara: Titik Nuraini, 2025).

Waste Disposal

Rivers are often used as dumping grounds for both industrial and domestic waste, particularly in urban areas where economic activity and residential development are expanding. The discharge of industrial and domestic waste into rivers serves as a source of pollution, leading to a decline in water quality, disruption of aquatic ecosystems, and a reduction in the ecological functions of rivers (Indriyani, Sudarti, & Yushardi, 2024). This situation is evident in the Loji River, which has become one of the rivers affected by waste disposal activities since the 1990s.

1. Textile Industry Waste

Pekalongan City is known as the "City of Batik," as it has developed since the 19th century as a center for batik production and trade. Over time, Pekalongan has grown into one of Indonesia's major batik-producing cities, with its products distributed throughout the country and exported abroad. Batik production in Pekalongan is part of the textile industry sector, which has served as the main pillar of the local economy and the livelihood of its people (Hayati, 2012). Thus, batik is not only recognized as a cultural heritage but also as an economic activity that underpins the city's production and trade dynamics.

The development of batik in Pekalongan has experienced ups and downs in tandem with changes in production technology. In the 1960s, a number of textile industry actors, particularly in the batik sector in Pekalongan began introducing batik technology using printing machines, thereby accelerating production and gradually causing traditional batik businesses to decline (Fatikha & Rakhmanto, 2025). Additionally, the introduction of chemical dyes that produce brighter and more varied colors became increasingly widespread in the batik production process (Hayati, 2012). These changes brought economic and production benefits to the batik industry, but at the same time, they had environmental consequences, particularly in terms of the increasing volume of untreated wastewater discharged into rivers.

The environmental impact of textile industry activities has worsened, as evidenced by the Kupang River being prioritized in the Program Kali Bersih (Prokasih) in 1992. The Loji River, which is part of the Kupang River basin, also known as the Pekalongan River, is one of the rivers receiving liquid waste from surrounding industrial areas. In 1994, Kompas reported that the Loji River was polluted due to waste discharge from textile factories and home-based batik industries. In the same year, the Pekalongan City Government pressured 10 textile factories to establish wastewater treatment units by the end of March 1994 (Berita Yudha, 1994; Kompas, 1994). Nevertheless, this situation persisted into the following year. In 1995, Berita Yudha again reported that several textile factories were still discharging waste into the river and had not yet established wastewater treatment units (Berita Yudha, 1995).

Wastewater discharged into the Loji River consists of liquid waste generated from textile production and dyeing processes. The textile production process includes several stages preparation, dyeing, washing, and finishing each of which produces wastewater with distinct characteristics and pollutant levels. This wastewater generally contains residues of synthetic dyes and hazardous chemicals that can degrade water quality. The presence of organic matter, chemicals, and suspended solids in textile wastewater is reflected in high levels of Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and Total Suspended Solids (TSS), which originate from production processes as well as residual fibers and particles (Wang, Jiang, & Gao, 2022). The long-term discharge of wastewater with these characteristics into the Loji River has caused changes in water quality, turning the river murky or black in color and producing an unpleasant odor.

The deterioration of the Loji River's condition led residents living along the river to begin protesting and complaining about the large amount of wastewater flowing into the river. In the 1995 edition of Berita Yudha, in the "Singkat Nusantara" column, it was reported that many residents along the Loji River were concerned because the water they used for daily needs had become contaminated with industrial waste (Berita Yudha, 1995a). This situation continued until 1997, when many people living near the Loji River experienced difficulties accessing clean water because both river water and wells had become contaminated; using the water even caused their skin irritation (Pangroso, 1997). This situation was, of course, highly detrimental to the communities living near the river, particularly for those who relied on the river for their daily needs.

The discharge of waste into the river continued in the following years. In 2002, through the newspaper *Kompas* (2002), an article titled "436 Industri di Jateng Buang Limbah B3" reported that the Loji River was one of the rivers in Central Java affected by hazardous and toxic waste (B3, *Bahan Berbahaya dan Beracun*) pollution. The report explained that industrial activities without adequate wastewater treatment facilities (*Instalasi Pengolahan Air Limbah* / IPAL) contributed to the decline in river water quality; even some companies that already had IPAL facilities continued to discharge their waste directly into the river without proper treatment. This condition indicates that waste management had not been implemented optimally, so pollution in the Loji River continued.

The condition of the Loji River gradually declined. In response to this phenomenon, the Pekalongan City government has made efforts to manage waste over the years, although these efforts have not been fully effective. One of the measures taken by the Pekalongan City government to address pollution was the construction of wastewater treatment facilities (*Instalasi Pengolahan Air Limbah* / IPAL) in batik industrial centers. This plan was reported in the *Kompas* (2008) article titled "Pemkot Pekalongan Akan Membangun IPAL Lagi." However, the existing waste treatment capacity was insufficient to accommodate the volume of waste, resulting in some waste being discharged into drainage channels and eventually flowing into the river. This condition shows that efforts have been made by the government, although their implementation has not fully resolved the problems in the Loji River. This issue requires community participation, so that pollution control does not rely solely on infrastructure such as wastewater treatment facilities, but also on the active involvement of local communities in maintaining and managing the environment (Mumpuni, Rahayu, & Rini, 2020).

2. Domestic Waste

Domestic waste is waste generated from the remnants of community activities that are no longer used, including liquid waste such as water from washing, bathing, and kitchen activities, as well as solid waste in the form of organic and inorganic materials (Hasibuan, 2016). The increase in the volume of domestic waste generally occurs in line with population growth and the intensity of household activities, which also leads to an increase in the amount of waste produced. The large number of people who dispose of domestic waste directly into the environment causes pollution, especially in rivers that pass through densely populated residential areas. This condition is generally influenced by the lack of knowledge regarding domestic waste management and the hazards of domestic waste (Sunarsih, 2014).

The increase in domestic waste has become a problem in urban areas, including Pekalongan City. Urban population growth contributes to the increase in the volume of solid waste and domestic waste generated. Data from the *Badan Pusat Statistik* (BPS; Central Statistics Agency of Indonesia) of Pekalongan City (2004) show that waste production in Pekalongan City increased from 1999 to 2003, in line with population growth and community activities. Domestic waste that has the potential to cause environmental pollution includes organic waste and plastic waste. Data from the *Badan Pusat Statistik* of Pekalongan City (2014) show that in 2010–2013, organic and plastic waste constituted a relatively high proportion compared to other types of waste. In residential areas traversed by rivers, such as the Loji River, these areas have the potential to become sites for the disposal of domestic waste, which leads to a decline in river water quality.

In the newspaper *Kompas* (2002) it was reported that environmental pollution in Central Java, including the Loji River, was worsening due to the large amount of domestic waste being disposed of indiscriminately, while communal waste management was difficult to implement because of the dispersed locations of households. In addition, observations based on satellite imagery recorded between 2003 and 2013 through Google Earth show an increase in the number of settlements around the river, which have the potential to contribute to domestic waste. Furthermore, information obtained through interviews with informants, namely Dewi (26) and Titik (59), indicates that in 2014 there were many public toilets along the riverbanks. The presence of these facilities indicates that the river was used as part of the community's sanitation system, which indirectly contributed to the pollution load of the river (Wawancara: Dewi, 2026; Wawancara: Titik Nuraini, 2025).

Domestic waste discharged directly into the river body gradually reduces water quality (Amru & Makkau, 2023). The condition of the Loji River in 2014 is shown in Figure 2, obtained from members of the *Komunitas Peduli Kali Loji* (KPKL), which depicts the river as murky and filled with domestic waste. Based on observations of the image, the presence of domestic waste and the visible change in the color of the river water indicate an increase in the pollution load associated with community activities around the Loji River. This shows that environmental degradation in the Loji River has occurred gradually through continuous interactions between humans and the river over a long period of time.

Figure 2. Condition of the Loji River in 2014
(Source: Documentation from the Komunitas Peduli Kali Loji)

The discharge of poorly managed household waste can increase pollution parameters such as Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), and Dissolved Oxygen (DO), thereby reducing oxygen levels in the water and degrading water quality (Fernanda & Husamah, 2025). Polluted river water can no longer be used to meet daily needs; this pollution occurs due to the large number of pollutants entering the river body. This pollution is characterized by changes in water color to murky or dark, the emergence of unpleasant odors, and sedimentation caused by the accumulation of waste at the bottom of the river. This condition has an impact on public health and leads to various diseases, such as diarrhea and skin diseases such as scabies and ringworm(N. M. N. B. S. Dewi, 2021). The decline in river water quality indicates that household waste has a significant impact on the function of the river as a living space for the surrounding community. Likewise, the condition of the Loji River in 2014 already showed a significant decline in water quality.

River Diversion

Flooding in Pekalongan City is not a new phenomenon; rather, it has occurred since the Dutch East Indies era. The newspaper *De Locomotief*, published on March 17 (1933) reported that several areas in Pekalongan City were flooded, while the Pekalongan River, which had previously been relatively calm, had turned into a raging current. Flooding in Pekalongan City is often attributed to the geographical conditions of the coastal area, as well as other environmental factors that worsen the urban area's capacity to manage water. These recurring floods subsequently spurred various water management efforts dating back to the colonial era, including the construction of dams and water channels. This situation indicates that technical interventions in the river have long been part of the response to recurring flood problems in Pekalongan City, a practice that has continued into the modern era.

Changes in river conditions are not only related to pollution caused by the discharge of wastewater into the river but are also influenced by human-induced physical alterations to the river channel. One such form of physical alteration is a diversion channel. A diversion channel is a structure built to divert or regulate river flow with the aim of reducing flood discharge in a specific area (Ginting, 2015). The construction of a diversion channel in the Pekalongan area was carried out in the upper reaches of the Pekalongan River as part of river flow management efforts aimed at flood control in Pekalongan City. The construction of the diversion channel was not carried out suddenly but was related to the long-standing flood problems faced by Pekalongan City.

An examination of maps published by the *Badan Pusat Statistik* (BPS; Central Statistics Agency of Indonesia) in the book *Pekalongan City in Figures* reveals differences in river flow patterns between the 1988 and 2008 maps. On the 1988 map, the river flow appears relatively straight and does not yet show any branching. Meanwhile, on the 2008 map, river branching is visible in the Kuripan Lor area of Pekalongan City. These differences in flow patterns indicate physical changes to the river channel, which are suspected to be related to the construction of a diversion channel as a flood control measure in Pekalongan City, as shown in Figure 3. This diversion channel alters the river flow to reduce water discharge. These changes also affect the distribution of river flow, which, in the long term, impacts the physical condition and function of the river.

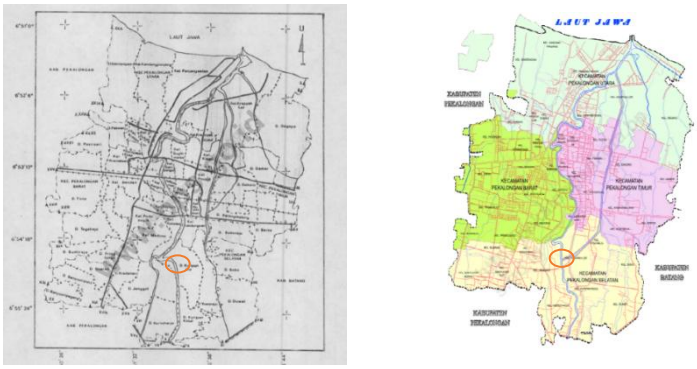

Figure 3. Changes in the flow pattern of the Pekalongan river based on BPS maps from 1988 and 2008 (Source: Badan Pusat Statistik (BPS), processed by the author)

Based on a review of available sources, the construction of the diversion channel on the Pekalongan River began in the early 2000s. As reported by *Kompas*, the Pekalongan City Government had been planning the construction of the diversion channel since 1999, and the project was revisited in 2002 in response to floods that struck parts of Pekalongan City (Kompas, 2002a). The Final Accountability Report of the Mayor of Pekalongan for the 2000–2004 term notes that during this period, the construction of the diversion channel was carried out as part of flood control efforts. Furthermore, the final report of the study on the Pekalongan River estuary, published by the Pekalongan City Regional Development Planning Agency (*Bappeda*), states that the diversion channel between the Pekalongan River and the Banger River was constructed in 2003

(Karya, 2018). Thus, the construction of the diversion channel on the Pekalongan River is part of flood control measures that had been planned since the 1990s.

The construction of a diversion channel on the Pekalongan River is considered quite effective as a flood control measure in Pekalongan City. However, the existence of this diversion channel also has an impact on the river's environmental conditions. Changes in water flow patterns resulting from the diversion of part of the river's flow have caused the water to flow more slowly than before (Ginting, 2015). This reduced flow is one of the causes of increased sedimentation at the river mouth, leading to siltation. This relatively low and stagnant flow further exacerbates river pollution, as the river's ability to perform natural self-purification is reduced (Flatley, Rutherfurd, & Hardie, 2018).

Changes in the flow pattern of the Pekalongan River due to the construction of the diversion channel have also affected the downstream river system, namely the Loji River. Based on interviews with Mr. Adi and Mr. Antoni, the diversion channel was designed to redirect 70% of the Pekalongan River's flow toward the Banger River, leaving 30% of the flow entering the Loji River (Wawancara: Adi Setijono, S.P, 2026; Wawancara: Antoni, 2025). As a river segment within an urban area, the reduced water flow results in a slower-moving river that is less capable of optimally transporting sediment, particularly during the dry season. These conditions promote sediment deposition and exacerbate the accumulation of pollutants from activities along the river, thereby contributing to environmental degradation in the Loji River.

Narrowing of the Loji River Due to Buildings Along the Watershed

The changes occurring in the Loji River are also influenced by the narrowing of river space due to building development along the riverbanks. This development, driven by population growth in urban areas, has led to the expansion of residential areas into land along the river edges. This narrowing is related to changes in land use within the river buffer zone, which is a protected area that functions to preserve the river ecosystem and control flooding (Amin, Mubarak, Zulkarnain, & Gunawan, 2025). Changes in the river buffer zone reduce the river's flood storage capacity, which may at times lead to flooding and even riverbank erosion (Maryono, 2014).

Based on satellite imagery accessed via Google Earth, the condition of the Loji River in 2003 still showed a relatively wide river channel, and narrowing was not yet significantly visible, as shown in Figure 4. However, in the 2003 imagery, buildings encroaching into the river buffer zone had already begun to appear. This indicates the early stage of land use change in the river area. This situation is supported by a report in *Suara Merdeka* (2005) in an article titled "Bangunan Menjorok Aliran Kali Loji Menyempit," which stated that several buildings had occupied the river buffer zone and violated the regulation on riverbank width, which is 10 meters. This indicates that in the early 2000s, there were changes in land use within the river buffer zone that had the potential to reduce the river's capacity to accommodate water flow.

Map 4. Loji River Basin Map 2003
(Source: Google Earth)

These developments led to further changes in the Loji River in the years that followed. The narrowing of the river channel can be identified by comparing satellite imagery from 2003 and 2013.

In 2003, the river's width and riparian zone were still relatively wide, so the river's function as a flow channel and a buffer zone between the water body and surrounding human activities was still quite evident. However, by 2013, as shown in Map 5, significant physical changes were evident. The river's width appears to have narrowed, and the riparian zone has been reduced in various sections. At several points, the river channel has narrowed, and the riparian zone no longer functions optimally as a buffer zone, as it has been converted into residential areas. These changes indicate that the narrowing along the Loji River is due to the high density of residential settlements (S. P. Dewi, Widjajanti, Ristianti, Teknik, & Diponegoro, 2022).

Map 5. Loji River Basin Map 2013
(Source: Google Earth)

In addition to altering the physical characteristics of the river, the density of buildings in the Loji River riparian zone also increases environmental pressure on the river. Human activities taking place ever closer to the riverbed have the potential to increase the influx of household waste and trash into the river, thereby degrading water quality. The reduction of the riparian zone leads to a decline in vegetation around the river, which plays a crucial role in filtering sediment and pollutants before they enter the water body; consequently, the river's natural capacity to maintain water quality is weakened (Locke, 2024). Furthermore, the narrowing of the riverbank area reduces the space for water runoff and the function of vegetation as an ecological buffer for the river, potentially increasing the risk of flooding in the areas surrounding the Loji River if the river cannot accommodate the water within it. Thus, the narrowing of the Loji River's banks not only impacts the river's physical changes but also contributes to the decline in river water quality.

Community Memories of the 1980s and the Komunitas Peduli Kali Loji 2014

The Loji River has served as a vital waterway in the city of Pekalongan from the Hindu-Buddhist era through the colonial period (Dirhamsyah, 2014). In the past, the river served as a source of life for the community, primarily by providing water for daily needs, and later as a trade route connecting inland areas with the coast (Adi, 2019; Yulita, 2020). Communities living near the river often utilized it as a space for interaction, such as washing, bathing, and recreational activities like swimming and fishing (Prihartini, 2013). The close relationship between the community and the Loji River was not merely functional but also shaped collective experiences that were subsequently embedded in community memory. These memories reflect the social relationship between the river and the surrounding community.

Community memories of the Loji River in the 1980s indicate that the river was still relatively clean and actively used by local residents. Titik Nuraini (59) recalls that during her childhood, the Loji River served as a playground where children bathed and swam together. A similar account was shared by Agus Salim (57), who stated that the Loji River was still clean at that time and functioned as a recreational space for children of his generation. Ahmad Zarkasi (47) noted that the river's condition in the 1980s still appeared clear with a natural green color, meaning it had not yet been significantly polluted. He also recalled that some residents regularly washed clothes in the river and that there were many small boats used for fishing fish and shrimp. These various activities indicate that the Loji River was still functioning well and served as a social and economic space utilized by the surrounding community (Wawancara: Agus Salim, 2026; Wawancara: Ahmad Zarkasi, 2026; Wawancara: Titik Nuraini, 2025).

However, the condition of the Loji River has not always been the same as remembered by the community. Along with the development of Pekalongan City and increasing activities along the riverbanks, the water quality of the Loji River began to decline around the 1990s. The river, which had previously served as a source of life and a space for social interaction, began to experience pressure due to population growth and improper waste disposal, eventually leading to a decline in urban river water quality (Haryono, Soesilo, & Agustina, 2024). This change did not occur suddenly but developed gradually over time, with conditions worsening by the 2000s. This led to a reduction in community activities along the river compared to the 1980s (Wawancara: Agus Salim, 2026). (Interview: Agus Salim, 2026). These changes indicate a shift in the relationship between humans and the river, from a direct and functional relationship to one that has become increasingly distant due to environmental degradation.

The issue of river pollution in Pekalongan continues to persist. An opinion article titled "Bercermin pada Air Sungai," published in *Kompas* (Har, 2009) describes how changes in river water color caused by batik waste have become a social issue recognized by the community. The article states that river pollution in Pekalongan is not only understood as an industrial technical problem but is also related to production patterns and waste management practices that lack environmental awareness. In addition, the presence of numerous public toilets along the riverbanks in 2014 indicates that residents discharged waste directly into the river, further contributing to the river's declining condition. This situation highlights the contrast between community memories of a clean river in the 1980s and the river's condition in 2014. This change demonstrates environmental degradation in the Loji River, which has subsequently generated public concern.

The changes occurring in the Loji River have fostered social awareness within the community. In November 2014, the Komunitas Peduli Kali Loji (KPKL) was established, initiated by Titik Nuraini (59). The origin of this community stemmed from concerns regarding the condition of the river, which were expressed through social media, specifically Facebook, which served as a space for discussion and later developed into concrete action. Initially, the community was named Aksi Pekalongan Bersih before later being renamed Komunitas Peduli Kali Loji (KPKL). In the same year, KPKL organized a river-cleaning campaign involving community participation as its first activity, engaging various stakeholders at the city, regency, provincial, and national levels, as well as members of Aksi Jakarta Bersih as a form of cross-regional solidarity. This activity marked an important shift, where the community began to actively take part in protecting the Loji River (Wawancara: Titik Nuraini, 2025). Based on the Legal Entity Certificate (2015), Komunitas Peduli Kali Loji (KPKL) was officially legalized on 15 September 2015 as an association Perkumpulan Komunitas Peduli Kali Loji through the decision of the Minister of Law and Human Rights of the Republic of Indonesia.

After its establishment in 2014, Komunitas Peduli Kali Loji (KPKL) continued its activities in caring for rivers in the Pekalongan area. The community remained active in organizing regular programs while also utilizing social media, specifically Facebook, as a platform for communication, documentation, and environmental awareness campaigns. Social media was considered effective in promoting social movements at that time, as it helped gain wider support and maintain public participation (Kapriani & Lubis, 2014). Between 2015 and 2018, KPKL organized the Festival Kali Loji to commemorate the community's founding and to promote awareness of the importance of maintaining river cleanliness and sustainability. The event included a series of activities, such as a rowing competition held on the river and river-cleaning actions. These activities were intended to preserve and demonstrate that the Loji River has the potential to function as a recreational and leisure space when it is clean and well-maintained (Wawancara: Titik Nuraini, 2025).

Figure 5. River Clean-Up Action Conducted by KPKL, 2015
(Source: Documentation from Komunitas Peduli Kali Loji together with Forum Rakyat Pekalongan Bersatu)

The river clean-up activities carried out by KPKL were not limited to the Loji River but were also conducted in other rivers within the Pekalongan Regency and City areas. The series of activities undertaken by KPKL represents community efforts to restore the river's function as a public space, as well as to reconstruct the meaning of the Loji River prior to its pollution. In addition, KPKL is also actively involved in social outreach programs related to waste management conducted in schools and community activities, the implementation of the Sekolah Sungai (River School) program as an educational initiative on the importance of river conservation, and the proposal for the construction of Wastewater Treatment Plants (Instalasi Pengolahan Air Limbah/IPAL) to the relevant authorities (Nabila, 2025). The following are environmental activities carried out by KPKL in maintaining river environments in Pekalongan, including the Loji River.

Year	Acticity Name	Location
2014	Aksi Bersih Sungai	River Loji (Panjang Wetan Subdistrict) and the Bremi River (Tirto Subdistrict)
2015	Aksi Bersih Sungai dan Festival Kali Loji I	Sungai Loji (Panjang Wetan Subdistrict), Sungai Bremi (Tirto Subdistrict), Sungai Setu (Jenggot Subdistrict)
2016	Gerakan Pungut Sampah, Aksi Bersih Sungai, dan Festival Kali Loji II	Kraton Stadium Field, Alun-Alun Field, Mataram Field, Patiunus Park, Loji River (Panjang Wetan Subdistrict), and Bremi River (Tirto Subdistrict)
2017	Gerakan Pungut Sampah, Festival Kali Loji III	Patiunus Park dan Loji River (Panjang Wetan Subdistrict)
2018	Gerakan Pungut Sampah, Festival Kali Loji IV	Patiunus Park, Jetayu Park, and Loji River (Panjang Wetan Subdistrict)
2019	Aksi Bersih Sungai	Samborejo Irrigation Channel (Tirto)
2020	Gerakan Lihat Sampah dan Ambil (Gelisa), KPKL Peduli Lingkungan dan Covid-19	Jetayu Field (Pekalongan Utara), Krapyak, Panjang, Bugisan, Sembawan, Pesindon, Kauman, dan Sapuro
2021	Sekolah Sungai dan Aksi Bersih Sungai	Post of Sekolah Sungai KPKL (Jetayu), Bremi River (Tirto Subdistrict), and Loji River (Panjang Wetan Subdistrict)
2022	Aksi Mitigasi dan Adaptasi Selamatkan Kali Loji	Jetayu Field (Pekalongan Utara)
2023	Aksi Bersih Sungai dan Kampanye Gerakan Pilah Sampah dari Rumah	Loji River (Panjang Wetan Subdistrict)

2024	Aksi Bersih Sungai dan Sekolah Sungai	Bremi River (Tirto Subdistrict), Loji River (Panjang Wetan Subdistrict), and Sapuro River
2025	Sosialisasi dan Edukasi Pilah Sampah dan Aksi Bersih Sungai Loji	Medono (Podosugih Subdistrict), Loji River (Panjang Wetan Subdistrict)

Table 1. Environmental Activities of the Komunitas Peduli Kali Loji (KPKL), 2014–2025
(Source: Facebook of the Komunitas Peduli Kali Loji (KPKL) and KPKL Activity Reports, 2020, 2022, 2024)

Based on the table above, KPKL has carried out various activities to preserve the rivers in the Pekalongan area, particularly the Loji River. These activities demonstrate community involvement in maintaining river environmental conditions. River clean-up actions are among the most frequently conducted activities as a direct response to waste problems in the Loji River and other rivers in the Pekalongan area. These activities not only function as efforts to address environmental problems but also serve as a means of raising public awareness and concern for rivers as an integral part of their lives (Loji, 2020, 2022, 2024).

CONCLUSION

This study shows that the changes occurring in the Loji River in Pekalongan City from 1980 to 2014 resulted from the interaction between ecological factors and human activities along the river. The initial decline in the water quality of the Loji River was caused by the discharge of industrial and domestic waste, which began to increase in the 1990s. Second, it was caused by the construction of a diversion channel as a flood mitigation measure in Pekalongan City, which paradoxically reduced water flow and thereby accelerated the pollution process. Third, the narrowing of the riverbanks due to land-use pressure further exacerbated the river's environmental degradation. In the 1980s, the Loji River was still in a clean and natural condition and functioned as a social space for the community. The river served as a gathering place where people washed clothes, bathed, swam, and fished using small boats. The gradual deterioration of the river's condition shifted these social functions and created a growing disconnect between the community and its environment. The decline in the water quality of the Loji River subsequently triggered collective community awareness, which was manifested through the establishment of the Komunitas Peduli Kali Loji in 2014. The emergence of the Komunitas Peduli Kali Loji demonstrates the presence of environmental memory that evolved into a community movement in response to the ecological crisis. Thus, the changes in the Loji River not only reflect physical environmental transformations but also reveal the reciprocal relationship between the environment, collective memory, and community movements within the local history of Pekalongan City.

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