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Juridical Analysis of Flood Management in the Context of Drainage Management in Cirebon City

Rangga Dwi Pahdiansyah , Atha Salsabila Zulfa, Moh Mufarrihunnufus, Moh Sigit Gunawan, Deni Yusup Permana *

Faculty of Law, Swadaya Gunung Jati University, Cirebon, Indonesia
*Email (corresponding author): deniyusuppermana80@gmail.com

Abstract. *Flood management is a series of efforts to prevent, reduce, and deal with the impacts of floods, which can threaten human safety, damage the environment, and disrupt social and economic activities. This study aims to analyze the effectiveness of a regulation on flood management and drainage management in Cirebon City. This research will use Qualitative methods. Data collection was carried out through interviews. This study found that limited trained human resources and insufficient budget hinder the implementation of flood management and drainage improvement programs. The condition of drainage infrastructure that needs maintenance, such as the number of channels damaged or blocked due to sedimentation and closure by buildings, is also a factor that causes waterlogging and flooding. This research contributes to the development of legal science, especially in environmental law and spatial planning law.*

Keywords: *Flood management, drainage management, and flood*

1. Introduction

Cirebon is a city in West Java that is close to the north coast, where water flows from upstream to downstream to reach the coastal sea. However, due to many changes in plans such as the construction of illegal buildings regulated in Law Number 28 of 2002 concerning Buildings, which in Article 45 governs the government's authority to regulate buildings without permits (1), as well as the lack of public awareness of drainage causes a continuous flood phenomenon when rain arrives. Rain that lasts for a long time and has high intensity can cause flooding, especially when the river cannot accommodate the volume of incoming rainwater, coupled with a reduced water catchment area (2). In Article 1, paragraph 26 of the Law of the Republic of Indonesia Number 32 of 2009 concerning Environmental Protection and Management, it is stated that "Environmental impact is the influence of changes in the environment caused by a business and/or activity"(3).

Urban drainage planning cannot be separated from land use, the master plan of the drainage system, and the socio-cultural conditions of the community. Planning a drainage system is often considered an easy job, but in reality, planning a drainage system in a city is a complicated job that requires a lot of money, energy, and time. In some cases of solving the problem of flooding or inundation in a city, community participation has a very important meaning in maintaining the existing drainage network (3).

Existing drainage systems, built during colonial times, were not designed to handle large volumes of water and were often clogged by garbage and sedimentation, thus impeding the flow of water. The first significant flood event was recorded in the 1970s, and

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since then, flooding has become a recurring problem. Major events in 2017 and 2023 submerged thousands of homes and residents (4).

Flood management is a series of efforts made to prevent, reduce, and deal with the impact of floods that can threaten human safety, damage the environment, and disrupt social and economic activities. Flooding itself is a natural phenomenon that occurs when the volume of water exceeds the capacity of rivers, drainage channels, or infiltration areas, so that water overflows to the land and causes inundation. The factors that cause floods are very diverse, ranging from high rainfall, poor drainage systems, deforestation, unplanned urbanization, to climate change (5).

In addition to prevention efforts, flood management also includes mitigation measures and emergency handling when floods occur. Mitigation is carried out to reduce the risks and impacts caused by floods, such as by increasing community capacity to deal with disasters through education, emergency response training, and the development of an effective early warning system (6).

Flood management protects the community from risks and impacts that can damage infrastructure and threaten life safety. These efforts also focus on reducing economic losses caused by floods, such as property damage and loss of income (6).

Regarding disaster mitigation and response, legal policies also regulate evacuation procedures, emergency assistance mechanisms, and post-flood recovery to minimize the impact of disasters. Applying strict law and synergy between the government and the community. It is hoped that Cirebon City can be better prepared to face the threat of floods in the future (7).

The problems are as follows: What efforts are made by relevant agencies in drainage management, and what are the implementation challenges in ensuring the effectiveness of the regulations?

2. Methods

In the juridical analysis of flood management in Cirebon City in the context of drainage management, Qualitative research methods will be used to gain a deep understanding of the problems faced.

This research will use a Normative Juridical approach, which aims to assess and understand the implementation of a flood management and drainage management regulation in Cirebon City. This approach is focused on analyzing laws and regulations related to flood management and drainage management, such as Laws, Government Regulations, and Cirebon City Regional Regulations.

In-Depth Interviews: I interviewed various stakeholders, such as Local government officials and people living in flood-prone areas.

3. Results and Discussion

3.1. Flood

Various factors, both natural and man-made, can cause floods. Natural factors include high rainfall that exceeds the absorption capacity of soil and river flows, sea tides that result in flash flooding, and the topography of an area in lowlands or basins that are easily inundated (8). Meanwhile, anthropogenic factors, or due to human activities, also play a significant role in exacerbating floods, such as deforestation that reduces soil absorption of rainwater, unplanned urbanization, so that many water catchment areas turn into

settlements and industrial areas, and poor drainage systems due to sedimentation, garbage, or narrowing of waterways.

3.1.1. Flood Management in Cirebon

Legal certainty in flood management in Cirebon City is important in regulating policies and actions that local governments, communities, and the private sector must carry out. In addition to regulations, the legal approach also involves law enforcement to ensure that the community and the industrial sector in Cirebon City comply with the environmental policies that have been set.

Flood management is an important part of drainage management, especially in urban areas that are experiencing rapid development, such as Cirebon City. However, over time, the unplanned and rapidly expanding development growth has led to the narrowing of the river's flow, resulting in a drastic decrease in its flow capacity.

In the past, Cirebon City had a fairly extensive river network with flows that were able to accommodate the natural overflow of rainwater. However, in recent decades, there have been significant changes due to offensive infrastructure development, settlements, and economic activities. Many river flows have narrowed, siltation, and are covered by illegal buildings or sedimentation that continues to accumulate. This causes the carrying capacity and water flow to be greatly reduced. So that when it rains heavily, the water overflows and causes flooding in various parts of the city.

3.2. Drainage

Drainage is a system designed to drain or remove excess water from an area, be it rainwater, wastewater, or excess groundwater. Drainage systems have an important role in preventing waterlogging, flooding, and soil erosion that can damage infrastructure and disrupt human activities (9).

Effective drainage management requires coordination between the government, the community, and the private sector to ensure the system can function optimally. The government has a major role in the planning and supervising drainage infrastructure, including regulations on the construction of waterways, technical standards that must be met, and policies related to rainwater management. The community also plays an important role in maintaining the cleanliness of drainage channels by not littering garbage that can clog the water flow. In some major cities, sustainable drainage is beginning to be implemented by adopting environmentally friendly technologies, such as infiltration wells, biopores, and green open spaces that can help the absorption of rainwater naturally (8). Regulations on this matter aim to ensure that the existing drainage system can drain water effectively to prevent inundation and flooding.

There are several methods in flood management, including:

1. Infrastructure Planning and Development: Construct and repair drainage systems, such as waterways, retention ponds, and embankments.
2. Routine Maintenance: Perform regular maintenance and cleaning of drainage channels to prevent blockages.
3. Community Education: Providing information and training to the community on the importance of maintaining clean drainage and dealing with floods (10).

3.2.1. Regulation of Drainage Management

In Indonesia, regulations related to drainage management and flood management are regulated in various laws and regulations, such as laws such as Law No. 32 of 2009 concerning environmental protection and management, In addition, the Regulation of the Minister of Public Works and Public Housing (PUPR) No. 12 of 2014 concerning the Implementation of Urban Drainage Systems provides guidelines for local governments in designing effective drainage systems (1). This regulation includes the principles of sustainable drainage management, such as the development of eco-based drainage systems, the use of environmentally friendly technology, and cross-sector coordination in rainwater management.

Implementing this regulation requires cooperation between the government, the community, and the private sector in water and environmental management. Local governments have an important role in ensuring that drainage and flood control policies are correctly implemented through strict supervision of development permits, rehabilitating damaged drainage infrastructure, and providing green open space as water catchment areas (11).

One of the solutions implemented by the Cirebon City Public Works and Spatial Planning Office (DPUTR) to overcome this problem is to carry out regular drainage maintenance, especially removing sediment or mud that settles in waterways. This activity is carried out periodically in the normalization program of rivers and drainage channels. This sludge removal activity has proven to be effective in increasing the water flow capacity and accelerating its flow downstream. In addition, this activity also helps prevent blockages that can cause waterlogging in a short time. However, the challenge still exists, namely public awareness of the importance of maintaining the state of the environment, starting with not throwing garbage into the river and maintaining environmental cleanliness (Interview with Mr. Branantyo Suryo W., ST, MM.).

The Public Works and Spatial Planning Office (DPUTR) suggested that the Ministry of PUPR collaborate with the Ministry of Education and Culture (Kemendikbud) to create a curriculum on environmental maintenance. He says it must be used as a culture since elementary school (SD). The problem of flooding is not easily solved when people have bad habits and take waste for granted. Cooperation between *stakeholders* is also needed to solve the flood problem.

Conclusion

Based on the judicial analysis of flood management in drainage management in Cirebon City, it was found that although related regulations have been determined, their implementation has not been running optimally. Factors such as the lack of strict sanctions on uncontrolled development that causes river narrowing, community behavior that does not care about environmental cleanliness, and challenges of coordination between *stakeholders* are the main obstacles. Collaborative efforts are needed between the government and the community to increase the effectiveness of drainage management to minimize flood risk.

Conflicts of Interest

"The authors declare no conflict of interest."

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