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The Roles of The Office of Public Works and Spatial Planning (PUPR) in Flood Prevention Program in Bengkulu City, Bengkulu Province

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ABSTRAK

Kondisi geografis yang dimiliki Kota Bengkulu menjadikannya sebagai salah satu daerah rawan bencana alam yang diakibatkan oleh iklim, cuaca atau faktor alamiah. Bencana alam yang terjadi juga disebabkan oleh faktor non alamiah yang dilakukan oleh manusia, sebagai contoh adalah banjir. Banjir di kota Bengkulu ditangani oleh Dinas Pekerjaan Umum dan Penataan Ruang (PUPR) sebagai salah satu pelaksana pelayanan dasar dan penyelenggara urusan pemerintahan daerah Kabupaten/Kota sebagaimana amanah Undang-Undang Nomor 23 Tahun 2014 tentang Pemerintahan Daerah. Pada tahun 2020, capaian persentase realisasi penanganan drainase kondisi baik, rasionya melebihi dari persentase target capaian. Namun, banjir masih saja terjadi pada beberapa titik lokasi di Kota Bengkulu. Penelitian ini bertujuan untuk mengetahui peranan Dinas PUPR dalam mencegah terjadinya banjir berulang di Kota Bengkulu. Metode penelitian yang digunakan adalah desain kualitatif deskriptif dengan pendekatan induktif. Teknik pengumpulan data menggunakan wawancara, observasi, dan dokumentasi. Infoman ditentukan dengan teknik *purposive and snowball sampling*. Analisis data dilakukan dengan cara reduksi data, penyajian data dan penarikan kesimpulan dengan menguji keabsahan data menggunakan triangulasi data. Hasil penelitian menunjukkan bahwa Peranan Dinas PUPR dalam mencegah terjadinya banjir berpedoman pada peraturan tertulis yang tertera dalam Peraturan Walikota Bengkulu Nomor 56 Tahun 2016 tentang Uraian dan Fungsi Dinas Daerah Kota Bengkulu dengan hasil sudah berjalan cukup baik namun belum optimal. Hal tersebut disebabkan oleh masih adanya beberapa kendala dilapangan seperti kurangnya kualitas dan kuantitas SDM pelaksana teknis operasional, rusaknya alat berat yang dimiliki, defisit anggaran, belum adanya *masterplan* pembangunan drainase, masalah pengelolaan limbah sampah serta pembangunan yang tidak terencana.

Kata Kunci : Peranan, Pencegahan, Banjir

ABSTRACT

Bengkulu City is situated in a geographical location that makes it susceptible to various natural disasters caused by climate, weather, and other natural factors. Human activities, such as the mismanagement of drainage systems, contribute to the occurrence of floods in the city. The responsibility for addressing these floods falls upon the Public Works and Spatial Planning Service (PUPR), which is tasked with providing basic services and managing regional government affairs in accordance with Law Number 23 of 2014 concerning Regional Government. While

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PUPR has achieved a percentage of its drainage maintenance targets in 2020, flooding continues to affect certain areas of Bengkulu City. Hence, this study aims to investigate the role of PUPR Service in preventing recurrent flooding in the city. A descriptive qualitative design with an inductive approach was employed for the research, utilizing interviews, observation, and documentation as data collection techniques. The selection of informants was based on purposive and snowball sampling techniques. Data analysis involved data reduction, presentation, and drawing conclusions through data triangulation to ensure validity. The study findings reveal that PUPR Service's role in flood prevention is guided by the Bengkulu Mayor Regulation Number 56 of 2016, which outlines the functions and responsibilities of Bengkulu City Regional Offices. While the results have been somewhat satisfactory, they are not yet optimal due to several obstacles in the field. These challenges include a shortage of skilled personnel, damaged equipment, budget deficits, a lack of a comprehensive drainage development plan, waste management issues, and uncontrolled urbanization.

Keywords: *Role, Prevention, Flood*

Introduction

Disasters are unfortunately a common occurrence in Indonesia and are often experienced by its people. The country's geographical location, situated at the convergence of three major tectonic plates—the Eurasian plate in the North, the Indo-Australian plate in the South, and the Pacific plate in the East—renders it susceptible to various natural disasters, including volcanic eruptions, earthquakes, tsunamis, etc (Setiawan et al. 2020).

Furthermore, Indonesia is also at risk of experiencing man-made disasters due to various activities that pose a threat to the environment. These activities include deforestation, forest fires, industrial accidents, and floods, among others (Setiawan et al. 2020). Moreover, human activities and rapid development have been steadily increasing, leading to a growing demand for land (Bambang 2009). This increased demand for land, driven by economic and residential needs, has resulted in a decline in the natural functions of water retention and absorption during the rainy season (Suripin 2004). Areas that were once capable of absorbing and retaining water have been transformed into impermeable surfaces, causing an accumulation of surface water and reduced water infiltration into the soil during the rainy season (Bambang 2009).

While development activities are intended to enhance human well-being, particularly in addressing housing needs, the continuous pursuit of development without considering its negative impacts can ultimately be detrimental to humans themselves (Angrelia et al. 2020). The loss of land that was once responsible for absorbing and regulating water discharge contributes to the occurrence of floods. Several factors contribute to flood disasters, including improper waste management, erosion and sedimentation, changes in land use, the presence of slum areas along rivers, high rainfall, inadequate flood control systems, tidal influences, river physiography,

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insufficient river capacity, land subsidence, and damage to flood control structures (Kodoatie and Sjarief 2006). Between 2000 and 2011 alone, approximately 77% of the national disasters recorded were hydrometeorological in nature, encompassing events such as tornadoes, landslides, and floods (Rosyidie 2013).

Flood disasters rank as the third most economically damaging natural disaster globally. These events can strike at any time and often lead to the loss of property and lives. Floods can cause extensive damage to buildings and result in the loss of valuable possessions. Moreover, they can disrupt daily routines, preventing individuals from attending school or work (Findayani 2015).

According to the definition provided by the Big Indonesian Dictionary (KBBI), flooding refers to the submersion of previously dry land due to an increase in water volume (Setiawan et al. 2020). From an ecological perspective, flooding is considered a physical event that takes place in the environment where humans reside (Mukhtar et al. 2020). Floods occur when the ground becomes inundated as a result of rivers overflowing due to water inflows from higher altitude areas or due to heavy rainfall (Findayani 2015). Floods are a form of environmental pollution caused by the disruption of human ecosystems through direct and indirect human activities. The relationship between floods and humans is closely intertwined, as human actions can contribute to the occurrence of floods, and when floods do occur, they significantly impact human life. Hence, maintaining a balance between development activities and environmental preservation is crucial for human well-being (Angrelia et al. 2020), considering that the environment can serve as both a resource and a hazard (Rosyidie 2013).

Bengkulu Province, located in the western part of Indonesia, directly faces the Indonesian Ocean. It is characterized by relatively narrow plains and a coastline stretching 525 km (Citra et al. 2022). Such geographical conditions make Bengkulu Province prone to various natural disasters caused by climate and weather, including landslides, tornadoes, severe weather, droughts, floods, and others (Hadi, A.I., Suwarsono. 2010). The climate in Bengkulu City is significantly influenced by the Indian Ocean. When low pressure occurs in the Indian Ocean, Bengkulu City experiences heavy rainfall accompanied by storms and lightning (Akbar, as cited in Citra et al. 2022). Moreover, Citra et al. (2022)noted that Bengkulu City experiences a high average intensity of rainfall. For instance, on August 21, 2005, the recorded rainfall reached 143 mm, and on August 28, 1996, based on records from the Baai Island Climatology Station in Bengkulu, there was heavy rainfall of 151 mm. The average annual rainfall rate in 2020 was recorded as 358 mm (Citra et al. 2022).

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Bengkulu City, situated in the coastal area, experiences an average maximum air temperature ranging from 29°C to 30°C, while the minimum temperature hovers around 23°C each month. The humidity levels in the city range between 81% and 91%. The monthly rainfall in Bengkulu City varies from 200 mm to 600 mm, and there are approximately 10 to 21 rainy days each month. The climate classification of Bengkulu City falls under climate type A (Wet Tropics), with 10 wet months spanning from October to July. The period from December to January is when heavy rainfall is expected (Bengkulu 2023).

The high rainfall in Bengkulu City is a natural factor that contributes to flooding. However, there are also non-natural factors that exacerbate the situation, such as inadequate drainage systems, limited river capacity, blockages in waterways, deforestation, and industrial waste, among others. The Upper River Areas (DUS) experience forest damage due to deforestation and mining, while the Downstream Areas (DIS) face significant sedimentation issues caused by siltation. The accumulation of waste further worsens the situation, as the rivers are unable to handle the rapid flow of water. The specific locations of flood points in Bengkulu City are presented in Table 1.

Table 1. Flood Points in Bengkulu City in 2020

No	District	Location
1.	Gading Cempaka	• Cempaka Permai – Rupat River • Lingkar Barat
2.	Sungai Serut	• Tanjung Agung • Tanjung Jaya • Bengkulu Market
3.	Muara Bangkahulu	• Rawa Makmur • Pinang Mas
4.	Ratu Ramban	• Penurunan • Sawah Lebar

Source: BPBP of Bengkulu City, 2020

Table 1 shows 9 flood locations that occurred in 4 sub-districts in Bengkulu City. The Provincial and Regency/City Governments have assigned the *Pekerjaan Umum dan Pembangunan Rakyat* (PUPR) or Public Works and Spatial Planning Office to address and find a solution for flooding which is still an annual problem in every rainy season or high tide.

The Office of Public Works and Spatial Planning (PUPR) is mandated by Law Number 23 of 2014 concerning Regional Government to execute mandatory government affairs, providing basic services and administering regional government affairs at the provincial and regency/city

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levels. Table 2 presents the target achievement and actual performance of PUPR Service in Bengkulu City in terms of drainage handling.

Table 2. Target Achievements and the Performance of PUPR of Bengkulu City in 2019

No	Strategic Goal	Performance Indicator	Realization	Percentage
1.	Improved Road Connectivity and Quality	Percentage of Roads with Good Conditio	71	100
2.	Improved basic infrastructure	1. Ratio of Clean Water Supply	12	114
		2. Ratio of access to good sanitary	88	100
		3. Ratio of Drainage in good condition	70	116
		4. Ratio of roads in good condition	28	100
3.	Improvement In Government-Owned Building With Certification	Percentage Of Certified Buildings	0	0

Source : PUPR Office of Bengkulu City, 2020

Table 2 illustrates that Bengkulu City PUPR Service is responsible for assisting in flood management, specifically in terms of drainage handling. The table reveals that the drainage condition is satisfactory, with the actual handling percentage surpassing the target achievement percentage. The organizational structure of Bengkulu City Public Works and Spatial Planning Service, as outlined in the Bengkulu Mayor Regulation Number 56 of 2016, includes the Water Resources sector, which encompasses irrigation and swamp sections, drainage and flood control sections, as well as operations and maintenance sections. This regulation grants Bengkulu City government, through PUPR Office, the authority to address flooding issues in the city. PUPR Service has undertaken development initiatives to mitigate flooding, including the construction of drainage systems at 17 locations, Box Culverts at 34 locations, normalization of drainage, desilting, and the establishment of reservoirs at flood-prone areas (Bengkulu 2017). Nevertheless, flooding remains an unresolved issue in Bengkulu City.

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This study aims to examine the role of the Office of Public Works and Spatial Planning (PUPR) in preventing flooding in Bengkulu City. Previous studies have provided valuable insights on similar topics. Azlan and Amin (2015) conducted a study titled "The Role of the Department of Highways and Water Resources in Handling Flood Problems in 2014 (Case Study of Graha Fauzan Asri Housing)." Their findings revealed that the occurrence of flooding in Graha Fauzan Asri Housing was attributed to narrowed and obstructed waterways and rivers, leading to suboptimal functionality. Khalik (2022) conducted research on the normalization of rivers for flood prevention by PUPR Service in Palembang City, South Sumatra Province. The study demonstrated that the Palembang City PUPR Service effectively played its role in flood prevention through cooperation with various stakeholders, emphasizing the importance of utilizing social media and information technology for outreach and collaboration (Suryadi 2020) investigated the role of the government in addressing floods in Samarinda City. The findings indicated that the government's role in managing natural disasters, including floods, was considered positive by the flood-affected community. The study highlighted the strong collaborative relationship between the government and the community, with active community involvement in disaster preparedness and response efforts.

Research Method

In this study, a descriptive qualitative design with an inductive approach was employed to examine flood prevention efforts carried out by PUPR Service in Bengkulu City, Bengkulu Province. Data collection techniques included interviews, observation, and documentation to gather relevant information. The selection of informants was based on purposive and snowball sampling techniques, involving key individuals such as the Head of Bengkulu City PUPR Service, the Head of the Water Resources Division, the Head of the Drainage and Flood Control Section, the Head of the Operation and Maintenance of Water Resources Section, members of the DPRD, and 5 community representatives. Data analysis encompassed data reduction, data presentation, and drawing conclusions, with the validity of the data tested using data triangulation. Sugiyono's (2017) triangulation technique was utilized, involving triangulation of sources, time, and data collection techniques, where interview data were cross-checked with observations and documentation. The role theory proposed by Thoha (2003) was employed as the analytical framework, with a focus on analyzing PUPR Service's role based on the written regulations outlined in Bengkulu Mayor Regulation Number 56 of 2016, which described the duties and functions of Bengkulu City Regional Office.

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Results and Discussions

Thoha (2003) explained that roles are derived from the description of a position, which is outlined in a written document specifying the responsibilities associated with a particular job. Therefore, in each position or task, there are corresponding responsibilities that need to be defined and established as targets for the roles and responsibilities of the Public Works and Spatial Planning Office.

The role of Bengkulu City PUPR Service is defined in Bengkulu Mayor Regulation Number 56 of 2016, which outlines the duties and functions of Bengkulu City Regional Service. The Public Works and Spatial Planning Service consists of various sections, each responsible for specific tasks based on their expertise. In relation to the flooding issues in Bengkulu City, the Water Resources Sector has been given the authority to address and find solutions. Two sections, namely the Drainage and Flood Control Section and the Operation and Maintenance Section of Water Power, play a significant role in preventing flooding in Bengkulu City, each with their own set of duties and functions.

a. Developing comprehensive plans, programs, and activities related to flood prevention.
b. Conducting technical planning activities to assess and address flood risks.
c. Studying and analyzing the relevant legislation and regulations pertaining to flood management.
d. Providing recommendations for effective flood management measures.
e. Implementing the approved activity programs aimed at flood prevention.
f. Conducting an inventory of areas that require specific flood control measures.
g. Conducting regular evaluation and monitoring of implemented activities to assess their effectiveness.
h. Facilitating coordination with other relevant work units and agencies involved in flood prevention efforts.
i. Preparing and submitting comprehensive reports on the implementation of assigned tasks.
j. Undertaking additional responsibilities and tasks as assigned by superiors to support flood prevention efforts.

A. Program Planning

The preparation of a work program in the water resources field follows a similar process as in other fields, serving as an initial stage in fulfilling the assigned role. This work program

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serves as a guide for the activities of the respective units in the coming years. The program is prepared with the aim of aligning the needs of the community, addressing the existing field problems, and supporting the regional development plans of Bengkulu City.

Thoha (2003) stated that every role involves specific tasks and responsibilities. The Drainage and Flood Control Section and the Operations and Maintenance Section of Water Resources within PUPR Office have defined tasks as stated in Bengkulu Mayor Regulation No. 56 of 2016, which outlines the duties and functions of Bengkulu City Regional Office. These tasks are aligned with the plans, programs, and activities implemented by PUPR Service to fulfill the responsibilities of flood prevention and water resource management. Detailed information regarding these plans, programs, and activities can be found in the corresponding documentation (See Table 3).

Table 3. Objectives and Targets of the Program of PUPR Office

Objectives	Targets	Target Indicators	Performance Target				
			2019	2020	2021	2022	**2023**
Improving The Quality Of Urban Infrastructure	Improved Basic Infrastructure Availability	1. The Percentage Of Population Served By A City-Scale Inundation-Free Drainage Network System	40%	40%	60%	80%	**100%**
		2. Length Of Drainage Built/ Improved	1.5 Km	10 Km	25 Km	40 Km	**50 Km**
		3. Length Of Drainage That Is Rehabilitated/ Maintained Regularly	**2.5 Km**	**2.7 Km**	**3 Km**	**2.5 Km**	**2.5 Km**

Source : RPJMD Kota Bengkulu, 2019

Table 3 presents the goals and objectives that Bengkulu City PUPR Service has aimed to achieve over the past 5 years. These objectives are pursued by two interconnected sections, namely the Drainage and Flood Control Section and the Operation and Maintenance Section of Water Resources. The formulation of these goals and objectives involved multiple stages and methods, including gathering input from the community through the self-management program, addressing concerns raised by Board Members regarding community grievances in their respective areas,

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conducting field surveys, and aligning with the vision, mission, and RPJMD (Regional Medium-Term Development Plan) established by Bengkulu City Government. However, it is important to note that there is currently no Operational Procedure System in place specifically addressing the activity planning process. Table 4 below provides an overview of the flood prevention measures planned through the researcher's self-management program.

Table 4. Community's Flood Prevention Program

No.	Location	Investigation Outcomes	Actions	Remarks
1.	Bengkulu Market	Channel capacity is insufficient Sedimentation and trash in the canal Tides	Normalization	1. Routine normalization of drainage channels from garbage and sedimentation (min. 3x 1 year) for better water flow. 2. The need for inspection of road to be passed by heavy vehicles for normalization.
2.	Decreases	Channel capacity is insufficient Sedimentation and trash in the canal Tides	Normalization	1. Regular normalization of drainage channels from garbage and sedimentation (min. 3x 1 year) for better water flow. 2. An inspection road to be passed by heavy vehicles for
3.	Pasar Minggu	Sedimentation and trash in the canal	Normalization	1. Routine normalization of drainage channels from garbage and sedimentation (min. 3x 1 year) for better water flow. 2. The need for inspection of road to be passed by heavy vehicles for normalization.
4.	Tanjung Agung	Channel capacity is insufficient Sedimentation and trash in the canal The presence of overflow of river water from the Bengkulu River The presence of a bridge with a shape that impedes the smooth flow of water in the channel Tides	Normalization and Construction	1. Normalization of Drainage channels from waste and Sedimentation 2. Construction of cast concrete by building river bank retainers so that the river does not experience abrasion 3. Changing the shape of the bridge without hindering the smooth flow of water in the canal

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5.	Rawa Makmur	Sedimentation and trash in the canal The drainage ditch is covered with bushes. Tides	Normalization	Special assessment through the feasibility study (FS) for handling floods (Master Plan) due to sea tides
6.	Sawah Lebar	Channel The front drainage of the shop complex is different in elevation and sedimentation Channel Drainage is not functioning normally Changes in land use due to land clearing	Renovation	1. Drainage rehabilitation 2. Optimizing sustainable catchment areas in drainage management 3. Enlarging the dimensions of the drains on the drainage

Source : PUPR, 2020

Table 4 presents a selection of flood prevention measures implemented by PUPR Office, utilizing the findings from the self-management program. The Community-Based Program is employed, incorporating investigative processes and field surveys. Three key actions are undertaken to prevent flooding, namely construction, normalization, and renovation. The self-management program serves as the forefront of PUPR Service's efforts in flood prevention. This comprehensive program involves various operational and maintenance sections, as the ultimate goal is the execution and management of the implemented measures.

B. Implementation of Program Technical Plans

The Technical planning of activities plays a vital role in the tasks and functions of the Public Works and Housing Agency in addressing floods. The program implementation is recorded in the work plan, which is documented through the Budget User Fund (DPA). From the DPA, an analysis of the identified issues is conducted to establish priority scales based on public complaints and field survey results. The coordination between the Drainage and Flood Control Section and the Operations and Maintenance Section of Water Resources provides valuable information that influences the programs and policies formulated by Bengkulu City Public Works and Spatial Planning Office. It is worth noting that the researchers discovered that not all instances of water accumulation in Bengkulu City are categorized as floods; some are classified as inundations. However, it is common for ordinary people to refer to inundations as floods.

C. Reviewing the Relevant Laws and Regulations

In the performance of their duties and responsibilities, public service agencies are bound by regulations. These regulations include laws and regulations issued by both the central

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government and regional governments, which must be adhered to in carrying out their duties as civil servants. PUPR Service, as a government office entrusted with the management of regional affairs, is obligated to comply with these regulations. This obligation is in line with Article 12, paragraph 1 of Law Number 23 of 2014 concerning Regional Government, which outlines the responsibilities and functions of government agencies in managing regional affairs.

In addition to general regulations governing regional government affairs, PUPR Service is also guided by specific regulations that pertain to drainage. One such regulation is the Regulation of the Minister of Public Works Number 12/PRT/M/2014, which provides guidelines for the implementation of urban drainage systems. This regulation serves as a reference for PUPR Service in managing and maintaining drainage systems in urban areas.

D. Proposing Recommendations for Flood Management Program

Based on the research findings, the Public Works and Spatial Planning Office of Bengkulu City has implemented various measures to manage and prevent flooding. These efforts include the construction of drainage systems, normalization of existing drainage systems, building reservoirs, and active maintenance of water channels. These actions aim to address flood-prone areas in Bengkulu City, as outlined in the drainage system development plan presented in table 5.

Table 5. Drainage System Development Plan

No.	Drainage Network
1.	Development of drainage infrastructure by way of channel normalization, channel rehabilitation, addition of new channels and construction of supporting drainage infrastructure.
2.	Making separate drainage in functional areas connected to primary canals without channel load in residential areas
3.	Optimizing the absorption of water into the soil to reduce the load on drainage channels by reforestation and making infiltration wells
4.	Coordination of drainage channel management, especially in permanent drainage channels in urban areas

Source : Strategies based on RT/RW of Bengkulu City, 2019

Table 5 highlights the activity plans made by the Public Works and Spatial Planning Office of Bengkulu City, representing the regional government's commitment to developing an effective drainage system as part of their flood management efforts. These plans serve as the foundation for

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implementing specific activities aimed at improving the drainage system and mitigating the risk of floods in the region.

E. Executing the Program

1) **Drainage and Flood Management**

One cause of flooding is malfunctioning drainage infrastructure. Consequently, efforts to address this issue typically involve physical development or rehabilitation of the drainage system. The responsibility for carrying out such activities falls upon the Drainage and Flood Control Section. This section is primarily tasked with the rehabilitation, upgrading, construction, and development of drainage following the initial stages, which include preparing work programs, planning activities, and recommending appropriate measures. Table 6 below presents the activities undertaken by the Water Resources Sector of PUPR Service in this regard.

Table 6. Drainage of SDA in 2019

No. (1)	Program Drainage (2)	Number (3)
1	Deputy drainage improvement/ rehabilitation Payung Negara VII behind the Pagar Dewa Gas Station	**151,000,000,-**
2	Improvement/ rehabilitation of drainage area of Danau 14 Street	**91,000,000,-**
3	Improvement/ rehabilitation of drainage area of Padat Karya 2 near 3 next to masjid Lebar District	**114,000,000,-**
4	Improvement/rehabilitation of drainage area of Terminal regional perum griya pelangi RT.25/RW01 kel.pekan sabtu	**151,000,000,-**
5	Drainage improvement/rehabilitation puskesmas ratu agung kel.bentiring permai RT 21	**151,000,000,-**
6	Drainage improvement/rehabilitation at Sumur Dewa Village RT 1	**151.000.000,-**
7	Drainage improvement/rehabilitation in Pekan Sabtu Area RT 13 and RT 15	**151,000,000,-**
8	Drainage improvement/rehabilitation around UNIB Permai Area IV D RT 15/RW 04 Bentiting Permai	**151,000,000,-**
9	Improvement/Rehabilitation of drainage of Lempung Area RT.03	**151,000,000,-**
10	Improvement/Rehabilitation of drainage of Surabaya Permai RT 9	**151,000,000,-**
11	Improvement/Rehabilitation of drainage of RT.06/RW.02 kec. Ratu Samban	**151,000,000,-**
12	Improvement/Rehabilitation of drainage around Mahakam Street behind Raflesia Residence	**151.000.000,-**
13	Improvement/Rehabilitation of drainage of Kapuas 4c RT.06 RW 02 Lingkar Barat	**151.000.000,-**

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14	Improvement/Rehabilitation of drainage of Penurunan RT.18 RT.18 . Ratu Agung District	**151,000,000,-**
15	Improvement/Rehabilitation of drainage area of Akasia Pagar Dewa Street	**151,000,000,-**
16	Improvement/Rehabilitation of drainage area RT. 21 Bentiting Permai	**151,000,000,-**
17	Improvement/Rehabilitation of drainage around SMP 22 Bengkulu City	**151,000,000,-**
18	Improvement/Rehabilitation of drainage area RT.15 Sumur Dewa Village	**151,000,000,-**
19	Improvement/Rehabilitation of drainage area RT.27 Sumur dewa	**151.000. 000,-**

Source: *LAKIP Dinas Pekerjaan Umum*, 2020

Table 6 provides insight into the activities carried out by the Water Resources Sector of Bengkulu City PUPR Service. It highlights that the sector undertook improvement and rehabilitation projects for drainage systems in 19 areas prone to flooding. The previous temporary trenches were replaced with permanent drainage channels to enhance effectiveness. Furthermore, development initiatives concentrated on resolving blockages caused by sedimentation through the normalization process.

2) **Maintenance of Operational Activities and Water Resource**

According to Bengkulu Mayor Regulation No. 56, the Water Resources Operations and Maintenance Section is responsible for several crucial tasks related to flood mitigation in the community environment. These tasks include providing guidance on the utilization of drainage systems, supervising existing drainages, and conducting necessary repairs on drainage networks and other associated structures. By fulfilling these duties, the section aims to address flood problems effectively.

The provision of guidance and supervision is a subsequent effort following the implementation of water resources network development. This action plays a crucial role in ensuring the long-term sustainability of the implemented work program. The outcomes of the program can take the form of physical infrastructure or community outreach initiatives aimed at preventing flood problems.

Field research findings indicate that guidance and supervision are conducted on the community during the 180-day maintenance period by PUPR Service, involving contractors as well. During this period, the community is encouraged to actively participate in the care, maintenance, and upkeep of essential physical structures for flood prevention, such as ditches, drainages, culverts, and infiltration wells. This can be achieved by refraining from littering and fostering a spirit of mutual cooperation. However, there are

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instances when the Water Resources Operations and Maintenance Section must work independently without coordination with the local community, particularly during sudden issues such as stagnant water or flooding caused by blockages resulting from garbage accumulation upstream. In such cases, immediate action is necessary to address the problem effectively.

F. Inventory of Locations Requiring Flood Management

To establish an inventory of areas requiring control, the Public Works Office collaborates with relevant stakeholders responsible for collecting data on flood-prone regions. This inventory process is conducted periodically, aiming to monitor and proactively address potential flooding in these vulnerable areas, particularly in anticipation of the rainy season.

According to the findings presented in Table 1 by previous researchers, there are a total of 9 flood-prone locations distributed across 4 sub-districts in Bengkulu City. These areas have garnered increased attention and control in terms of flood management by PUPR Service, particularly within the Water Resources Sector. Handling and controlling floods in these areas have become routine tasks and responsibilities for the Water Resources Sector, especially during the onset of the rainy season. The division is entrusted with the responsibility of proactively addressing and managing potential flooding risks in these flood-prone areas to prevent them from experiencing the same consequences as in previous incidents.

G. Carrying Out Evaluation and Monitoring of the Program Implementation

Within the realm of water resources, one of the responsibilities of the Office of Public Works and Spatial Planning is to conduct evaluations and monitoring of activity implementation. This task is specifically outlined as a duty of the Drainage and Maintenance Operations Section in the Water Resources Sector of Bengkulu City Public Works and Spatial Planning Office. Based on research findings, the Water Resources Sector typically engages with local RT/RW (neighborhood/community unit) representatives. They inquire about any observed changes resulting from the implemented efforts in the respective areas. The sector also seeks information on any significant incidents that require attention, ensuring that the community's concerns are addressed. Most of the people in these areas felt greatly assisted by these initiatives.

Based on the results of the study it was also found that monitoring activities were carried out as direct supervision of flood points that had been handled. This activity aims to ensure that the function of the drainage remains optimal and prevents damage or problems that are not monitored. The community is also the strongest element in carrying out supervisory functions over

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drainage objects because of a sense of ownership of the drainage being built. Besides that, monitoring activities also open opportunities for criticism and suggestions so that the services carried out can be even more optimal in the future. For example, related to ineffective tools or workmanship, criticism and suggestions are very supportive to improve performance in carrying out the role of PUPR Service.

H. Conducting Coordination with other Work Units/Institutions

Coordination is an essential aspect of facilitating the work of each field and section in Bengkulu City PUPR Service. In preparing materials, coordination is done both internally and externally to prevent misunderstandings and unfavorable working relationships between each line within the agency. The Drainage and Flood Control Section in the Water Resources Sector is responsible for preparing coordination materials with related work units/ agencies

The coordination involved several other stakeholders, including the Environment Service, District Heads, Village Heads, and property development parties. For instance, when PUPR Service expects to build a drainage, a coordination needs to be established with *Dinas Lingkungan Hidup* (DLH) or Department of the Environment to determine the width of the drainage and riparian.

I. Presenting the Program Implementation Report

Program implementation report is a crucial part of program implementation process. The report presents information to superiors and it shows the evaluation of the implementation which can be further used as the reference for determining future activities. The report of flood control has been submitted to the Head of PUPR Service to be later used as references in the future.

J. Carrying Out other Duties as Assigned

Based on the results of the study, the assignment of other tasks given by superiors is a task outside the main tasks and functions of this section. Other orders given by the Head of Service are only within the scope of being an agency representative at a meeting, not to decide or provide policy. The assignment is to become a representative for coordination meetings at BAPPEDA or between OPDs. The individual appointed to represent the meeting is of course an individual who is considered competent and has the ability to properly convey matters that need to be explained at the meeting. Therefore, the role of these sections must be carried out even outside of the main tasks and functions of each as a form of professionalism and loyalty to the leaders.

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The role of the Public Works and Spatial Planning Office in the context of preventing flooding in Bengkulu City should be supported by internal factors that include reliable tools, expert human resources, and adequate budget. External supports are also necessary that include positive cooperation and support from all parties in addressing flood problems.

Equipment plays a vital role in facilitating the execution of physical tasks in the field. In this context, the Public Works, and Spatial Planning (PUPR) Service possesses a mini excavator and an amphibious tractor, specifically designed for challenging terrains. Unfortunately, these tools have been in a state of disrepair for an extended period and are currently inoperable. The cost of repairing and replacing them is substantial, which is why manual labor, relying on human resources, continues to be employed during flood incidents.

The human resources involved in the activities of the Public Works and Public Housing Agency would benefit from enhanced operational technical capabilities through education and training. Currently, they often seek assistance from external parties or other work units when dealing with technical matters in the field. The limited number of personnel also hampers the service performance of Bengkulu City PUPR Service. The Water Resources Sector faces the challenge of controlling extensive flood problems in Bengkulu City with only 10 staff members.

The budgetary constraints significantly impact the role of PUPR Service in flood prevention efforts in Bengkulu City. In recent times, the allocated budget for addressing flood problems has been diminishing due to deficits. Moreover, specific central allocation funds (DAK) have not been allocated towards flood-related issues. Consequently, the government of Bengkulu City has prioritized utilizing the available funds for storing raw water and improving sanitation, given the limited financial resources.

The drainage master plan serves as a crucial reference for urban planning, particularly in the development of drainage systems. It should be prepared and issued by BAPPEDA (Regional Development Planning Agency) with a long-term perspective to prevent land use conflicts. However, the absence of a well-developed drainage master plan has led to increasingly chaotic drainage conditions in Bengkulu City, with numerous drainage boundaries being encroached upon by buildings. As a result, water does not flow as intended, leading to road inundation. This problem has become complex because demolishing the encroaching structures would require significant compensation, while the budget allocated for flood-related issues is limited.

In addition to the challenges, poor waste management significantly hampers the role of PUPR Service in flood prevention. The issue stems from the imbalance between population growth

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and effective waste management practices. Certain areas in Bengkulu City, such as Bengkulu Market, Decline, Sunday Market, Tanjung Agung, Rawa Makmur, and Sawah Lebar, continue to experience flooding due to the cultural habit of disposing of garbage into drainage canals, leading to blockages. Moreover, the absence of a well-defined drainage development master plan contributes to unplanned development. Private sector or contractor-led land development for housing purposes often results in sedimentation or leftover dredged materials during land clearing, further exacerbating the risk of flooding.

Conclusions

The role of PUPR Service in flood prevention is governed by Bengkulu Mayor Regulation Number 56 of 2016, which outlines the functions and responsibilities of Bengkulu City Regional Office. Within PUPR Service, the Water Resources Sector is responsible for flood control and consists of two sections: the Drainage and Flood Control Section, as well as the Water Resources Operation and Maintenance Section. While the results of flood prevention efforts have been satisfactory, they have not reached their full potential. The Water Resources Sector of Bengkulu City PUPR Service has effectively implemented drainage improvement and rehabilitation projects at 19 flood-prone locations. This includes replacing temporary ditches with permanent drainage channels and addressing blocked drains due to sedimentation through normalization efforts. However, several challenges hinder the optimal performance of flood prevention initiatives by PUPR Office of Bengkulu City. These challenges include a shortage of qualified and sufficient human resources for technical operations, equipment damage, budget deficits, the absence of a comprehensive drainage development master plan, waste management issues, and unplanned constructions.

PUPR Service has performed its duties in preventing flooding in Bengkulu City. However, improvement can be made by applying these proposed recommendations.

1) The expeditious development of a comprehensive drainage master plan is crucial to bring better organization to urban planning in Bengkulu City, specifically regarding its drainage system.
2) It is necessary to enhance both the quality and quantity of operational technical staff by providing opportunities for education, training, seminars, workshops, and technical guidance related to flood disaster management and prevention. Recruiting new

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employees or temporarily assigning operational technical personnel can bolster the workforce at PUPR Office.

3) Increasing the allocation for the flood prevention budget in the upcoming fiscal year is essential. This will enable the repair or replacement of damaged heavy equipment and optimize flood prevention efforts in Bengkulu City.
4) Bengkulu City Government should formulate effective policies concerning waste management to contribute to flood prevention in the city.
5) Implementing stringent policies and sanctions for development actors who disregard the Environmental Impact Analysis in Bengkulu City is necessary to ensure responsible and sustainable development practices.

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