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# Jayapura Regency Government's Strategy in Flood Disaster Management in Sentani District

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**KEYWORDS**
Strategy; Disaster Management; Flood

**ABSTRACT**
Sentani District in Jayapura Regency often faces floods that have a significant impact on people's lives, infrastructure, and the environment. High rainfall intensity, geographical conditions, and suboptimal spatial management are the main factors causing flooding in this region. The floods that occurred not only damaged people's homes, but also disrupted economic and social activities, and caused huge losses to the community and local government. The aim of this research is to analyze and formulate appropriate strategies to be used by the Jayapura Regency Government in managing flood disasters, especially in the Sentani District, in order to find out appropriate steps that can be implemented in resolving the problems of flood disasters that frequently occur. The research method used is descriptive qualitative through an inductive approach. Apart from that, the author's data sources are people, places, and documents, with data collection techniques using interviews, observation, and documentation. The theory used by researchers is strategic theory using SOAR analysis. This research produced 5 (five) strategies for flood management. By implementing the right strategy and good collaboration between stakeholders, it is hoped that it can reduce the risk and impact of flood disasters and increase community resilience in facing these disasters.



## 1. Introduction

Indonesia has been independent for 78 years. However, various events, such as politics, security, natural disasters, and so on, have tested the unity of the nation. This country is located on the equator with diverse natural conditions, but certain areas have geographical, geological, and demographic conditions that are vulnerable to the occurrence of a disaster with the risk of damage

and loss, so it requires good coordination of handling and prevention systematically and integrated. Various disasters can occur in all corners of Indonesia, be they natural or non-natural disasters or social disasters (Supriyadi et al., 2018; Venelia et al., 2021).

There needs to be a strategy to deal with various disasters that occur through strategic policies and programs (Chandler Jr, 1969). Policies that have been implemented by the government and authorities, as well as the role of the Indonesian people and nation regarding disasters to overcome disasters, are still very lacking (Awalia et al., 2015; Setyorini, 2023).

This is evident from several disasters that occurred in Indonesia often caused various impacts. This shows that disaster management strategies, both from the government and the community, have not been implemented optimally. The following is presented a graph of flood disasters that occurred in Indonesia.

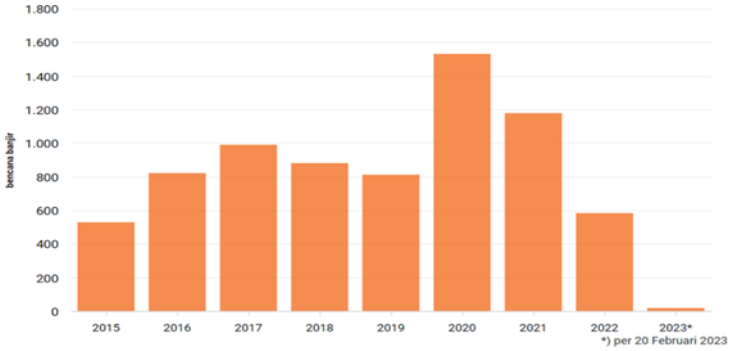


**Figure 1 Indonesia Disaster Information Data**

Source: DIBI-BNPB

Based on information obtained from the Indonesian Disaster Information Data (DIBI)-BNPB, floods often occur in Indonesia. Flooding can occur due to high-intensity rain and is not adequately offset by soil uptake. Although flood data has decreased in the last 3 years, it is still a concern to complete maximum flood disaster management. Climate change that occurs also has an influence on the incidence of hydrometeorological disasters that increase. With a large number of events, there is a huge impact on the environmental and economic sectors of the disaster group, both directly and indirectly.

Human activities also affect environmental conditions, such as settlement development and forest encroachment for industrial activities, which certainly damage the ecosystem and ecology in the area (Himshikha et al., 2022).

Floods are one example of natural disasters that commonly occur in various parts of Indonesia. According to (Raharjo, 2009) flooding is the result of excessive rain and cannot be absorbed by the soil. This natural phenomenon often occurs in Indonesia and causes huge material losses to the victims. A flood is an event when water inundates land that is usually dry, or that inundates normal water limits. According to the legal provisions in Law Regulation Number 24 of 2007, disaster management includes a series of steps involving the establishment of policies related to disaster risk development, disaster prevention activities, emergency response, and rehabilitation processes.

Disaster management must be done with careful planning, coordinated implementation, and comprehensive evaluation (F. R. David, 2013). Disaster management aims to protect residents from the threat of danger and provide a sense of security, which is in line with the vision and mission of the government in accordance with applicable law and build a sense of solidarity among others for an attitude of care, empathy, and cooperation for a safe, peaceful and prosperous environment.

Sentani District is a district that has an area of 79.8 km2 and a population of 52,378 inhabitants. This district is located in the city center of Jayapura Regency which is surrounded by Mount Cycloop and Lake Sentani, so the area is very strategic and prone to disasters.

As for the flood disaster data in Sentani District, it can be seen in the table presented below:

**Table 1 Flood Disaster Data in Sentani District 2018-2022**

| NO | Types of Disasters | Location and time | Disaster Victims/Impacts | | | |
|---|---|---|---|---|---|---|
| | | | Soul | Infrastructure | Settlement | Other |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 1 | Flood | Distrik Sentani (2018) | | Submerged roads | 2 housing units | |
| 2 | Flood | BTN Gajah Mada, BTN Sosial, Jalan Raya Kemiri Distrik Sentani (6 Januari 2019) | | | ± 302 submerged housing units in BTN Gajah Mada, ± 14 units, BTN Pool 3 Landslide Prone Unit | |
| 3 | Lake Water Overflows | Lake Sentani (2019) | Refugee Independent (163 households) | Damaged pier 21units | Submerged house 16 families | Fisheries fail to harvest |
| 4 | Flash Floods | Kabupaten Jayapura (Maret 2019) | 106 MD 17 Lost 153 LB 801 LR 7.617 Refugee | Heavily damaged road (22,302 m) Medium-damaged road (4,000 m) Heavily damaged aircraft (1 unit) Damaged water network (13,120m) Water intake 4 units Broken water installation | Market damaged 90 plots District office 1 unit Subdistrict office 2 units School building | Farm failure Pigsty damage |
| 5 | Flood | Distrik Sentani (23 Desember 2020) | | | Submerged residential areas | Submerged sago hamlet |

| | | | | |
|---|---|---|---|---|
| 6 | Flood | BTN Gajah Mada, BTN Sosial, Jln Raya Kemiri Distrik Sentani (2020) | | Several housing units were submerged |
| 7 | Floods and Landslides | Kampung Sereh Distrik Sentani (2021) | | |
| 8 | Flood | Kampung Maribu Distrik Sentani (2021) | Submerged access road | 40 Housing Units Inundated |
| 9 | Flood | Kampung Yahim Distrik Sentani (7 Januari 2022) | | People's homes were flooded |
| 10 | Flood | Kelurahan Hinekombe (7 Januari 2022) | Resulting in erosion | 1 Church building unit |
| 11 | Flood | Kampu Kehiran II (2022) | | People's homes submerged |
| 12 | Flood | BTN Permata Hijau (2022) | | Residents' houses were submerged as many as 41 units/KK (141 people), and household appliances were also submerged |

Source: Processed by researchers, 2023

Based on data from BPBD Jayapura Regency in the last 5 years, there have been various floods that occurred in Sentani District, which resulted in various impacts on both property and lives. Sentani district has 12 rivers that are prone to overflowing due to water deliveries from the Cycloop Nature Reserve during heavy rainfall. Previously, on March 16, 2019, there was a major flash flood disaster in the Sentani area, the capital city of Jayapura, and surrounding areas due to the overflow of a number of rivers after heavy rain for several hours.

The largest total loss due to flash floods occurred in 2019, reaching Rp 506 billion with a death toll of 106 people. BPBD of Jayapura Regency reported that several facilities and infrastructure were flooded, such as housing units, churches and Lukas Enembe Stadium, and caused landslides in several

areas in Sentani District. The locations affected by flooding spread in several areas in Sentani District. Reviewing this, the government moved quickly to overcome the flood in collaboration with various other agencies, the TNI-Polri, the youth community, and the community.

There are several aspects that cause flooding namely, the first is influenced by high rainfall, the second is the topographic condition of the Cycloop mountain with a slope of 60-90 degrees, the third aspect is the change in land function in several areas of the Cycloop mountains into residential areas carried out by residents, the fourth is not the maximum role of the government in coordinating and cooperating with related agencies and the community in disaster management, The fifth is the low handling of rehabilitation and reconstruction so that supporting facilities are inadequate and lastly the lack of public knowledge and awareness about disasters (Sumber BPBD, 2022).

The objectives of this study are to Identify policies and programs that have been implemented by the Jayapura Regency Government in flood management in Sentani District, Analyze the role and involvement of various stakeholders in flood disaster management in Sentani District, Assess the capacity and readiness of the Jayapura Regency Government in facing future flood disasters, Identify obstacles and challenges faced in flood disaster management in Sentani District, as well as Developing recommendations for strategies to improve more effective and sustainable flood disaster management in Sentani District.

## 2. Materials and Methods

To answer the problems and research objectives, this study will explain (descriptive) using qualitative research methods. Primary data collection techniques through interviews, observations and documentation combined with QSPM (Quantitative Strategic Planning Matrix) analysis (Creswell, 2013). While secondary data through various references to books, documents, and information use literature studies to support the primary data.

## 3. Result and Discussion

Sentani District is located in Jayapura Regency, Papua Province, and serves as the city center of Jayapura Regency. This district has 3 villages and 7 villages with an area of 98.00 square kilometers. In 2023, the population of Sentani District is expected to reach approximately 73,977 people, with a population density of approximately 327.26 inhabitants per square kilometer.

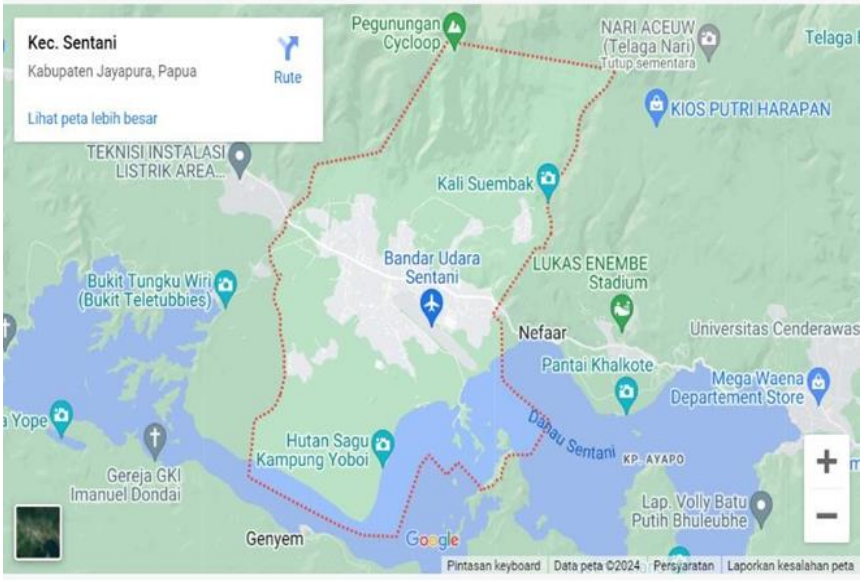


**Figure 2 Map of Sentani District**

Facing the challenges of floods that occur every year in Sentani District, researchers designed a flood management strategy by utilizing the SOAR approach (strength, opportunities, aspirations, result) as follows (Raharjo, 2009):

Strength

The strength factor is one of the elements that comes from the internal organization or institution. In this context, internal factors originate from the activities of the Daetrah Government, especially the Regional Disaster Management Agency of Jayapura Regency, which consists of:

1. Policy in Flood Disaster Management,
2. Regulation of the Regional Disaster Management Agency of Jayapura Regency,
3. Location of Sentani District within the Coverage of BPBD Jayapura Regency.

Opportunities

Opportunity is a clue in determining strategy. In this context, the Regional Disaster Management Agency of Jayapura Regency, as the institution responsible for disaster management in the region, has a strategic opportunity. The opportunity involves training programs and courses in disaster management, covering the pre-disaster stage, during the disaster, and also in the post-disaster stage, consisting of:

1. Map of Flood-Prone Areas of Sentani District,
2. Coordination and Cooperation,
3. General Policy Strategy and Direction.

Aspirations

Aspiration reflects the desired state or goal to be achieved. Communication is carried out by all parties in the organization to set goals and work plans so as to increase motivation and performance

and provide better service. In this context, various elements of both government and society have the right and authority to give their aspirations, consisting of:

1. Community Socialization and Approach,
2. Community Trust.

**Result**

Results refer to the results or consequences of actions or operators taken to achieve a goal. These results have an important role in cognitive processes and decision-making. The Results component in SOAR theory not only includes concrete results of action but also involves a process of evaluation, learning, and adaptation to support the achievement of desired aspirations or goals consisting of expectations and goals (Sukamto, 2015).

Furthermore, in the formulation of strategies using analysis that aims to determine the right strategy in flood disaster management, namely:

**Analysis Internal Factor Evaluation (IFE)**

Internal Factor Evaluation (IFE) is the process of recognizing internal elements in the form of strengths and opportunities.

**Table 2 Results of Internal Factor Evaluation (IFE) Matrix Analysis**

| Internal Factors | Bobot | Rating | Skor |
|---|---|---|---|
| Kekuatan (Strength) | | | |
| 1. Regional Regulation of Jayapura Regency Number 4 of 2011 concerning the Establishment, Organizational Structure, and Work Procedures of the Regional Disaster Management Agency of Jayapura Regency. | 0.081 | 4 | 0.324 |
| 2. The strategic geographical location is between the Cycloop Mountains and Lake Sentani. | 0.121 | 3 | 0.363 |
| 3. Natural resources that can still be improved. | 0.109 | 3 | 0.327 |
| 4. Sentani District has an average number of residents who participate in disaster management. | 0.151 | 2 | 0.302 |
| 5. Availability of accessible and affordable facilities for disaster management efforts. | 0.087 | 3 | 0.261 |
| Opportunities | | | |
| 1. Support from BPBD Jayapura Regency | 0.087 | 4 | 0.348 |
| 2. There is cooperation between the government and the Regional Apparatus Organization (OPD) indisaster management efforts, | 0.081 | 4 | 0.324 |
| 3. Increased community participation and awareness. | 0.109 | 3 | 0.327 |

| | | | | |
|---|---|---|---|---|
| 4. | Disaster management potential in disaster-prone areas. | 0.087 | 4 | 0.348 |
| 5. | Opportunities for local communities to gain knowledge about disaster management, both through formal and informal approaches. | 0.087 | 3 | 0.261 |
| | Total | 1.00 | 33 | 3.185 |

Source: Data processed by researchers, 2024

With rating:

1: Big weakness
2: minor weakness
3: small power
4: great power

Based on the results of the Internal Factor Evaluation (IFE) Matrix Analysis, a score of 3,185 is obtained, which indicates that if the score is above 2.5, internally, the organization has a stronger strategy opportunity.

**External Factor Evaluation (EFE) Analysis**

External Factor Evaluation (EFE) involves identifying internal elements, such as aspiration and results (Notowijoyo, 2015).

**Table 3 Results of External Factor Evaluation Matrix Analysis**

| | External factors | Quality | Rating | Score |
|---|---|---|---|---|
| | Aspiration | | | |
| 1. | The government is expected to accelerate development in disaster-prone areas. | 0.074 | 4 | 0.296 |
| 2. | In efforts to develop and develop disaster management by BPBD Jayapura Regency, collaboration is not only carried out independently, but also involves cooperation with related OPDs. | 0.068 | 4 | 0.272 |
| 3. | Local governments in the development and development process also actively involve community participation, especially in the context of disaster management. | 0.100 | 2 | 0.200 |
| 4. | Increasing awareness and quality of human resources can be achieved through community empowerment programs that are resilient to disasters. | 0.126 | 2 | 0.252 |

| | | | | |
|---|---|---|---|---|
| 5. | The formation of community groups is a means to increase cooperation in disaster management efforts. | 0.121 | 2 | 0.242 |
| Result | | | | |
| 1. | Acceleration of infrastructure, facilities and infrastructure development in disaster-prone areas. | 0.068 | 3 | 0.204 |
| 2. | Construction of facilities/infrastructure facilities carried out together with related OPDs as organizers. | 0.079 | 4 | 0.316 |
| 3. | Consistent maintenance of existing facilities, facilities, and supporting infrastructure. | 0.116 | 3 | 0.348 |
| 4. | Implementation of socialization by utilizing existing resources through the era of digitalization. | 0.137 | 2 | 0.274 |
| 5. | The formation of community groups (disaster resilient group organizations) led by BPBD Jayapura Regency. | 0.111 | 2 | 0.222 |
| | Total | 1.00 | 28 | 2.624 |

Source: Data processed by researchers, 2024

With rating:

1 = jellyfish response

2 = Respond Average

3 = above-average response

4 = overwhelming response

Based on the results of the External Factor Evaluation (EFE) Matrix Analysis, a score of 2,624 is obtained which indicates that a score above 2.5 characterizes that externally existing aspirations greatly affect the organization.

**Internal – External Matrix Analysis**

After obtaining the total weight, rating, and score values for each matrix, consisting of strengths and opportunities in the Internal Factor Evaluation (IFE), as well as aspirations and results in the External Factor Evaluation (EFE), the data will be unified in the Internal-External Matrix (IE). It aims to determine the position of the organization and alternative strategies that are considered more suitable based on the results of the analysis of the position of the organization (Ramli, 2010).

The results of Internal – External (IE) in the picture above with the average value of Internal Factor Evaluation (IFE) is 3,185 then External Factor Evaluation (EFE) 2,624, showing the position of Sentani District is in cell IV. In this position, the most appropriate strategy to apply is to grow and build.

## SOAR (Strength, Opportunities, Aspiration, Result)

In this step, we will describe the process of recognizing the factors associated with each element in the SOAR framework (Strength, Opportunities, Aspiration, Result) and implementing strategies based on these elements (Stavros et al., 2003).

Referring to the SOAR analysis that has been described by the researcher as explained earlier, the researcher tried to formulate alternative strategies that can be considered for the Regional Government of Jayapura Regency in continuing the development of flood disaster management strategies, namely (Triton, 2011)

Strategy 1: Strategies that need to be carried out by the Regional Government of Jayapura Regency in flood disaster management related to the development of infrastructure/infrastructure facilities in disaster-prone areas, namely by carrying out a program of development acceleration activities in the disaster sector and making these activities a priority activity by improving facilities by focusing on accelerating development involving cooperation with related OPDs and support from society; Establishment of activity programs by empowering communities for disaster management

Strategy 2: the strategy that needs to be carried out by the Jayapura Regency Government is to build cooperation from related OPDs in the development of infrastructure/infrastructure facilities in disaster-prone areas, namely the Jayapura Regency Disaster Management Agency takes firm action on the implementation of development in a binding activity program and in its work is based on existing regulations.

Strategy 3: The strategy that needs to be carried out by the Regional Government of Jayapura Regency is to conduct disaster socialization, namely to encourage the government and the community to create a conducive climate for the growth and development of environmental care. The disaster resilience program aims to increase the capacity of the community as environmental managers to improve community security. Then proceed with providing education/training or proposing comparative study activities to areas with environmental security.

Strategy 4: the strategy that needs to be carried out by the Jayapura Regency Government is in an effort to create a sense of security, maintain cleanliness and environmental sustainability in Sentani District, local governments, especially BPBD Jayapura Regency form a disaster resilient group. This group was formed as a coordinator and person in charge of all activities in the environment.

Strategy 5: a strategy that needs to be carried out by the Jayapura Regency Government to promote environmental awareness in Sentani District by utilizing natural resources, the strategic geographical location of Sentani District, and the diversity of the surrounding environment. BPBD needs to carry out socialization through digitalization of information media.

**QSPM (Quantitative Strategic Planning Matrix)**

The final step in the strategy proposal after choosing an alternative strategy is to decide to determine the most appropriate strategy to be implemented by the Regional Government of Jayapura Regency. The QSPM (Quantitative Strategic Planning Matrix) aims to summarize and objectively evaluate various alternatives, considering previously identified internal and external factors. QSPM is obtained through calculations by multiplying the average weight of internal and external factors of the organization by the AS value (attractiveness score) so as to get the TAS (total attractiveness score) (M. E. David et al., 2009). This matrix will produce alternative strategic actions that can be implemented by the Jayapura District Government.

**Table 4 Strategy Ranking Results of QSPM (Quantitative Strategic Planning Matrix) Matrix Analysis**

| No | Strategic Alternatives | Bag Score | Rank |
|---|---|---|---|
| 1 | Strategy to accelerate disaster sector development and make these activities a priority activity by improving facilities by focusing on accelerating development involving cooperation with related OPDs and support from the community; establishment of activity programs by empowering communities for progress Disaster | 6.142 | 2 |
| 2 | The strategy that needs to be carried out by the Jayapura Regency Government is to build cooperation from OPD related to the development of infrastructure/infrastructure facilities in disaster-prone areas by taking firm action on the implementation of development and development in disaster-prone areas in a binding activity program and in its work based on on existing regulations | 6.326 | 1 |
| 3 | The strategy that needs to be done by the Jayapura Regency Government is to carry out disaster socialization, namely to encourage the government and the community to create a conducive environment for disaster management. The Tangguh bencana program aims to increase the capacity of the community as environmental managers in improving community welfare and security. Then proceed with providing education/training or proposing comparative study activities to regions with the security of its territory. | 5.840 | 3 |
| 4 | The strategy that needs to be carried out by the Jayapura Regency Government is in an effort to create a sense of security, maintain | 3.352 | 5 |

| No | Strategic Alternatives | Bag Score | Rank |
|---|---|---|---|
| | cleanliness and environmental sustainability in Sentani District, local governments, especially BPBD Jayapura Regency formed a disaster resilient group under the BPBD of Jayapura Regency. This group was formed as the coordinator and person in charge of all environmental activities in Sentani District | | |
| 5 | The strategy that needs to be carried out by the Regional Government of Jayapura Regency is to promote by utilizing natural resources and the strategic geographical location of Sentani District, the need for BPBD Jayapura Regency to carry out socialization through digitalization information media in increasing the promotion of environmental awareness in Sentani District. | 4.412 | 4 |

Source: Data processed by researchers, 2024

Based on the evaluation of the QSPM matrix and the comparison of tables that have been carried out, it can be concluded that the strategic priorities for the Jayapura Regency Government are as follows:

The main strategy that must be carried out is to strengthen cooperation with related OPDs in building infrastructure and infrastructure facilities in disaster-prone areas. This includes strict action on the implementation of disaster management development and development programs that are binding and in accordance with applicable regulations.

In addition, the last strategy is to ensure safety, cleanliness, and environmental sustainability in Sentani District. To achieve this, local governments, especially BPBD Jayapura Regency, are expected to form an environmental management group led by BPBD Jayapura Regency. This group is responsible for coordinating and implementing all environmental activities in Sentani District.

## 4. Conclusion

Strategies for overcoming obstacles arising in flood disaster management in Sentani District are as follows: 1) The IFE (Internal Factor Evaluation) matrix shows that areas in Sentani District have strong strategy opportunities. This is evidenced by a total result of 3,185, which indicates that if the score is above 2.5, the organization has a stronger strategy opportunity internally. 2) The EFE

(External Factor Evaluation) matrix shows that existing aspirations greatly affect flood disaster management strategies in Sentani District, as evidenced by a total EFE (External Factor Evaluation) matrix of 2,624, which indicates that a score above 2.5 indicates that externally existing aspirations greatly affect the organization. 3) IE (Internal-External Matrix) matrix results are obtained from IFE (Internal Factor Evaluation) and EFE (External Factor Evaluation), which are used to compile the IE (Internal-External Matrix) matrix. The IFE (Internal Factor Evaluation) matrix value is 3.185, and EFE (External Factor Evaluation) is 2.624. This shows that the position of the Jayapura Regency Disaster Management Agency is in cell IV, which means that in this position, the right strategy to use is to grow and build. 4) Based on the results of the analysis of internal factors and external factors of the organization, alternative strategies based on the SOAR matrix (Strengths, Opportunities, Aspirations, Results), namely Strategy I: development acceleration program in disaster-prone areas; Strategy II: cooperation with OPD related to the development and development of disaster-prone areas based on regulations; Strategy III: socialization of environmental and disaster care to the community; Strategy IV: the government makes community groups disaster resilient; and Strategy V: environmental promotion by the Regional Disaster Management Agency. 5) Based on the determination of strategy based on SOAR analysis, the QSPM (Quantitative Strategic Planning Matrix) will produce alternative strategies that can be applied by BPBD Jayapura Regency in flood disaster management, namely strategy II the strategy that needs to be carried out by the Jayapura Regency Government is to build cooperation from related OPD in the development of infrastructure/infrastructure facilities in disaster-prone areas, namely, take firm action on the implementation of development and development in disaster-prone areas in a binding activity program and in its work based on existing regulations.

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