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EVALUATE THE IMPACT OF AVAILABILITY PROBLEMS DEEP RESERVOIR WATER SUPPORTS CLEAN WATER QUALITY IN EAST TANJUNGPINANG DISTRICT

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Abstrak

Clean water is a basic need for the survival of humans and other living creatures. In East Tanjungpinang District, Tanjungpinang City, reservoirs are the main source of clean water for the community. As the population increases, the need for clean water also increases and the problem of clean water is significant regarding the availability of reservoir water to support clean water quality in East Tanjungpinang sub-district, Tanjungpinang city. To meet the need for clean water, the main source of which is reservoir water, serious attention is needed from the government, related sectors and the community. Reservoirs are the main source to support clean water quality. Therefore, an in-depth evaluation of the impact of the problem of reservoir water availability in supporting clean water quality in East Tanjungpinang District, Tanjungpinang City is needed, such as a decrease in reservoir water discharge which causes a reduction in clean water reserves, increased pollution due to waste. around the reservoir and sedimentation occurs at the bottom of the reservoir, causing shallowing of the reservoir and reducing the volume and quality of the water.
It is hoped that this evaluation can evaluate the impact of reservoir water availability problems in supporting clean water quality in East Tanjungpinang subdistrict and become valuable input for the government, related institutions and the community in formulating policies and strategies for sustainable clean water management in East Tanjungpinang subdistrict, Tanjungpinang city.In this way, the availability of quality and sustainable clean water can be guaranteed, the quality of regional facilities can be improved, and community welfare can be realized.

Keywords: Availability of reservoir water, clean water quality, environmental pollution

I. PENDAHULUAN

The Importance of Clean Water for the Lives of the People of East Tanjungpinang District. Clean water is a natural resource that is very important for human life. Clean water has many benefits, including: Clean water is used for drinking, cooking, bathing, washing and other sanitation purposes. Consuming clean water can help maintain body health and prevent disease. Access to clean water can improve people's quality of life, especially in the fields of health, education and the economy. Clean water is used in various economic activities, such as agriculture, industry and tourism. Clean water used wisely can help preserve the environment. The problem of reservoir water availability faced in East Tanjungpinang sub-district is currently facing an increasingly worrying problem of reservoir water availability. This is caused by several factors including limited water sources, dependence on seasonal rainwater causes a lack of water availability, especially in the dry season. The increase in population in East Tanjungpinang sub-district has resulted in a

significant increase in the need for clean water. Increasing living standards and changes in people's lifestyles,Reservoir damage includes sedimentation and lack of maintenance, reservoir water pollution, lack of public awareness.

The impacts caused by the problem of reservoir water availability on the quality of clean water in East Tanjungpinang sub-district include a decrease in clean water quality, an increase in water treatment costs,health impact, dsocial impact and economic impact and environmental impact. Based on several of these problems, it is necessary to evaluate the impact of the problem of reservoir water availability in supporting clean water quality in East Tanjungpinang sub-district, Tanjungpinang City.

Geographically, the city of Tanjungpinang is located at coordinates 0°51' to 0°59' North Latitude and 104°23' to 104°34' East Longitude. Tanjungpinang City area boundaries:

1. To the north it borders Bintan Regency
2. To the south it borders Bintan Regency
3. To the west it borders Batam City
4. To the east it borders Bintan Regency.

The area is 239.50 km2, the average height is 2 meters above sea level. The climate is tropical with two seasons, namely the dry season and the rainy season. Part of the Tanjungpinang City area is marine, with a land area of around 131.54 square kilometers and a sea area of around 107.96 square kilometers.

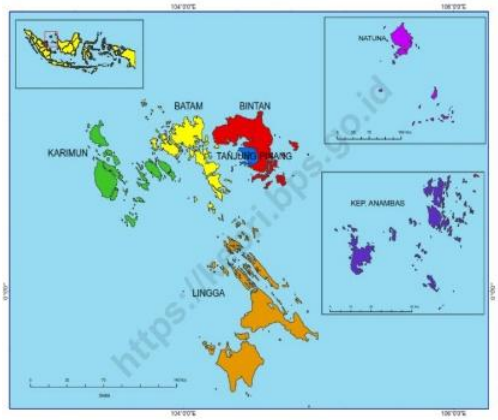

Figure 1 *Map of Riau Islands Province*

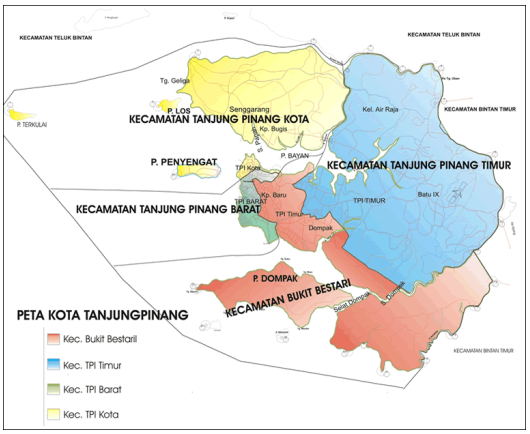

Figure 2 *City Map of Tanjungpinang City*

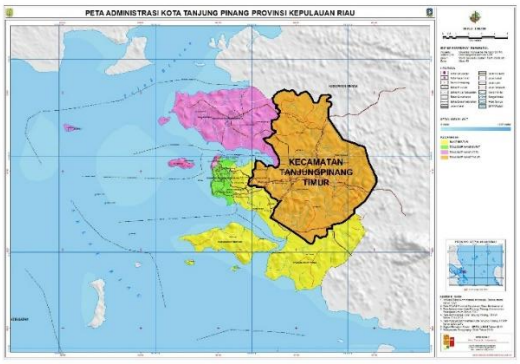

Figure 3 *Map of East Tanjungpinang sub-district*

Population and Demographic Data for East Tanjungpinang District:

Table 1 *Population of Kec. East Tanjungpinang*

	Kecamatan *Subdistrict*	Laki-laki *Male*	Perempuan *Female*	Jumlah *Total*
	(1)	(2)	(3)	(4)
1.	Bukit Bestari	27 583	27 329	54 912
2.	Tanjungpinang Timur	60 801	59 679	120 480
3.	Tanjungpinang Kota	10 147	9 700	19 847
4.	Tanjungpinang Barat	22 302	22 313	44 615
	2022	120 833	119 021	239 854

1. Population of East Tanjungpinang District120,480 people
2. Population Growth RateGrowth rate = ((120,480 - 114,875) / 114,875) x 100% = 4.88%
3. Male: 60,801 people (50.47%)
4. Female: 59,679 people (49.53%)
5. The area of East Tanjungpinang District is 58.95 km
6. Population Density: 2,044 people/km²

Table 2 *Area of East Tanjungpinang District*

Kelurahan *Kelurahan*	Luas Daratan (Km) *Total Area (Km)*	Persentase terhadap Luas Kecamatan *Percentage to Subdistrict's Area*	Jumlah Pulau *Number of Islands*
(1)	(2)	(3)	(4)
1. Batu IX	18,99	32,22	-
2. Melayu Kota Piring	3,42	5,80	-
3. Air Raja	18,83	31,94	-
4. Pinang Kencana	15,67	26,58	-
5. Kampung Bulang	2,04	3,46	-
Kec.Tanjungpinang Timur *Tanjungpinang Timur Subdistrict*	**58,95**	**100,00**	-

1. Number of Community Health Centers: 3 units
2. Number of Hospitals: 2 units

Topography:

1. Most of the East Tanjungpinang District is lowland with an average height of 0-15 meters above sea level.
2. There are several small hills in the southern part of the sub-district.
3. East Tanjungpinang District has a long coastline, which is around 15 kilometers.

Climate:

1. East Tanjungpinang District has a tropical climate with two seasons, namely the dry season and the rainy season.
2. The dry season lasts from June to October.
3. The rainy season lasts from November to May.
4. The average annual air temperature ranges from 27°C to 30°C.
5. Average annual air humidity ranges from 80% to 90%.
6. Average annual rainfall ranges from 2,000 to 2,500 millimeters.

East Tanjungpinang District is a district that is developing rapidly in various fields in accordance with various activities such as very rapid housing development towards East Tanjungpinang District, economic development, trade, services and industry in line with population growth. The development of various activities and population definitely requires an increase in clean water. Currently, in the city of Tanjungpinang, the supply of clean water comes from the Regional Drinking Water Company. The water source is from the Pulai River Reservoir and the Gesek River Reservoir. The first reservoir water source used was the Pulai River Reservoir which was built in 1978 and became the main source of raw water for the Regional Drinking Water Company (PDAM Tirta Kepri) which isserving most of the flow of the Pulai River Reservoir, Tanjungpinang City, including East Tanjungpinang District.

Sungai Pulai Reservoir
Reservoir Conditions:

1. Water capacity:
   1) The reservoir water level is currently around 90 cm. (depending on rainfall).
   2) The current volume of reservoir water is around 27 million cubic meters (depending on rainfall).
   3) Area: 751.80 hectares.
   4) The normal storage capacity of the reservoir is 37.45 million cubic meters.
2. The water quality of the Sungai Pulai reservoir is good enough to be used as raw water.
3. The Sungai Pulai Reservoir is still experiencing shallowing
4. PDAM Tirta Kepri's raw water production from Sungai Pulai Reservoir is still being used and is still being distributed.

PDAM Tirta Kepri's clean water processing system from the Pulai River reservoir consists of several stages including :

Collecting raw water by :

1. Water is taken from the Pulai River reservoir using a pump.
2. Water taken from reservoirs is monitored periodically to determine drinking water quality standards.

Pre Processing :

1. Raw water is channeled into the initial reservoir to settle coarse dirt

2. The water is then filtered with a finer filter.

Processing:
Water is channeled to the Sungai Pulai Water Treatment Plant (IPA) through several processes including:

1. Coagulation and flocculation: Chemicals are added to water to coagulate the small particles present in the water.
2. Sedimentation: Water flows into a sedimentation tank to settle the lumps.
3. Filtration: Water is filtered with sand and anthracite to remove residual lumps and other small particles.
4. Disinfection: Water is treated with chlorine or ozone to kill bacteria and other microorganisms.

Distribution

1. Clean water that has been treated is channeled to the clean water reservoir.
2. From the reservoir, water is distributed to customers through a network of water pipes.

Sungai Pulai Reservoir has several weaknesses including:

1. The availability of raw water in the Sungai Pulai Reservoir depends on rainfall.
2. Water pollution around reservoirs can be caused by various factors, such as:
   1) Household waste
   2) Industrial waste
   3) Agricultural waste
3. Water pollution can result in a decrease in raw water quality and increase the cost of clean water processing.
4. Clean water treatment infrastructure, such as water pipes and water pumps, needs to be maintained and repaired regularly to ensure the smooth distribution of clean water

Figure 4 *River Reservoir MapPulai*

Figure 5 *Sungai Pulai Reservoir*

Figure 6 *River ReservoirPulai*

Figure 7 *River ReservoirPulai*

Gesek River Reservoir

The Gesek River Reservoir is located in Toapaya District, Bintan Regency, Riau Islands, built in 1995.

Reservoir Conditions :

1. Water capacity :
   1) Water height 1.8M (May 2024) depending on rainfall.
   2) Area 180 Ha
   3) Water Height 1.8M (May 2024) depending on rainfall)
   4) Normal storage capacity is 10.4 million cubic meters
2. The water quality of the Gesek River reservoir is good enough to be used as raw water.
3. Efforts to deepen the reservoir are still ongoing to increase water storage capacity.
4. PDAM Tirta Kepri's raw water production from the Gesek River Reservoir is still being used and is still being distributed.

PDAM Tirta Kepri's clean water processing system from the Gesek River reservoir consists of several stages including :

Collecting raw water by :

1. Water is taken from the Gesek river reservoir using a pump.
2. Water taken from reservoirs is monitored periodically to determine drinking water quality standards.

Pre Processing:

1. Raw water flows into the initial reservoir to settle coarse dirt
2. The water is then filtered with a finer filter.

Processing:

Water is channeled to the Sungai Pulai Water Treatment Plant (IPA) through several processes including:

1. Chemicals are added to water to coagulate the small particles found in the water.
2. Water is channeled into a sedimentation tank to settle the lumps.
3. The water is filtered with sand and anthracite to remove residual lumps and other small particles.
4. Water is treated with chlorine or ozone to kill bacteria and other microorganisms.

Distribution

1. Clean water that has been treated is channeled to the clean water reservoir.
2. From the reservoir, water is distributed to customers through a network of water pipes.

The Gesek River Reservoir has several weaknesses including :

1. **Raw water availability :** The Gesek River Reservoir has no springs and only relies on rainwater.
2. **Raw water quality :** The quality of raw water in the Gesek River Reservoir is lower due to the influence of pollution around the reservoir.

Figure 8 *Gesek River Reservoir*

Figure 9 *Gesek River Reservoir*

Figure 10 *Gesek River Reservoir*

Figure 11 *Gesek River Reservoir*

Figure 12 *Gesek River Reservoir*

1. FORMULATION OF THE PROBLEM

1. How does the problem of reservoir water availability affect the quality of clean water in East Tanjungpinang District?
2. What are the factors that cause problems with reservoir water availability in East Tanjungpinang District?
3. What efforts can be made to overcome the problem of reservoir water availability to improve the quality of clean water in the city of Tanjung Pinang?

II. LITERATURE REVIEW

The definition of clean water, clean water is water that meets health requirements and can be used for daily needs, such as:

1. Drinking clean water must be free from dangerous microorganisms such as bacteria, viruses and parasites.
2. Cooking, Clean water must be free from harmful chemicals that can contaminate food.
3. Bathing and washing, clean water must be free from dirt and bacteria that can cause skin diseases.
4. Watering plants, clean water must be free from harmful chemicals that can damage plants.

5. Washing clothes. Clean water must be free from dirt and bacteria that can stick to clothes.

1. Basic Concepts of Water Resources Management, Including Reservoirs Water resources management is a process that aims to maintain, preserve and utilize water resources in a sustainable manner. Basic concepts in water resources management include:
   1) Integrated management by considering economic, social and environmental aspects.
   2) Water resources management is carried out by considering watersheds, such as upstream, middle and downstream rivers.
   3) Water resources management must be sustainable.

2. The impact of poor reservoir water quality on human health and the environment. Decreased reservoir water quality can have a negative impact on:
   1) Human health: Polluted reservoir water can cause various diseases, such as diarrhea, cholera and typhoid.
   2) Environment: Decreasing reservoir water quality can disrupt the reservoir ecosystem and cause the death of aquatic biota.

III. RESEARCH METHODS

1. Qualitative and quantitative approaches

to measure variables related to reservoir water availability, clean water needs, and their impacts.

1. **A qualitative approach can be used to**
   1) Understanding community perceptions about the availability of reservoir water and the need for clean water. This can be done through interviews and discussions
   2) Knowing the impact of the availability of reservoir water and the need for clean water on people's lives. This can be done through case studies

2. **Qualitative Data Collection Techniques**
   1) Interviews can be conducted with individuals or groups to obtain in-depth information about their experiences and perspectives regarding reservoir water availability and clean water needs.
   2) Case studies involve researchers examining in depth several cases to understand the complexities related to reservoir water availability and clean water needs.

3. **Quantitative approach**
   1) Measuring reservoir water availability can be done by monitoring reservoir water volume, rainfall and river flow.
   2) Estimating clean water needs can be done by considering population, water consumption levels, and water use patterns.
   3) Analyzing the impact of reservoir water availability and clean water needs on various indicators, such as public health, the economy and the environment using statistics

4. **Quantitative Data Collection Techniques:**
   1) Surveys involve collecting data from a large sample of the population through questionnaires.

Qualitative and quantitative approaches to measure variables related to reservoir water availability, clean water needs and impacts. Both qualitative and quantitative approaches can be used to gain a more comprehensive understanding of complex phenomena.

Data collection techniques that will be used, such as observation, interviews, questionnaires, and document analysis by:

1. Field observation
2. Water Sampling
3. Reservoir Water Analysis in the Laboratory
4. Interviewing various parties related to the reservoir
5. Distributing questionnaires to communities around the reservoir

Data collection techniques are useful for:

1. Understand the current condition of reservoir water availability
2. Understand the current water quality of the reservoir
3. Understanding the need for clean water in East Tanjungpinang District
4. Understand the impact of reservoir water availability problems on clean water quality
5. Understand the impact of reservoir water availability problems on public health, the economy and the environment

2. Grand Theory

Clean water is a primary need for humans. In Indonesia, reservoir water is an important source of clean water. However, problems with reservoir water availability often occur, especially in densely populated urban areas. This can have an impact on the quality of clean water received by the community.

East Tanjungpinang District, as one of the sub-districts in Tanjungpinang City, Riau Islands, also experiences problems with reservoir water availability. This is due to several factors, such as:

1. Rapid population growth in East Tanjungpinang district can also increase demand for clean water.
2. Climate changes such as drought and changes in rain patterns can reduce water flow into reservoirs.
3. Pollution can reduce the quality of reservoir water

The problem of reservoir water availability can have a negative impact on the quality of clean water in East Tanjungpinang District. These negative impacts include:

1. Decreased water quality. Polluted reservoir water can cause a decrease in quality, which can cause disease in humans.
2. Lack of clean water can disrupt people's daily activities.
3. Fighting over water sources can trigger social conflict in society.

Grand theory also considers various aspects, such as:

1. **Biophysical aspects**namely understanding the biophysical conditions of reservoirs and river basins, including rainfall, evapotranspiration and water quality.
2. **Social aspect**namely understanding community water needs, water use patterns, and cultural values related to water.
3. **Economic aspect**that is, understanding the costs and benefits of various possible solutions.
4. **Institutional aspects**namely understanding the roles and responsibilities of various parties in reservoir water management.

With Grand theory, we have several strategies and solutions to overcome the problem of reservoir water availability and its impact on clean water quality in East Tanjungpinang District. These strategies and solutions must be participatory and sustainable.

Several strategies and solutions that can be applied with several theories include:

1. System Theory, namely the system as a collection of interrelated elements in the provision of clean water in East Tanjungpinang District. The elements in the system include water sources, water infrastructure, water management, and water quality including :
   1) Surface water sources, There are several rivers and reservoirs
   2) The problem is that ground water is decreasing due to over-exploitation and pollution.
   3) Evaluation, Looking for new sources of raw water
   4) Water Infrastructure: The PDAM pipe network has reached some areas but its coverage is still limited. The problem is water leaks because the PDAM pipe network still experiences leaks which cause water loss.
   5) Evaluation and Improvement of infrastructure, Expanding the PDAM pipe network
   6) Water Treatment, PDAM Tirta Kepri processes water before distributing it to customers.
      - The problem is that piled up rubbish and silting in rivers and reservoirs can pollute water sources.

- Evaluation, carrying out normalization to overcome silting and cleaning up rubbish around the reservoir.

7) Pipeline Network Distribution, PDAM Tirta Kepri distributes clean water to household, agency and business customers.
8) The problem is the lack of public awareness in saving water and maintaining a clean environment.
9) Evaluate, provide education and socialize the importance of saving, utilizing and conserving water.

2. **Ecological Theory**namely an approach that views humans as an integral part of the ecosystem and emphasizes the reciprocal relationship between humans and the environment.
   1) In evaluation, the government, related departments and the community must continue to maintain the availability of quality clean water and preserve the environment.

3. **Sustainable Development Theory**which emphasizes the importance of balance between economic, social and environmental development. Sustainable development is used to assess solutions to the problem of clean water needs that are sustainable and environmentally friendly.
   1) Evaluation, in collaboration with various parties, it is hoped that the problem of clean water needs in East Tanjungpinang District can be resolved effectively and sustainably, so that environmental sustainability is maintained.

The problem of reservoir water availability and its impact on clean water quality in East Tanjungpinang District requires a comprehensive solution. Grand theoryIt is hoped that proposed in this paper will be the basis for developing effective strategies and solutions to overcome these problems.

SWOT ANALYSIS

Strengths

1. The reservoir is a reliable water source to meet clean water needs in East Tanjungpinang District.
2. Reservoir water quality is generally better maintained than other water sources, such as river water or ground water.
3. The reservoir has the potential to be developed as a source of raw water for PDAM, tourism and irrigation.

Weaknesses

1. Reservoir water availability may vary depending on the season and rainfall.
2. Reservoirs are vulnerable to water pollution due to household, industrial and agricultural waste.
3. Reservoir infrastructure, such as dams and water channels, can be damaged due to natural factors or human negligence.

Opportunities

1. More advanced water treatment technologies can be used to improve reservoir water quality.
2. Collaboration between the government, private and community sectors can help in more sustainable reservoir management.
3. Increasing public awareness about the importance of preserving reservoirs can help prevent water pollution.

Threats

1. Climate change can cause drought and reduced rainfall, which can impact reservoir water availability.
2. Increasing population can increase demand for fresh water, which can strain reservoir capacity.
3. Water conflicts between reservoir users can result in disruption of clean water supplies.

STRATEGIES THAT CAN BE TAKEN
SO (Strength-Opportunity)

1. Utilizing more advanced water treatment technology to improve reservoir water quality and meet the increasing need for clean water.

2. Increase cooperation between sectors to manage reservoirs sustainably and overcome the impacts of climate change.
3. Increase public awareness about the importance of preserving reservoirs and saving water.

ST (Strength-Threat) Strategy:

1. Strengthening reservoir infrastructure to increase resistance to damage due to natural factors or human negligence.
2. Develop alternative water sources, such as rainwater and desalinated water, to reduce dependence on reservoir water and anticipate drought.
3. Increase education and training for the community regarding sustainable water management and preventing water pollution

WO (Weaknesses – Opportunities)

1. Increase wastewater processing capacity to reduce reservoir water pollution and utilize treated wastewater for various purposes.
2. Developing environmentally friendly reservoir tourism to increase income and encourage the community to preserve the reservoir.
3. Utilizing information and communication technology to increase community participation in reservoir management and water quality monitoring

WT (Weaknesses – Threats)

1. Conduct regular risk mapping to identify and anticipate potential threats to reservoir water availability and clean water quality.
2. Improve coordination between related agencies to respond quickly and effectively to natural disasters or water pollution that may occur.
3. Building clean water reserves to anticipate disruptions in clean water supply due to infrastructure damage or water conflicts.

SWOT analysis shows that the problem of reservoir water availability in East Tanjungpinang District has a significant impact on the quality of clean water in the area. The positive impact is that the reservoir is a source of abundant and quality water, with the potential to be developed. However, the negative impact is uneven water availability, water pollution, infrastructure damage, and various other threats. To overcome this problem, comprehensive efforts are needed from various parties, such as:

1. Improved reservoir management: Reservoir management needs to be improved by implementing more advanced technology, increasing cooperation between sectors, and increasing public awareness.
2. Water saving: People need to be encouraged to save water and use water wisely.
3. Development of alternative water sources: It is necessary to develop alternative water sources, such as rainwater and desalinated water, to reduce dependence on reservoir water

With planned and sustainable efforts, it is hoped that the problem of reservoir water availability in East Tanjungpinang District can be overcome and the quality of clean water in the area can be improved.

IV. RESULTS AND DISCUSSION

1. The influence of reservoir water availability problems on clean water quality in East Tanjungpinang District

1) Reservoir Water Availability

a) The volume of reservoir water in East Tanjungpinang District has decreased significantly in recent years.
b) The decrease in reservoir water volume is caused by several factors, such as heavy rainfall and high evaporation.
c) The decrease in reservoir water volume results in a reduction in the supply of raw water for clean water processing.

2) Reservoir Water Quality

a) The water quality of the reservoir in East Tanjungpinang District does not meet clean water quality standards.

b) Reservoir water quality is polluted by various pollutants, such as domestic waste, industrial waste and agricultural waste.

3) Impact of Reservoir Water Availability Problems on Clean Water Quality

a) The decrease in reservoir water volume and reservoir water pollution results in a decrease in the quality of clean water produced by PDAM.
b) The clean water distributed by PDAM does not meet clean water quality standards.

4) Poor clean water quality results in various negative impacts, such as :

a) Health: Increased diarrhea, cholera and typhoid.
b) Economy: Increase in clean water treatment costs and health costs.
c) Environment: Damage to water ecosystems and environmental pollution

2. Factors Causing Problems with Reservoir Water Availability in East Tanjungpinang District
   1) Decrease in Rainfall, Rainfall in East Tanjungpinang District has decreased in recent years due to global climate change.
   2) This decrease in rainfall results in a reduction in water sources entering the reservoir.
   3) Reservoir Water Pollution
   4) Damage to Reservoir Water Management Infrastructure.
   5) Lack of infrastructure maintenance

3. Efforts that can be made to overcome the problem of reservoir water availability and improve the quality of clean water in East Tanjungpinang District.
   1) Sustainable Management of DAS (River Watersheds).
   2) Carry out reforestation in the upstream area of the reservoir to increase groundwater absorption and reduce soil erosion.
   3) Implement a sustainable forest management system.
   4) Application of Reservoir Water Treatment Technology
   5) Clean Water Infrastructure Development and Rehabilitation:
      a) Expanding the clean water pipe network to all areas in East Tanjungpinang District.
      b) Rehabilitating old and leaking clean water pipe networks.
      c) Building clean water processing infrastructure with large capacity to meet community needs.
   6) Implementation of Clean Water Quality Standards
      a) Tighten supervision of the quality of clean water distributed by PDAM.
      b) Conduct regular water quality tests to ensure clean water meets established standards.
      c) Increase public education about the importance of consuming clean, quality water.
   7) Efforts to Increase Public Awareness
   8) Increasing Community Participation
      a) Providing training and education to the community about sustainable management of reservoir water and clean water.
   9) Efforts to Increase Collaboration Between Stakeholders
      a) Coordination Between Government Agencies
      b) Collaboration with the Private Sector and Community

V. KESIMPULAN

Based on the results of research and discussion, the availability of Pulai river reservoir water and Gesek river reservoir water has a significant impact on the quality of clean water in East Tanjungpinang sub-district. The decrease in reservoir water volume and reservoir water pollution results in a decrease in the quality of clean water produced by PDAM and results in various negative impacts on health, the economy and the environment.

This problem is caused by several factors, including :

1. Decreased rainfall
2. Increased evaporation
3. Reservoir water pollution
4. Damage to reservoir water processing infrastructure. To overcome this problem, efforts and cooperation are needed, including:
    1) Improving sustainable management of DAS (River Watershed).
    2) Implement water use efficiency technology
    3) Improving reservoir water quality
    4) Improving clean water quality
    5) Improve rainwater management
    6) Increase public awareness
    7) Increase collaboration between stakeholders

SUGGESTION

1. The need for cooperation between government, private sector and society
2. Increasing human resources to use new technology in managing reservoir water and clean water.
3. Increase the budget to maintain reservoir water infrastructure and clean water.
4. Providing education to the public on the importance of conserving clean water in a sustainable manner.

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