

# Implementation of Domestic Wastewater Management Policy Analysis in Preserving Environmental Functions in Gorontalo City, Indonesia

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**Abstract:** Pollution due to domestic wastewater continues to increase so that the health problems of the city's people are disturbed. In addition, the infrastructure that has been built by the government cannot function optimally. Because it has never been noticed because there is no monitoring from the government, in addition to the presence of garbage or accumulation of soil so that the water channels are not smooth. There is no landscape engineering to direct rainwater so that it can flow to a safe place and also no permit for simple water treatment during house construction. So that domestic wastewater pollution continues to increase.

The implementation of policy analysis used by researchers is the theory put forward by Brian W. Hogwood and Lewis A. Gunn. The purpose of this study is to determine the stages of implementation of policy analysis, Wastewater management in the city of Gorontalo. The method used by researchers is qualitative, the novelty obtained by researchers is the method.

**Keywords:** Policy, Implementation, IPAL, IPLT.

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## I. INTRODUCTION

Domestic wastewater pollution is a deviation from the normal condition of water. When domestic waste is discharged into water, according to the Gorontalo City Statistics Agency, domestic pollution increases every year, to prevent large waste content and passing polluted liquids from seeping into the water. Based on data from the BPS (Central Statistics Agency), the proportion of households that have access to proper sanitation services according to their area of residence in 2022 was 83.8% for urban areas and 76.99% for rural areas (Ulya et al., 2023)

This was revealed in the Indonesia National Socioeconomic Survey, namely "There is a gap in access to drinking water and proper sanitation, according to subnational regions in Indonesia. Monitoring domestic disparities through these indicators serves to identify underserved areas, and is useful for developing approaches to improve access disparities that can help Indonesia make

progress towards the 2030 Sustainable Development Agenda. with very diverse problems, as written by the team researching domestic wastewater management in Monitoring Health Inequality in Indonesia is "universal access to safe and affordable sanitation and adequate hygiene in Indonesia is essential to ensuring healthy lives and improving well-being for all people at all ages" (Afifah et al., 2018). According to one expert in the implementation of public policy, it is called the implementing organization", meaning the government bureaucracy that has the responsibility to implement public policy. This is as stated by Ripley & Grace A. Franklin (1986: 33) that: "Bureaucracies are dominant in the implementation of programs and policies and have varying degrees of importance in other stages of the policy process. In policy and program formulation and legitimization activities, bureaucratic units play a large role, although they are not dominant". This means that these bureaucratic units are dominant in the implementation of programs and policies. In the formulation and legitimacy of policies and programs, although they have a broad role, they are not dominant

(Tachjan, 2006)

The policy issued by the Gorontalo city government, namely the wastewater management law number 9 of 2016, cannot run according to what is stated in the policy. There are several factors that cause the policy not to run as expected, so researchers use. The theory put forward by Brian W. Hogwood and Lewis A. Gunn to be able to find out the problems in the implementation of policy analysis in the city of Gorontalo is grouped into three, namely:

- Policy planning process, is an activity of formulating until a policy is made.
- Implementation process, is the implementation of policies that have been formulated
- Policy evaluation process, is the process of reviewing the implementation that has been implemented or in other words looking for answers to what happened as a result of the implementation of a particular policy and discussing the methods used with the results achieved

So that the author can see the problems that exist in domestic wastewater management policies. So the researcher took the title Implementation of Domestic Wastewater Management Policy Analysis in Preserving Environmental Functions in Gorontalo City.

## II. METHOD

Interviews, documentation and checking the validity of the data are basically, in addition to being used to counter the accusations against qualitative research that say it is unscientific, are also inseparable elements of the body of knowledge of qualitative research (Moleong, 2007: 320) (Endah, 2022). So that researchers collect all research data and then analyze it, so that this study obtains novelty so that it can be used to improve existing policies in the Gorontalo city government.

## III. RESEARCH RESULTS AND DISCUSSION

### A. Research Results

The stages of implementing domestic wastewater policy analysis in preserving the environment in the city of Gorontalo as stated by Brian W. Hogwood and Lewis A. Gunn with the following sub-focus:

#### ➤ Planning

Planning for the construction of communal wastewater treatment plants in this area, in addition to aiming to cut off domestic wastewater pollution to the environment, is directed

at saving water sources from domestic wastewater pollution so that groundwater depth is an influential factor. According to research by Rifai & Nugroho (2007), the factors that are used as references in the construction of a wastewater management system other than population density are slope, topography, clean water, soil permeability, and shallow groundwater (Susanthi et al., 2023).

#### ➤ Program Planning

The planning of the domestic wastewater management program in the city of Gorontalo does not have any landscape planning so that only the construction occurs. So that all development is neglected. There should be an increase in human resources who become technicians and an increase in the budget so that planning is better programmed.

#### B. Technical Planning

The planning in Gorontalo City has not been implemented, as expected. Because there are no clearly stated instructions. So that it can be a guide for other technicians to carry out domestic wastewater management. Clear technical planning regarding domestic technical planning, which is the hope of the Gorontalo city government.

The need for clear technical planning regarding domestic liquid waste in the form of domestic waste generated from household activities. Domestic liquid waste that is discharged directly into water bodies without going through a processing process will result in pollution of the ecosystem of the receiving water body (Sigit et al., 2023).

#### C. Budget Planning

Limited government funding sources for investment and development of domestic wastewater treatment, at IPLT and IPAL and low wastewater service rates resulting in a lack of operational and maintenance costs and development of wastewater management systems. The creation of IPLT and IPAL which is not managed properly so that it looks like a waste of budget, indeed every plan must have funds or a budget that must be spent while the funds are indeed used only for Development and Development only.

As stated by the researcher who said that "The Process Engineering Team compiles information about the equipment in a benchmark model. The compilation contains information about costs, reference years, scaling factors, scaling characteristics, design information, and reserve cost references. The information is stored in the economic spreadsheet section of the model" which means the need to prepare a budget plan for the expenditure used for technical implementation (Dutta et al., 2011).

- At this Stage it can be Described as Follows:

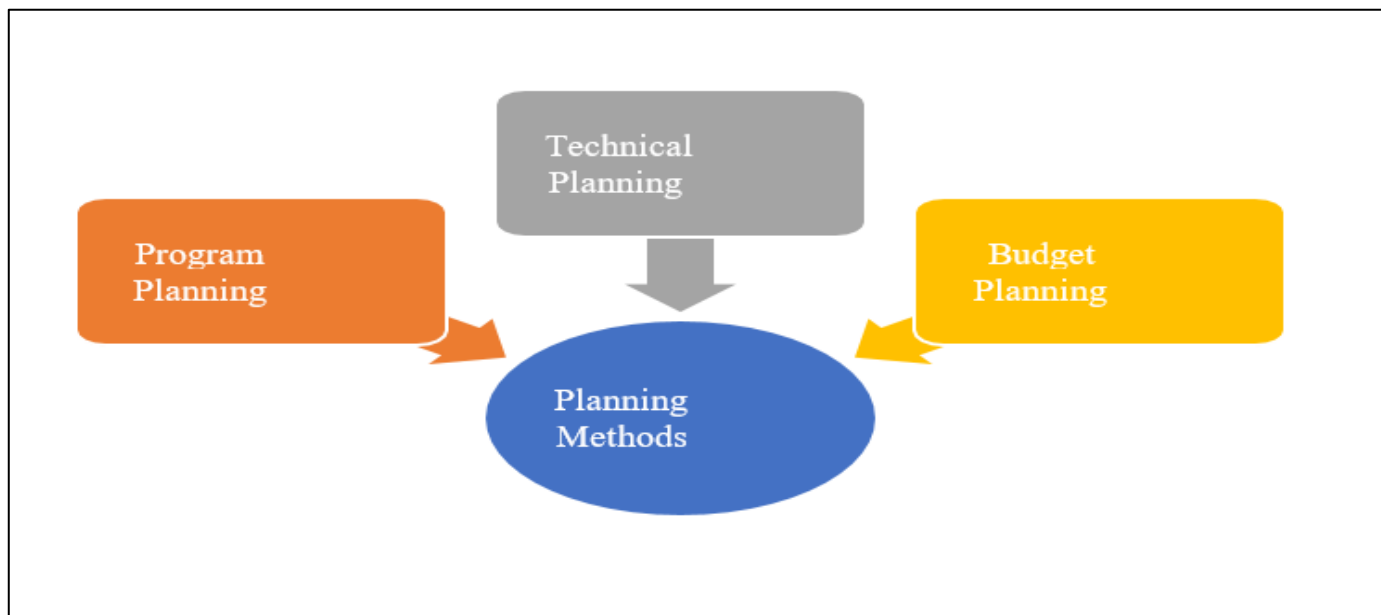


Fig 1 Planning Findings

The planning findings in the image above are planning methods. The phenomenon that occurs is in irregular program planning with no landscape planning and extension program planning, in technical planning provided by the government only assistance from the construction of IPAL, in budget planning, the budget issued is only small and the budget disbursement is difficult so that it is difficult to move.

#### ➤ Implementation

##### • Technical Implementation

In the Gorontalo City area, in the implementation of wastewater management, many people feel that wastewater management is not important or trivializes it, there are also people who feel that it is the responsibility of the government, Continuity of management implementation is the process of implementing continuous management that begins from the implementation of development to the management period. The hope to ensure continuity of responsibility and a sense of ownership is obtained from the results of in-depth interviews with the DLH institution because there is no clear SOP to move in so that the DLH institution that oversees IPLT clearly cannot run. Continuity of management is the continuity of management that begins from the implementation of development, to management. The hope to ensure the continuity of responsibility and sense of ownership, there should be a driving figure, the implementation that makes an influence on the community who is then appointed as the manager and maintainer of the IPAL (Mulyatama et al., 2024).

##### • Non-Technical Implementation

In fact, the Gorontalo City government has made a policy on wastewater management, namely number 9 of 2016 which is explained. Article 32 emphasizes that everyone who carries out a business and/or activity is obliged to provide correct and accurate information regarding the implementation of water quality management obligations and water pollution control. Strengthened by an interview with one of the home business actors in Gorontalo City who said that

"The wastewater produced by our home industry, we channel directly into the river, we don't understand if it has to be managed or what because all we know is that we channel it into the gutter and it is connected by the river, and I don't know if that is not allowed by the government", but after we told the community that it was not allowed, they answered that they did not understand it.

Furthermore, in the implementation related to public health, it must examine how pathogenic organisms should not be spread either by direct contact with feces and wastewater, or indirectly through water, soil or food, the selected treatment process must be able to achieve a high degree of pathogen elimination. Thus it can be said, the odor emitted must be below the threshold of disturbance. Each part of the system must not cause aesthetic disturbance. At this stage, the researcher describes the findings as follows.

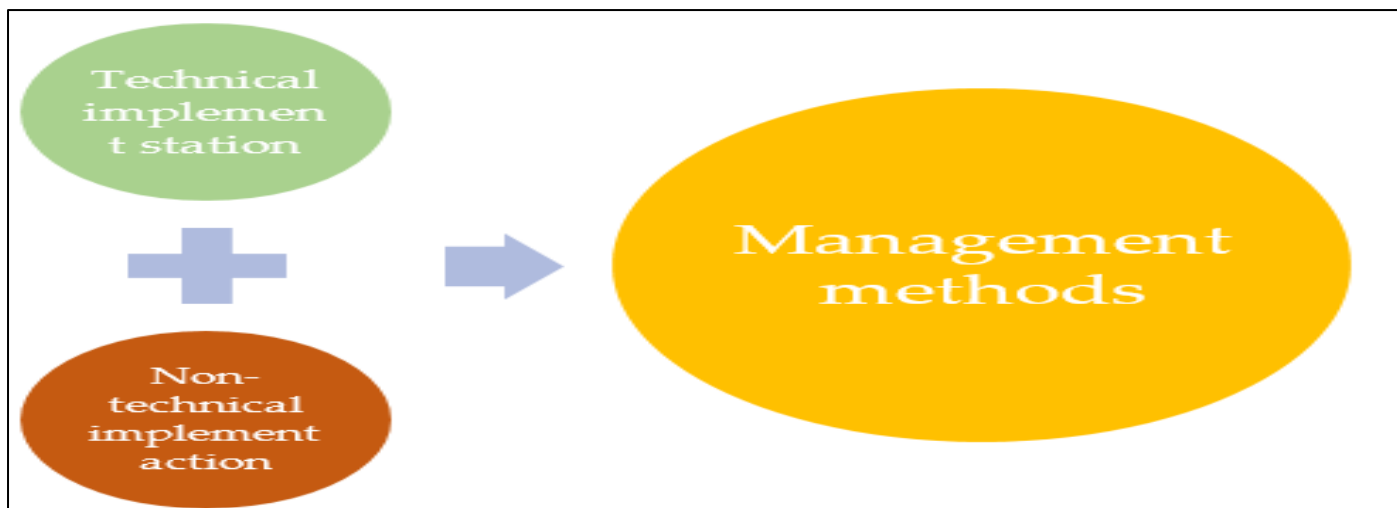


Fig 2 Implementation Findings

The explanation of the image above is the findings of the implementation factor is the management method, there is no implementation at the IPLT that manages the black water of Gorontalo city, and at the IPAL that distributes grey water that occurs only drainage channels and the construction of toilets in the Gorontalo city community, in the non-technical implementation that occurs a lot of waste that occurs in wastewater that is discharged into rivers, lakes, seas and on the ground. So that there was a gas eruption caused by black water, in the city of Gorontalo, causing the environment to be polluted.

#### ➤ Evaluation

The impact of IPAL and IPLT has not been felt so far because. The construction carried out by PU has no implementation process and only wastes the budget because the building is not well maintained, it has a bad effect on the surrounding environment because there is a lot of garbage, which is scattered as well as organizations that do not have a management structure and SOPs so that in supervising and implementing appeals to residents to be active independently in their own home environment is difficult to do. This situation can result in a situation of social discomfort in the environment around IPLT or IPAL where residents feel embarrassed because their homes smell bad when guests come to their homes. The journal states that the greater the achievement of the goals of an organization, the greater the effectiveness of the results to be achieved. (Wiliam, Rande, 2017 (Mulyatama et al., 2024))

Gorontalo city government policy number 9 of 2016 which has not been implemented effectively, because it appears that domestic wastewater management is not running as expected. Viewed from the Bottom up model, participation and support from local communities, who understand the benefits of wastewater management are very few in number, this can be seen from education and counseling to the community about the importance of domestic wastewater management not found by researchers. At the evaluation stage, this research found findings that can be seen from several indicators, namely

#### • Process

In Law Number 32 of 2009 concerning Environmental Management and Protection, supervision is part of the law enforcement mechanism. The main objective of supervision is to monitor, evaluate and determine the compliance status of the person in charge of the business and/or activity to laws and regulations in the field of environmental protection and management

(“PPLH”), environmental permits, and environmental management and monitoring obligations in environmental documents. In relation to water quality, supervision has the following important values: (1). Ensuring that control of pollutants entering water sources from certain pollutants (point sources) is carried out according to the permit, by complying with the required provisions; (2). Verifying the accuracy of self-monitoring information, testing and monitoring provided by activities and/or businesses in their reports. In the implementation process, this is difficult to do due to the lack of resources to handle this problem.

#### • Impact

Analyzing the water conditions that occur due to domestic wastewater pollution, there are several cases that occur but are indeed not significant, but sooner or later something bigger than this will definitely happen, such as. What happened due to pollution from grey water in Gorontalo City has occurred as reported on [https://dulohupa.id/semburan-air-bercampur-pasir-setinggi-20-meter-hebohkan-warga-gorontalo/#google\\_vignette](https://dulohupa.id/semburan-air-bercampur-pasir-setinggi-20-meter-hebohkan-warga-gorontalo/#google_vignette). Therefore, in analyzing the condition of domestic wastewater so that the wastewater does not pollute the surrounding environment and cause damage to the surrounding water and the surrounding environment. It is very necessary to have IPALD-T (Domestic Wastewater Management Installation, Centralized) which was built by the Gorontalo City Government. The processing and utilization of domestic wastewater is carried out. It is hoped that it can raise awareness for the community and other industrial actors. To continue to manage the domestic liquid waste produced in order to create a healthy environment and maintain sustainable environmental sustainability (Sigit et al., 2023).

#### IV. RESULTS

##### ➤ *Monitoring of Wastewater Quality*

Success is the source of the method of operating and monitoring the quality of wastewater so that in maintaining IPLT, and IPAL can run properly.

##### ➤ *Education and Counseling*

The direction of the policy for the development and development of domestic water management installations implemented by the Directorate General of Human Settlements is to increase the provision of participatory and sustainable settlement infrastructure. While the policy for the development and development of settlement infrastructure as an elaboration of the policy direction, the policy direction

must be responsive to climate change mitigation and adaptation, and be return on investment in each direction of the Sustainable Development Goals (SDG) policy,

The researcher found several interview quotes from several sources.

"In this case, the Gorontalo city area is indeed lacking in managing domestic wastewater, it can be categorized as failing to manage domestic wastewater, which is said to be successful only PDAM, only what is managed is river water into clean water"

From the evaluation stage, the researcher describes the following.

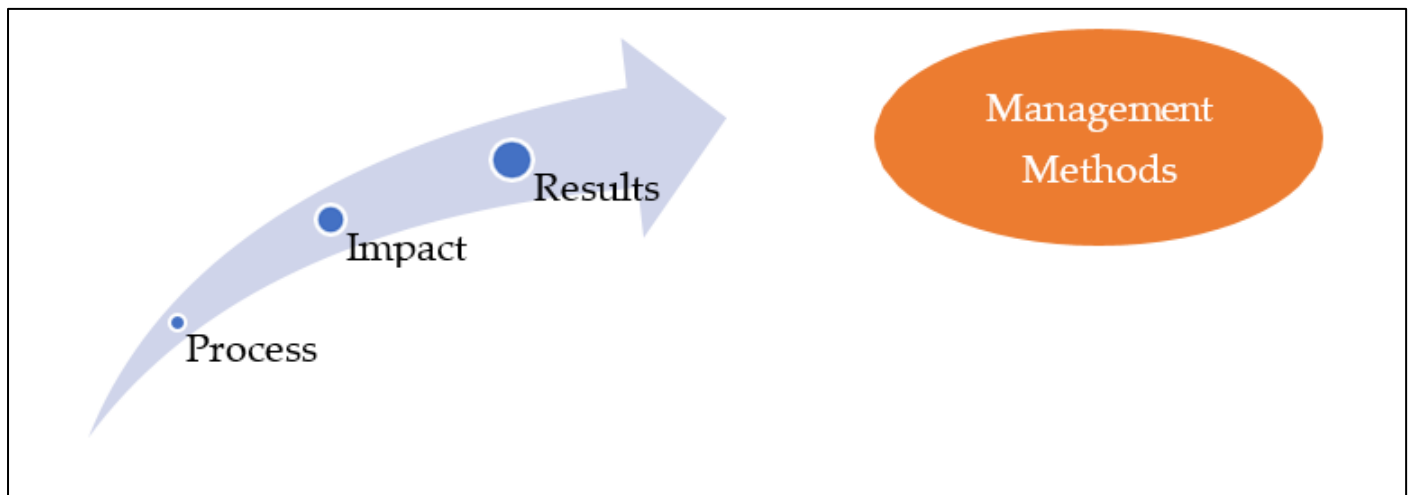


Fig 3 Evaluation Findings

From the figure above, it is shown that the Implementation of Domestic Wastewater Management Policy Analysis in Preserving Environmental Functions in Gorontalo City in the evaluation stage requires a correct management method so that the implementation process of IPAL and IPLT can run as expected.

#### V. DISCUSSION

Stakeholder participation is an important component of sustainability that has not been universally applied in the planning, implementation and evaluation of domestic wastewater system design. The importance of timely stakeholder participation in decision-making is not unique to the wastewater industry, and has been recognized

As a key component of socio-technological planning and design methodology. In natural resource management and sustainability projects (Guest et al., 2009)

At the stage of domestic wastewater policy in improving the quality of environmental management in the city of Gorontalo, Brian W. Hogwood and Lewis A. Gunn discussed several points that must be considered in this wastewater management, including.

##### ➤ *Planning*

According to Dimock & Dimock (1984: 117), administrative science consists of knowledge about what to do and how to do it. Therefore, in the implementation of public policy (politics). In the first phase that must be done by the administrator in each administrative unit is to determine the goals and objectives of the plan. Then based on the results of the policy formulation analysis, an internal administrative policy is determined in such a way that the goals and objectives that have been set can be achieved as well as possible. (Seidman, 1994). Based on the policies that have been determined, planning is carried out. The plans that are formulated are the results of the elaboration of policies and various decisions that have been taken. Determination of goals, targets, and preparation of these plans are in accordance with the affairs (tasks) that are the responsibility of each administrative unit. Furthermore, the plans that have been prepared are further described in operational programs.

##### ➤ *Program Planning*

The preparation of a program on the importance of domestic wastewater management is a planned effort or activity in the environment that is needed for the decision-making process on the implementation of a business or activity, without a good system of arrangement and management of domestic wastewater. it will have an impact on pollution and decreased environmental water quality in the



long term. Before building a septic tank and up-flow filter treatment, a survey is needed at the planning stage to ensure that the system built can function properly. The survey is carried out by observation, interviews and direct measurements in the field. The survey should be carried out at an agreed time, so that you can meet directly with the homeowner who understands the condition of the house, such as knowing the pipe route, location of the septic tank/fecal disposal and so on (Arianto et al., 2016)

#### ➤ *Technical Planning*

Judging from the IPLT building that does not have a landscape plan so that the water that flows does not match the plan, and the most important thing is that there are no technical implementers for the field, there are only honorary workers who operate the septic tank suction water, there are no technicians working on the IPLT. In the city of Gorontalo there is no IPALD- T (Centralized Domestic Wastewater Treatment Plant) so this is a very difficult obstacle in managing Grey water. Many developing countries tend to imitate the systems and technologies of industrial countries by adopting centralized wastewater treatment systems and treatment technologies such as activated sludge or tertiary nutrient removal (Nayono, 2010).

And in terms of non-technical. The decline in water quality in receiving water bodies such as rivers, seas and lakes will cause several problems such as damage to the ecological balance in the river flow, health problems of the population who use the water so that the health of the community decreases and the death rate increases. Based on previous research, it can be synthesized that: River water pollution occurs due to the disposal of waste containing organic and inorganic substances into water sources which causes various diseases and river shallowing and has an impact on the environment. (Saefudin et al., 2019).

#### ➤ *Budget Planning*

limited funds and competition with other development sectors, wastewater management usually occupies a low priority. Even if there are wastewater management efforts, due to the lack of basic knowledge and mastery of technology, many developing countries manage their wastewater by imitating the concept and technology of wastewater management from developed countries (Nayono, 2010).

Things that affect domestic wastewater management do not occur. Due to the lack of budget, which is given for planning. Domestic wastewater management is very small. So that understanding for policy planning from top to bottom is very difficult to do.

#### ➤ *Implementation*

Research data obtained by researchers in the city of Gorontalo, many people feel unimportant or trivialize wastewater management, there are also people who feel that it is the responsibility of the government, there are also people who even though the Gorontalo city government has issued policy number 9 of 2016, it is emphasized that everyone who does business and/or activities is obliged to provide correct

and accurate information regarding the implementation of domestic wastewater management obligations. Water pollution control, In order to control water pollution as required above, everyone is required to take steps to prevent water pollution, including the following:

#### ➤ *Technical*

In the theory of A. Sabatier and Daniel Mazmanian, several elements are explained to explain the consistency of objectives, sufficient resources, support and compliance from stakeholders, social and economic conditions that support the success of domestic wastewater management (Umami, 2012). Technically, the implementation of domestic wastewater management is to reduce pollution. A very effective step in preventing water pollution is prevention from sources of waste accumulation. The implementation of regulations and the determination of appropriate land use and prevention of erosion are concrete steps in reducing the level of surface water pollution due to the overflow of solid materials from land along the river or other surface water sources. While in the industrial sector, we know clean water production technology, namely the application of techniques and management that reduce the occurrence of liquid waste by using and replacing production materials with materials that allow the production of waste as little as possible, changing the core production process and supporting processes into processes that use technology or methods that can reduce the occurrence of waste, and if waste has already been produced, the steps taken are to reuse it (reuse), recycle the waste into materials for other activities (recycle).

Waste reduction steps from the source will have a very significant impact on the generation/production of wastewater by means of. Referring to SNI 03-2398-2002 concerning the planning of septic tanks with infiltration systems, the definition of a septic tank is a room that functions to accommodate and process household wastewater with a slow water speed, thus providing an opportunity for sedimentation of solid suspensions, and an opportunity for the decomposition of organic materials by anaerobic organisms to form water-soluble materials and gases. Household wastewater is all types of household wastewater originating from bathing, kitchens, washing and toilets. (Arianto et al., 2016).

#### ➤ *Non-Technical*

##### • *Health*

This study also found that one of the causes of the failure of the sanitation program in Gorontalo was the lack of integration between sanitation policies and environmental health programs. From a social perspective. Although it is known that diseases caused by grey water and black water wastewater pollution have not been exposed by the media. And there is no data showing an increase in diseases caused by grey water and black water wastewater pollution.

##### ➤ *Economy,*

This study found that the high cost of building and maintaining wastewater treatment plants is one of the factors that hinders the sustainability of sanitation programs. Local

governments often face difficulties in allocating sufficient budget for sanitation projects, especially amidst fiscal constraints. As a temporary solution, the government relies on assistance from the central government and international organizations to fund the construction of new wastewater treatment plants. However, without ongoing financial support, wastewater treatment plants that have been built tend to be abandoned or not operating optimally.

➤ *From the Social Aspect,*

This study found that the neglect of sanitation service facilities and infrastructure occurred in the city of Gorontalo. Low-income communities, especially those living in hilly and suburban areas, often do not have adequate access to proper sanitation facilities. Many of them still use traditional waste disposal systems that do not meet health standards, which ultimately have a negative impact on their health and quality of life. This inequality needs to be addressed immediately with more inclusive policies based on the needs of the local community.

➤ *Evaluation*

The evaluation obtained by the researcher is that this system is carried out for handling domestic waste in areas that are less feasible for centralized or individual system services. This is reinforced by the journal about. This handling is carried out in some areas of the city, where each house that has a private MCK connects the wastewater pipe to the wastewater piping system which is then channeled to the IPAL. A small system can accommodate waste from 2-5 houses, while a communal IPAL system can accommodate waste from 10-100 houses or more, the final result of which can be returned directly to the river. The communal system was built from the beginning with the aim of serving groups of households in villages that did not allow residents to build private septic tanks in their respective homes (Ayatulloh Repa Dipanegara et al., 2024)).

However, the researcher narrowed down this evaluation model which was divided into several stages as described in the following table:

- *Process*

Technically, the domestic wastewater management process is reviewed considering that the technological capability in water management is very limited, or for the purpose of avoiding the effects of damage and disruption of installations or equipment related to the intended use of water. The toxicity of the effects is reviewed in order to avoid the occurrence of toxic effects on humans so that water pollution occurs, wastewater pollution intended in relation to the possibility of water pollution by a substance does not occur. From this it can be said that in the process of identifying the problems that occur, there is no implementation process, program or reporting, in domestic wastewater management, so that nothing can be produced in this case.

- *Impact*

Health, health can be a consideration in setting standards to avoid adverse impacts on health, so that protection is needed, protection intended to avoid or protect against the possibility of contamination that causes bad effects on the body. In aesthetics, there is no comfort and beauty. From the collection of information to assess the impact of this policy evaluation model for improvement, it can be replaced by other more competitive methods so that the achievement is better and maximum.

## VI. RESULTS

In the economic element, factors are considered in order to avoid economic losses can be seen from the creation of IPAL and IPLT like throwing away a budget that is not utilized properly. On the other hand, what should be created is IPALDT (Centralized Domestic Wastewater Management Installation). While in the city of Gorontalo does not have IPALDT. And also there is no observation of IPAL and IPLT, to get results that can be used, so researchers pour out additional ideas about the management methods outlined in policy number 9 of 2016. So that it can be understood by government managers and the community.

From the results of the study on the Implementation of Domestic Wastewater Management Policy Analysis in preserving Environmental Functions in Gorontalo City, researchers found that each indicator is a management method, so this management method needs to be carried out by the Gorontalo government, namely the domestic wastewater management method explained in policy number 9 of 2016.

## VII. CONCLUSION

➤ *Planning*

In the IPAL and IPLT development planning program, it must be clear and understandable by the cadres because it will be a very important existence, technical planning using very effective steps in preventing water pollution is prevention from sources that cause wastewater. Implementation of regulations and determination of appropriate land use and prevention of erosion are concrete steps in reducing the level of surface water pollution due to the overflow of solid materials from land along the river or other surface water sources. In budget planning, the budget for wastewater management is still very low so that it cannot cover all wastewater management activities.

➤ *Implementation*

Waste reduction measures from the source will have a very significant impact on the generation/production of wastewater. To overcome this wastewater problem, prevention efforts are needed so that wastewater pollution does not occur, therefore proper and safe wastewater management infrastructure is needed so that people can live healthily and comfortably. The inadequacy of the legal regulations needed in the residential wastewater management system and the weak enforcement of the law against violations of regulations related to domestic wastewater

pollution. The discussion about Health is the relationship between infrastructure that is still not good and proper so that it affects public health. In terms of the government environment, it is seen that the knowledge and behavior of the community do not really understand about wastewater management, so that wastewater management is neglected. The areas that are often affected are the communities on the banks of the river.

#### ➤ Evaluation

In the process of implementing wastewater management, there are still obstacles here and there due to lack of knowledge about wastewater management. A very effective step in preventing water pollution is prevention from sources that cause wastewater. Implementation of regulations and determination of appropriate land use and prevention of erosion are concrete steps in reducing the level of surface water pollution due to the overflow of solid materials from land along the river or other surface water sources. There is low public access to the provision of adequate basic sanitation, then the low level of wastewater treatment services in the city of Gorontalo and wastewater treatment facilities that do not meet the established technical standards. In addition, increasing accessibility of technology and steps can be taken to increase the accessibility of environmentally friendly technology in water management for energy. This could involve increasing support for research and development, reducing technology costs through economies of scale, or developing procurement policies that facilitate the procurement of new technologies by the government or private sector. With the knowledge of proper wastewater management methods. Can reduce the value of domestic wastewater pollution in the living environment, recognize the ecological system, balance environmental sustainability.

### REFERENCES

- [1]. Afifah, T., Nuryetty, M. T., Cahyorini, Musadad, D. A., Schlottheuber, A., Bergen, N., & Johnston, R. (2018). Subnational regional inequality in access to improved drinking water and sanitation in Indonesia: results from the 2015 Indonesian National Socioeconomic Survey (SUSENAS). *Global Health Action*, 11(1). <https://doi.org/10.1080/16549716.2018.1496972>
- [2]. Arianto, E., Ruslan, A., Umayah, U., Lestari, A., Baharudin, I., & Adinugroho, E. (2016). Sistem Pengelolaan Air Limbah Domestik - Setempat Tangki Septik Dengan UP- FLOW Filter. *Sistem Pengelolaan Air Limbah Domestik*, 58.
- [3]. Ayatulloh Repa Dipanegara, Angelina Cahya Pramesti, Angelina Cahya Pramesti, Azka Dwi Yuniar, Louis Anasthasya Christyadi, Rinanda Putri Utami, & Andhina Putri Heriyanti. (2024). *Kajian Aspek Ekonomi Dan Kelembagaan Dalam Keberlanjutan IPAL Komunal di Kelurahan Jatirejo Kota Semarang*. 85–92.
- [4]. Dutta, A., Talmadge, M., Nrel, J. H., Worley, M., Harris, D. D., Barton, D., Groenendijk, P., Ferrari, D., Chemical, B. S. D., Searcy, E. M., Wright, C. T., & Idaho, J. R. H. (2011). *Process Design and Economics for Conversion of Lignocellulosic Biomass to Ethanol*
- [5]. Endah. (2022). Metodologi Penelitian Kualitatif. In *Metodologi Penelitian Kualitatif*. In Rake Sarasin (Issue Maret). <https://scholar.google.com/citations?user=O-B3eJYAAAAJ&hl=en>
- [6]. Guest, J. S., Skerlos, S. J., Barnard, J. L., Beck, M. B., Daigger, G. T., Hilger, H., Jackson, S. J., Karvazy, K., Kelly, L., Macpherson, L., Mihelcic, J. R., Pramanik, A., Raskin, L., Van Loosdrecht, M. C. M., Yeh, D., & Love, N. G. (2009). A new planning and design paradigm to achieve sustainable resource recovery from wastewater. *Environmental Science and Technology*, 43(16), 6126–6130. <https://doi.org/10.1021/es9010515>
- [7]. Mulyatama, B., Anshari, G. Z., & Gusmayanti, E. (2024). Evaluasi Kinerja Kelompok Kerja Masyarakat Berbasis Komunitas dalam Mengelola Instalasi Pengolahan Air Limbah (IPAL) Komunal di Kota Singkawang. *Jurnal Ilmu Lingkungan*, 22(4), 1054–1066. <https://doi.org/10.14710/jil.22.4.1054-1066>
- [8]. Nayono, S. E. (2010). Metode Pengolahan Air Limbah Alternatif Untuk Negara Berkembang. *Inersia*, 6(1), 52–64.
- [9]. Saefudin, A., Nadiroh, & Achmad, R. (2019). Policy implementation evaluation about quality management and pollution control of water in Regency of Bekasi. *IOP Conference Series: Earth and Environmental Science*, 314(1), 012087. <https://doi.org/10.1088/1755-1315/314/1/012087>
- [10]. Seidman, H. (1994). Dimock's philosophy of administration. *International Journal of Public Administration*. <https://doi.org/https://doi.org/10.1080/01900699408524979>
- [11]. Sigit, P., Sitogasa, A., Kurniawati, E., & Novembrianto, R. (2023). Sistem Pengolahan dan Pemanfaatan Air Limbah Domestik ( Studi Kasus Pada PT . X ). *Sains*, 4.
- [12]. Susanthi, D., Yanuar Purwanto, M. J., Suprihatin, D., Studi Pengelolaan Sumberdaya Alam dan Lingkungan, P., & Pascasarjana, S. (2023). *Strategi Pengelolaan IPAL Komunal Perkotaan Berkelanjutan di Kota Bogor*. 1–15.
- [13]. Tachjan, H. (2006). *Implementasi Kebijakan Publik*. AIPI Bandung.
- [14]. Ulya, A. Z., Amalia Juwita Hasri, Ahmad Berezky, Dian Rosadi, & Yohanesy Agrees Melsa. (2023). Program Saluran Pembuangan Air Limbah (SPAL) Sebagai Upaya Dalam Peningkatan Sanitasi Lingkungan. *KREATIF: Jurnal Pengabdian Masyarakat Nusantara*, 3(2), 91–100. <https://doi.org/10.55606/kreatif.v3i2.1480>
- [15]. Umami, M. I. dan. (2012). Implementasi Kebijakan (Teori Sebatier & Mazmanian). *Riezlioko*. <https://riezlioko.wordpress.com/2012/01/27/implementasi-kebijakan-teori-sebatier-mazmanian/>