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The Role of Youth as Non-State Actors in Providing Clean Water and Adequate Sanitation in the Tebas River Based on Quadruple Helix

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ABSTRACT

For many years, the Tebas River has been the lifeblood of the community in Tebas Kuala Village and Tebas Sungai Village, Tebas District, Sambas Regency, West Kalimantan Province, Indonesia. However, as the population increases, industrial areas and technological developments affect the condition of the river water. Currently, the Tebas River water is starting to be polluted by waste from households and small industries with the presence of E. Coli bacteria due to the continued use of plunge toilets, which has the potential to cause diarrhea. This article aims to analyze the role of youth as non-state actors in providing clean water and adequate sanitation in the Tebas River. The method used in this article is descriptive qualitative with data obtained from observation and literature study. The research results found that stakeholder handling is needed through quadruple helix synergy, namely from government, society, industry, and academia. This management synergy also supports the achievement of the 2030 Village SDGs, especially in point 6, namely Clean Water and Sanitation. In conclusion, this initiative discusses protecting the Tebas River for both the present and the future generations.

Keywords: *Non-State; Quadruple Helix; Rivers Sanitation; VSGDs; Youth*

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INTRODUCTION

Water conservation does not only talk about seas and beaches, but also waters on land such as lakes, swamps, and rivers. Rivers are waterways that play a very important part in the water cycle, namely as drainage channels for surface water. According to Law of the Republic of Indonesia Number 11 of 1974 concerning Irrigation, the function of rivers is as irrigation, a source of raw water for drinking, industry, and macro drainage. Rivers are also home to wildlife which is an important part of our rich natural heritage.

Rivers are also a great place for us to interact and enjoy the nature around us, and can even be a source of renewable energy. Rivers are used as new and renewable energy using large flow rates and many waterfalls. This condition can be used as a hydroelectric

power plant. Large and long rivers have the potential to be developed for generating electricity. Meanwhile, smaller rivers can also be developed for mini-hydro and micro-hydro. The availability of sustainable water discharge in a certain capacity is very necessary in the development of hydro energy. For this reason, river watersheds (DAS) must be preserved and not experience environmental degradation and damage due to changes in land cover and reduction in forest areas in upstream areas.

As a maritime and archipelagic country, Indonesia has many rivers, including in West Kalimantan Province. In this province, rivers have since ancient times functioned as a means of transportation (waterway), rainwater storage, tourism, and cultural activities, floating markets, sources of irrigation for agriculture, sources of water for daily needs (cooking, bathing, sanitation, to consumption), to as a source of livelihood from natural products such as fish content and so on.

The vitality possessed by rivers makes maintaining the quality of its waters very important. Rivers that are not clean, let alone contaminated with chemicals, of course not only hinder their functions but can also cause various types of diseases that impact river ecosystems, flood disasters, and human health. River water can be categorized as polluted if it experiences changes in physical, chemical, and biological parameters. In terms of physical parameters, the things observed are temperature, color, smell, taste of water, current speed, depth, and river substrate content. Chemical parameters, namely by looking at the degree of acidity (pH), dissolved oxygen gas content (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), and total suspended solid (TSS). Biological parameters can be seen through the abundance of gastropods, microalgae, annelids, and phytoplankton.

However, unfortunately, currently, rivers in Indonesia are in a worrying condition. As many as 25.1% of rivers in Indonesian villages have poor quality. In West Kalimantan Province alone, 236 villages have been affected by heavy pollution so the water quality is very poor. This province is the third province whose rivers are contaminated at quite high rates as can be seen in the following picture.

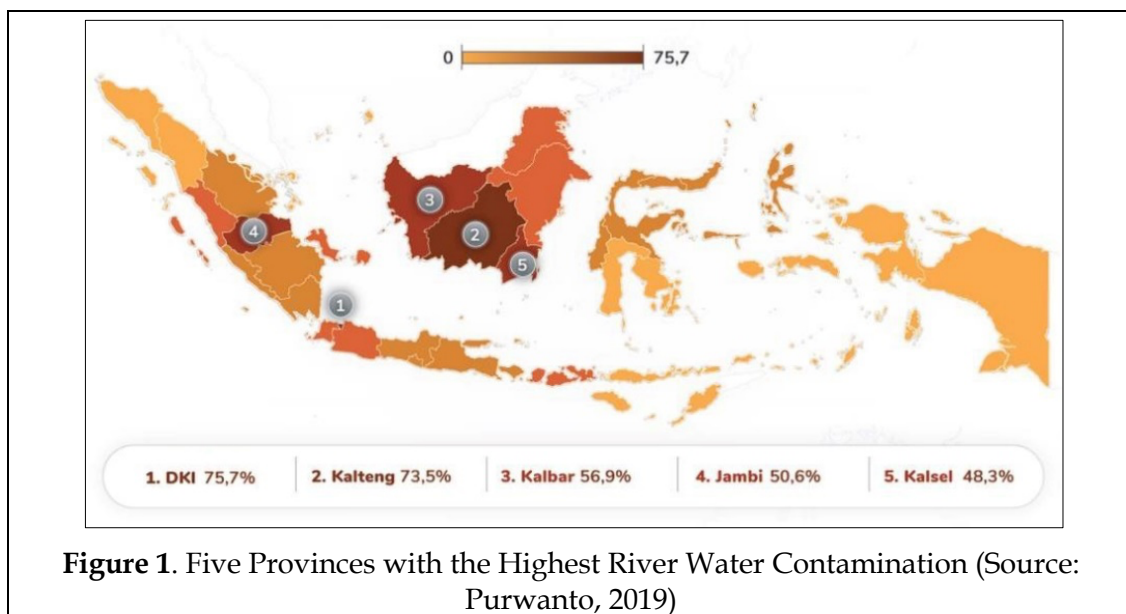


Figure 1. Five Provinces with the Highest River Water Contamination (Source: Purwanto, 2019)

In this study, it was also found that the materials polluting rivers in West

Kalimantan were factory waste at 7.5% and other waste at 10.6%. Damage to river quality is caused by several factors such as population growth, economic development, conflicts of interest, exploitation of natural resources, and waste arising from community activities. Waste in this category can come from rubbish thrown directly into rivers as well as from bathing, washing, and toileting activities. According to the Ministry of Health of the Republic of Indonesia, many Indonesians still do not dispose of feces properly. As many as 34 million people still throw it away carelessly, especially people who live in riverbank areas (Sari, 2019).

Toilets are sanitation facilities that have now become a basic need that every family and public facility must have. However, there are still many people in villages who traditionally use rivers for bathing, washing, and toileting activities which generate waste from detergents, soap, and human waste. This habit is certainly unhealthy for human health and can have an impact on the environment. This bad behavior can cause rivers to be polluted by feces that carry *Escherichia coli* (*E. coli*) bacteria. If it contaminates humans, the bacteria can cause diseases such as diarrhea.

This is also what happened to the Tebas River. This river is the heart of life for the people of Tebas Kuala Village and Tebas Sungai Village in Tebas District, Sambas Regency, West Kalimantan Province. This sub-district has 23 villages with Tebas Kuala Village as the largest village, namely 3.68 km² (Badan Pusat Statistik Kabupaten Sambas, 2021). It was observed that the river was lightly polluted by household waste because the community still used the river as a household waste disposal facility and people who lived on the banks of the river still used plunge toilets.

In several previous studies in case studies in South Sumatra, it was stated that the reason people continued to use plunge latrines even though the community's life was modern was that they felt practical and economical. *Cemplung* latrines mean that people do not need to build septic tanks or sewage tanks. Water for cleaning feces can also practically be taken directly from the river and there is no need to flush the feces that have been thrown away because they are immediately carried away by the river water currents (Harapan, 2019).

The availability of clean water and adequate sanitation for village communities is interrelated with the strength of the nation's competitiveness. If the water source is not clean and sanitation is inadequate, then people in the village need more funds to go for treatment because sanitation is unhealthy, and have to buy water to get clean water. This is part of the Village Sustainable Development Goals (Village SDGs). Village SDGs are the application of SDGs by focusing on villages as the object of development.

The choice of village as the focus is not without reason. If the SDGs on village development are successfully implemented, then 74% of the total SDGs achievement will have been achieved (Iskandar, 2020). Measuring the achievement of the Village SDGs is by looking at indicators, namely the achievement of households with 100% access to clean water and proper sanitation, the efficient availability of drinking water, and the movement to protect water resources including ecosystems in rivers (Village SDGs, 2020).

The problem of water in the Tebas River which is lightly contaminated by feces generated from pit latrines is an aspect of the study of point 6 of the Village SDGs, namely sustainable Clean Water and Sanitation. However, this problem is also related to other points, such as point 3, namely Good Health, and point 14, Life Below Water.

This is said to be interrelated because, with the provision of clean water and proper sanitation, the potential for disease and polluted water ecosystems can be avoided.

METHODS

Since the final data is realized as textual information or descriptive narratives, a qualitative approach is used. Data collection methods for qualitative descriptive research often include focus groups, interviews, observations, and other methods. Coding, categorization, and other techniques are then used to analyze the data (Purwanto, 2016). Researching the library or literature is the focus of literary research, which is another name for library research and direct observation by researchers. In this research, the research process involves exploring research that has similarities or relevance regarding the role of youth as non-state actors in providing clean water and adequate sanitation in the Tebas River based on quadruple helix with data sourced from observations and literature studies.

RESULT AND DISCUSSION

More than half of the world's population lacks access to safe sanitation services, according to a recent report on disparities in access to water, sanitation, and hygiene. Even though there has been significant progress in expanding access to sanitary facilities and clean drinking water, billions of people – mostly in rural areas – continue to lack these necessities. Globally, over 673 million people still practice open defecation, two out of every five people lack access to a basic handwashing station with soap and water, and one in three people lack access to safe drinking water (who.int, 2019).

As the country with the fourth largest population in the world, sanitation conditions in Indonesia are still classified as inadequate. Not just the government, not just society, but all parties are responsible for addressing the current sanitation conditions in our country. The various conditions described above make it clear that several problems need to be addressed immediately included in this on sanitary restrooms. Using sanitary restrooms with waste that is cleaned and properly disposed of, as well as consuming water from sources that are on-site, uncontaminated, and available when needed.

This also happens in Indonesia and in this case study on the Tebas River. Currently, the condition of the Tebas River is lightly polluted due to household waste being thrown directly into the river and contamination from human feces. People in Tebas Village who live on the river tend to choose to use pit latrines with direct discharge into the Tebas River. The condition of the Tebas River can be seen in the following picture.



Figure 2. Condition of the Tebas River (Source: Researcher documentation, 2022)

As a result of the pollution of the Tebas River, it is now very rare to find fishing activities in the river. People usually look for fish in the Kuala area, namely in the Sambas Besar River (Perigi Piyai Pier, Tebas District). Apart from that, water from the Tebas River cannot be consumed. Even though the location of the two villages is not isolated and the infrastructure and roads are getting better and smoother. Allegedly, people continue to use plunge latrines because they are used to it and it is a culture that has been carried over by their families for a long time.

Facing the problem of Tebas River water which is lightly polluted due to fecal waste from plunge latrines is basically in line with efforts to provide clean water and proper sanitation for the community in Tebas Kuala Village and Tebas Sungai Village. This handling and efforts cannot be carried out only with the role of one party but requires synergy from multi-actors such as government, industry, academia, and society, which is called the quadruple helix (Hasche, Höglund, & Linton, 2020). This collaboration can be seen in the following chart.

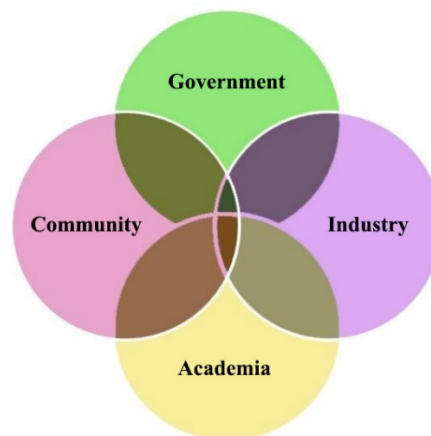


Figure 3. Quadruple Helix Synergy (Source: Processed by researchers, 2023)

For each actor in this quadruple helix, youth can contribute to efforts to resolve this problem. Why youth? More than half of the world's population today are youth

(people aged 16–30 years). Likewise, in Tebas Kuala Village and Tebas Sungai Village. Young people play an important role in finding solutions to ensure sustainability in local and global policies. Today's youth are the generation that has the best opportunity to support the achievement of Village SDGs, including efforts to realize clean water and proper sanitation on the Tebas River in Tebas Kuala Village and Tebas Sungai Village.

1. Government Policy (Government)

The government policy emerged because of problems felt by the community, in this case, the need for clean water and proper sanitation for the people of Tebas Kuala Village and Tebas Sungai Village whose water needs depend on water from the Tebas River. From a political perspective, the government, in this case starting from the village government, is required to fulfill the 6th goal of the SDGs.

David Easton's systems theory is a simple way to look at a political system from policy proposal to implementation and feedback and its impact on society (DG, 2023). The implementation of the system model for the Tebas River pollution problems can be seen more clearly in the following picture.

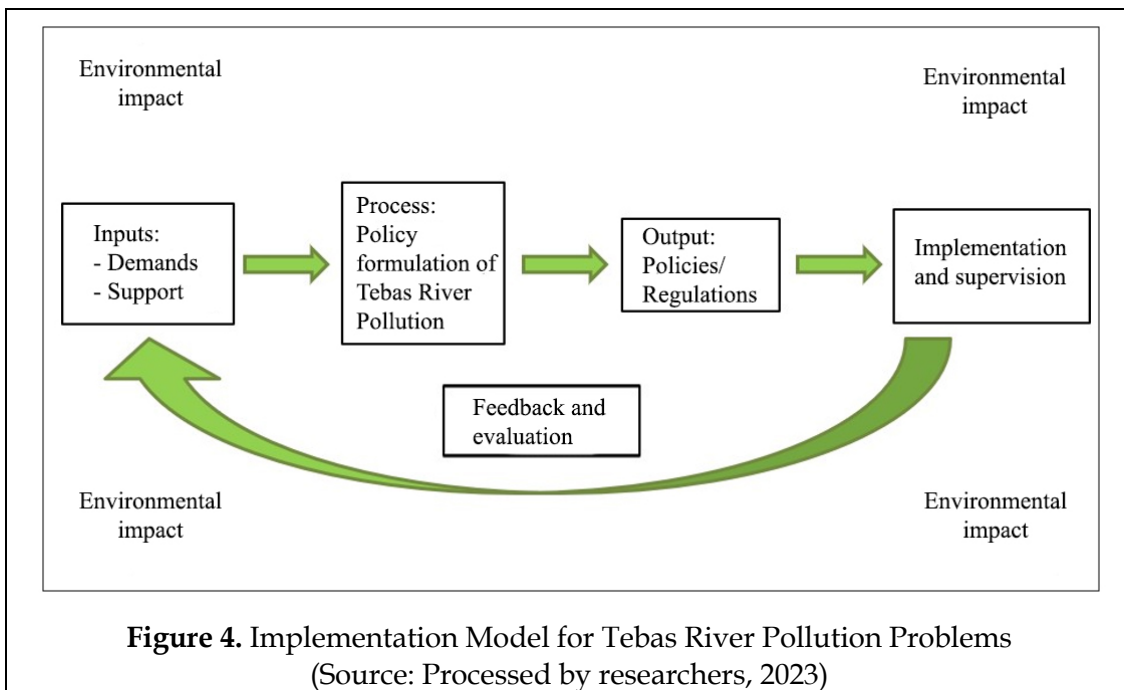


Figure 4. Implementation Model for Tebas River Pollution Problems
(Source: Processed by researchers, 2023)

A healthy toilet or latrine that supports proper sanitation does not pollute the water either in the river or on the ground. Other indicators are that it has good air ventilation, has walls and a roof as protection, sufficient lighting, is easy to clean, and the floor is watertight. Therefore, a program from the government through villages is needed, namely the provision of well-sanitized toilets, for example through the Village Sanitation Assistance Program. Apart from that, the government also needs to strengthen regulations regarding the prohibition of pit latrines.

The participation that young people can do in this case is by monitoring government policies. Starting from conveying aspirations (input), being actively

involved in the policy formulation and implementation stages (process and output), to providing feedback to support the sustainability of policies issued by the government.

Currently, the government's policy that is being implemented to overcome the problems in the Tebas River is the project of dredging and widening the shallow river, namely through the normalization of the 6,000-meter-long Tebas River through funds from the 2020 State Revenue and Expenditure Budget at the Ministry of Public Works and Public Housing. Of course, this is also a good step to support spatial planning and areas that are more river-friendly in the future so that we can stop the use of pit latrines on the banks of the Tebas River in the future.

2. Contribution of the Industrial Sector (Industry)

Changing the community culture from using pit latrines to toilets that have septic tanks requires support from various parties, including the industrial or business sector. The type of toilet or latrine that meets the criteria for proper sanitation is in the form of a gooseneck toilet and is equipped with a final waste management area or wastewater treatment plant. Industry can play a role in providing these facilities with support from the government.

Apart from that, the industrial sector itself must also support the control of fecal waste which is dumped directly into the Tebas River water by controlling shops that have plunge latrines in them. The need for active participation from the industrial sector has been regulated in Government Regulation Number 20 of 1990 concerning Water Pollution Control, and Minister of the Environment Regulation Number: Kep-51/Menlh/10/1995 concerning Quality Standards for Liquid Waste for Industrial Activities (Atima, 2015).

If the industrial sector develops fecal waste management, it can certainly bring economic value not only to industry but also to society. This management includes processing feces into compost, biogas, and the like. Compost fertilizer can be used by farmers who make up majority of livelihoods in Tebas Kuala Village and Tebas Sungai Village. Biogas is an alternative fuel to replace kerosene and gas derived from petroleum, which of course is not a renewable material. Therefore, biogas can reduce the output of methane gas (CH₄) emissions thereby supporting Village SDGs in point 13, namely Climate Action. Youth participation, in this case, is that they can take part in supporting educational and training steps in making compost and biogas fertilizer as well as by developing themselves as young entrepreneurs who support the sustainability of the Village SDGs.

3. Academic Role through the Tri Dharma of Higher Education (Academia)

The role of academics in overcoming the problem of providing clean water and adequate sanitation will provide added value to society (Mishra, Kumar, Saraswat, Chakraborty, & Gautam, 2021). Academics in higher education have three main functions contained in the Tri Dharma of Higher Education, namely education and teaching, research and development, and community service. The first function is education and teaching, academics, both lecturers and students, have the task of forming people who are responsible for the welfare of society. Various scientific disciplines can be connected to the problems faced by the Tebas River. Such as majors in environmental engineering, chemistry, environmental health, and majors that are not directly related to river quality monitoring but have connections to sociology, politics, and so on.

Research and development are carried out by academics to analyze a problem in more depth to produce innovations needed in efforts to provide clean water and adequate sanitation (Kabir, Roy, Begum, Kabir, & Miah, 2021). The results of this research can not only be used to develop the quality of education and more effective teaching but also provide scientific contributions to society.

In the community service function, lecturers and students as youth can carry out educational activities. Education related to changing people's behavior and mindset so that they switch to healthy, sanitized latrines rather than pit latrines is the main and first thing that needs to be done. If it has been facilitated, but the individual has not received a good education, then it will only be a wasted effort. The role of academics through this function also supports increasing the capacity of human resources in terms of the availability of clean water and adequate sanitation so that they can support the Village SDGs.

4. Participation of Village Communities and Youth (Community)

Particularly, youth participation is most visible through community actors. Youth can play a role through Youth Organizations, Environmental Care Communities, Scout Movements, Non-Governmental Organizations, and even as communities themselves. The main things that can be done are carrying out regular education so that people can understand more about cleanliness or sanitation and providing clean water, supporting facilitators in making well-sanitized latrines, and educating on managing fecal waste into compost and biogas.

These activities are packaged into interesting and recreational activities by the spirit of youth. Some ideas that can be implemented include holding a healthy toilet competition for each hamlet, a competition to make educational posters for school children, and holding a water festival to commemorate World Clean Water Day (Nelson, Drabarek, Jenkins, Negin, & Abimbola, 2021). The role of the community is highly expected to overcome the current water crisis. The water crisis is not only a problem of water quantity but also the quality of water for consumption (Wang, Zhang, Lv, Zhang, & Ye, 2018). Public awareness about not polluting water sources needs to be increased.

Apart from direct outreach activities to the community, young people who are currently very familiar with advances in technology and the internet can certainly make other innovative efforts digitally. Youth activities on social media can be utilized positively, for example by creating educational platforms for clean water and proper sanitation on social media such as Instagram, Facebook, Tik Tok or YouTube, which are currently very popular with the public, especially young people in Indonesia. It is hoped that direct education and virtual spaces like this can increase the effectiveness of the youth's role in contributing to supporting the Tebas River without being polluted by fecal waste from plunge latrines.

CONCLUSION

The availability of clean water and adequate sanitation is a human right. Water is a basic need for life. Access to safe and clean water is essential for human survival. Unfortunately, until now many people in various countries still lack water, which is predicted to get worse in some areas as a result of climate change and population growth. Not only that, there are still many people who use drinking water sources contaminated with feces. Microbial contamination of drinking water as a result of fecal contamination will make the water unfit for consumption because it will pose a health

risk including the people in Tebas Kuala Village and Tebas Sungai Village, still need more attention to support efforts to preserve the Tebas River.

The river, which is the heart and artery of daily life, is still in the shadow of light pollution due to fecal waste from pit latrines which are still widely used by the community. Today's youth have a very big role in efforts to solve these problems. Moving together synergistically through the quadruple helix, youth can contribute to supporting government, industry, academia, and community actors. Management of clean water and proper sanitation in Tebas Kuala Village and Tebas Sungai Village also supports the achievement of the 2030 Village SDGs, especially in point 6, namely Clean Water and Sanitation.

Managing water and sanitation sustainably is also in line with improving the welfare of village communities from economic, health, and ecosystem sustainability aspects. This effort not only talks about saving the Tebas River for now but also for future generations. Overcoming the challenges of sanitation management, including handling water quality in the Tebas River, requires joint support and responsibility, starting from central and regional governments, industry, academics, and the community, in this case especially youth, as previously explained. As the generation that will fill the future of the Indonesian nation, youth have a role as non-state actors in ensuring access to adequate sanitation and water so that public health and river water sustainability can be guaranteed.

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