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Community Adaptation in Facing Environmental Pollution Challenges in the Industrial Designated Area of Lamongan Regency, East Java, Indonesia

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ABSTRACT

Industrial growth is an opportunity for economic growth, but also a challenge for the environment, especially pollution due to industrial waste. The purpose of the current research is to analyze community adaptation in facing the challenges of environmental pollution in industrial This research uses a qualitative method based on phenomenology. This study is located in is in Rejosari Village, Deket District, Lamongan Regency. The informants in this study consist of the main informant and supporting informants totaling 29 informants. Data collection included in-depth interviews, observations, and document studies. The validity of the data was tested using theoretical triangulation and source triangulation. The data analysis technique uses the interactive model of Miles & Huberman and Nvivo 12. Based on the results of the study, it shows that community adaptation involves several parties, namely the government, industry and society. The government manages and protects the environment, the industry conducts proper waste treatment plus a high level of public awareness of the environment. Collaborative Governance is used for the management of environmental pollution due to industrial waste

Keywords: Adaptation of Society, Environmental Pollution, Industry

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INTRODUCTION

Development is a social change that has been planned beforehand, including environmental insights, increasing economic progress and welfare, modernization to human resources that have good quality (Depi Pramana, 2017). Industrialization is strongly associated with the development process. The industrialization sector is expected to be able to overcome obstacles to the Indonesian economy (Hasan, 2014). The development of the industrial sector is able to become a leading sector because the industrial sector has an influence on the development of other sectors, such as the agricultural sector, the trade sector, and services (Purnamawati & Khoirudin, 2019). The industrial sector is believed by the Indonesian people to be able to improve the country's economy so that it is a necessity for industry in Indonesian territory. Based on this policy, economic growth in the non-agricultural sector is the main priority of the Lamongan Regency government (Kurniasari, M., & Ariastita, 2014). Not only that, Lamongan Regency

is one of the central areas of development for East Java, namely the Gerbangkertasusila Plus Area which faces a change in economic structure from the primary sector to the tertiary sector from 2008 to 2012 which is increasing every year (Kurniasari et al., 2014).

In 2018, according to the Central Statistics Agency of East Java, Lamongan Regency was ranked ninth out of all cities/regencies in East Java based on the number of medium and large companies in the province. There are several reasons behind investors to establish an industry in Lamongan Regency. One of them is the geographical advantage because the location of Lamongan Regency is quite close to the capital city of East Java Province, namely the city of Surabaya. This causes the easy flow of distribution of goods and services from Lamongan Regency to outside the East Java region, and moreover, access to outside the country is also quite wide open. Since 2004, there have been a number of industries approximately 21 industries operating along the Pantura road with a total investment value of Rp. 12.738 trillion. These companies include the marine tourism industry, fertilizer industry, fish processing industry, shipbuilding industry, port management services, animal feed industry, oil and gas industry, and sugar industry.

The increasing industrial development contradicts the results of research by Huda, Imam Arifa'illah Syaiful, Suwargany, Melly Heidy (2017) who explained that the carrying capacity of agricultural land in Lamongan Regency is very superior or is a first-class category. The macroeconomic condition of Lamongan based on Gross Domestic Product (GDP) that the dominant sectors are fisheries, agriculture and forestry as much as 33.86%. So that Lamongan Regency is known as the food barn of East Java because it has an agricultural area of 106,590 ha. However, the industry in Lamongan Regency has increased because it has received support from the Lamongan Regency government. Based on the results of Mustopa's research (2011), it is stated that agricultural land in the form of rice fields has a vulnerability to land conversion. As is the case in Rejosari Village, there has been a change in the use of agricultural land to industry.

There has been a change in land function in Rejosari Village from agricultural land to industrial, residential and service land. This area is an urban fairy area, which is a suburban area that experiences a combination of rural and urban. Rejosari Village is one of the villages that is famous for freshwater fisheries and even entered the second rank nationally. The industry will have an impact on physical, environmental and social conditions. Industrial activities not only have a positive impact but also have a negative impact (Nurkolis, 2015). Lamongan Regency's industrial activities have the potential for environmental pollution. The potential to reduce water quality caused by domestic activities of employees, production processes, industrial waste and other activities. However, the potential for environmental pollution is less of a concern for community members.

Based on data from the Lamongan Regency Environmental Service (DLH), there were complaints in the environmental sector, including in 2019 as many as 14 cases with the category of environmental pollution complaints 8 cases, environmental damage 3 cases, B3 waste as many as 3 complaint cases. In 2018 there were 13 cases and in 2017 there were 14 complaints. So that in 2018 there was an increase of 7.69% in environmental cases. One example of a complaint of water pollution cases includes August 22, 2019, Mr. Sutanji, a resident of Rejosari Village, Deket Ikan District, in Mr. Alim's pond, all died allegedly due to seepage from drainage channels originating from PT. Bumi Menara Internusa (BMI). The complaint is caused by waste which is one of the results of industrial

activities that can cause environmental pollution.

Environmental pollution will increase along with population growth. The existence of industrial activities has allowed the labor to be attracted from outside and settle in the vicinity, and population growth has led to the development of settlements where the quality and pattern of the environment cannot be separated from the existence of industry. Based on the Lamongan Regency RTRW, it can be clearly known that the current and future environmental problems are pollution from the activities of various sectors, especially the industrial sector. Therefore, it is necessary to give careful consideration to environmental issues and deal with them. On the basis of this gap, Lamongan Regency is a food self-sufficiency area known as the food barn of East Java because it has an agricultural area of 106,590 ha. However, it is required to improve economic growth in the non-agricultural sector, namely industry. Industrial development not only has an economic impact but also has an impact on industrial waste that can pollute the environment (Ningrum, 2019). All of this is the result of human behavior through activities that consider nature as a commodity that is needed only as a waste medium and industrial activities, even though the environment is a substance with limits that can be destroyed.

Based on the above background, it can be seen that there is a mutual relationship between society, economy and the environment. There is a relationship between the community and the environment, people need the environment as a source of life. On the other hand, the economic sector is the driving force of people's lives to continue to carry out their activities in providing goods and services. The function of the community in the economic sector is to provide manpower and institutions to drive the economic sector. In addition, there is a relationship between the environment and the economy. The environment here is a barn of Natural Resources (SDA) that is managed for economic activities. With the management of natural resources in these economic activities, it produces reciprocity in the form of impacts that affect environmental conditions. So that this is a challenge for the community to adapt to the environment that has changed due to economic activities.

METHOD

This research employed qualitative research based on phenomenology, which is a research based on phenomenological or subjective experiences experienced by an individual. This research was carried out in Rejosari Village, Deket District, Lamongan Regency. The reason for the researcher in choosing the location of this research was that the Rejosari area was an area that had undergone land change from agriculture to industry, environmental pollution due to industrial waste, and conflicts between the community and industry. Creswell (2016:4) reveals that a qualitative approach was a process of research and understanding based on methodologies to investigate and explore meanings that are considered by a number of individuals or groups of people to originate from a social phenomenon and human problem.

The researcher wanted to explain in depth about environmental pollution, as well as public awareness about environmental pollution due to waste so that community adaptation was found in dealing with environmental pollution. Researchers build assumptions based on relevant theories and previous research so that a frame of mind is formed. In proving the researcher's basic assumptions, data was collected through in-depth interviews, observations, and document studies. Before data analysis, a data validity

test is carried out first. In this study, the validity of the data was tested using source triangulation, and theoretical triangulation. This study uses three data sources, namely: informants, document studies, and phenomena. In this study, the determination of informants was carried out using the purposive sampling technique. There are certain criteria in determining informants. The informants used in this research can be seen in table 1.1.

Table 1.1 Selection of Informants

It	**Report**	**Informant Reasons for Choosing**
1	Environment Agency Lamongan Regency. a. Head of the Lamongan Regency Environmental Service b. Head of Supervision and Control c. Head of Environmental Management Division	The Environment Agency has duties and authorities, including the implementation of control and supervision of pollution and environmental damage. Among them are water quality management and water pollution control activities, air quality management and air pollution control and so on.
2	Industri PT. BMI to obtain valid and accurate data about PT BMI in waste management and what contributions the PT BMI factory provides to the people of Rejosari Village	The industry that has the most influence on environmental pollution that occurs in Rejosari Village is the PT BMI industry which producing foul-smelling air pollution and water pollution into the river causing some farmers experienced crop failure.
3	Rejosari Village Government Apparatus a. Head of Rejosari Village b. Head of the Rejosari Village Planning Section.	Rejosari Village Government Apparatus Has valid and accurate data on the opinions and complaints of the people of Rejosari Village in the residential environment
4	The community of Rejosari Village by emphasizing certain criteria In order to elaborate more in- depth including: a. Residents whose homes are close to the factory b. Residents whose ponds are close to the factory	Because this community is right near the industry that has been in the industrial environment for a long time so that they know the changes that occur in the surrounding environment.

The results of the interview data from the informants were typed in the form of transcripts which were then imported into NVivo 12 to be processed and analyzed using various queary features in Nvivo 12. The results of field observations in the form of photos and field notes are also made in the form of transcripts so that they can be processed and analyzed in NVivo. Likewise, a number of documents that are the source of data are imported into NVivo for processing and analysis. The data that has been analyzed is constructed with theory so that

a community adaptation emerges in overcoming environmental pollution due to community-based industries. In addition, this study uses the data analysis technique of the Miles & Huberman (2009) interactive model. Data analysis is carried out continuously and repeatedly starting from data reduction, data presentation, and verification.

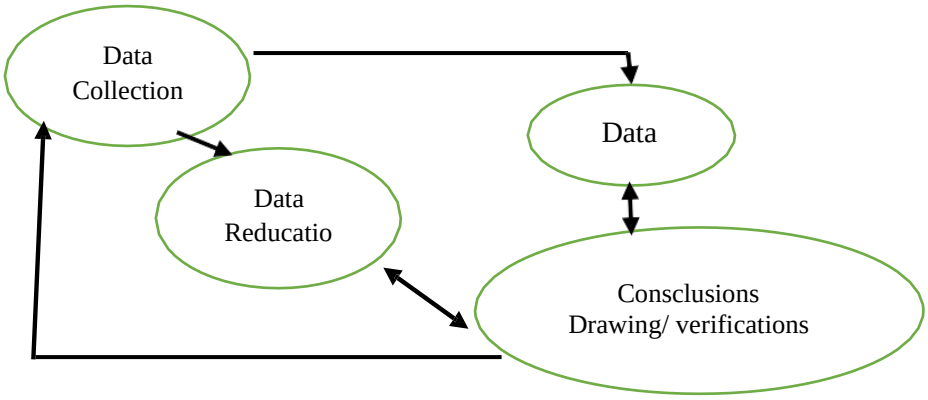

Figure 1. Milles and Huberman Interactive Analysis Model

FINDINGS AND DISCUSSION

Rejosari Village is a green land because starting from the north, south, west and east it is surrounded by farms or rice fields. Most of the people make a living as farmers. The area of Rejosari Village is 282.2 Ha/m2. However, since 2013 the highly productive green land has been contested by factory companies from China, Taiwan and so on who have obtained permission from the Lamongan Regency Government. Since then, many factories have been established in Rejosari Village and finally accommodated workers from outside the Lamongan. Regency area. The existence of the industry is located in the territory of Gajah Hamlet which has an area of ±50 Ha. Many factors cause changes in land use change in the village. There should be green land that is maintained because it is agricultural land for food self-sufficiency. Irrigation flows must be paid more attention because they are one of the impacts of waste disposal that flows into the irrigation stream. This affects the agricultural productivity of pond farmers in the village environment.

Industrial activities, in addition to having an impact on economic growth, also produce industrial waste. If the waste exceeds the assimilation power (neutralization ability) of the river body that has been contaminated with the waste, there will be a decrease in the water quality in the river body which is used for several purposes, including raw materials for drinking water and agricultural irrigation in the aquatic environment such as dams, rivers, reservoirs. Most of the industry players and domestic activities in Lamongan Regency still use the river as a water body to receive the liquid waste produced. These conditions also cause pressure and trigger environmental pollution, resulting in narrowing and siltation of the river body, eventually causing a flood disaster because the carrying capacity of the river is reduced to accommodate and drain rainwater into the sea. Although there are many ways to overcome this problem, including chemical, physical, and mechanical methods.

Development activities cause a high level of water pollution burden such as industrial activities. Complaints about environmental pollution due to industrial activities were carried out by one of the residents of Rejosari Village. The industry is PT Bumi Menara Internusa Lamongan. The type of business carried out is fish processing. The location of industrial activities is in Rejosari Village, Deket District, Lamongan Regency. This industry stands on a building land of 53,946 m2 on an area of 140,763 m2. The production carried out by this factory is frozen raw shrimp, frozen cooked shrimp, frozen flour shrimp, frozen

crab, pasteurized crab and frozen fish. Since 2017, PT Bumi Menara Internusa Lamongan has not complied with the rules in disposing of waste (Citra, 2018). Careless waste disposal and inadequate solid waste treatment systems cause the spread of waste in the environment which can pose a threat to the ecological system (X. Liu, 2020).

Environmental pollution carried out by PT BMI is repeated. In 2018 there was a demonstration carried out by the community as shown in Figure 4.6. The community complained about the pungent smell allegedly caused by waste from PT Menara Internusa (BMI). The community was disturbed by the pungent smell like rotten shrimp. It had been running for three seasons and the pungent smell of rain appeared. However, after there were improvements from the factory, especially the waste treatment, the smell was not bad. But until now the smell is sometimes smelled, especially following the direction of the wind. The people of Rejosari Village have adapted to the environment. This is a consequence that must be taken by the people of Rejosari Village when a factory is established in the Rejosari Village area.

Figure 2. Water Pollution in the Rejosari Village River

Figure 2. explained that there was a seepage of waste entering the river body that was used by community members to irrigate agricultural land. Most of the people of Rejosari Village are farmers, so they really need water for their rice field management. If the irrigation river used by farmers to irrigate rice fields is polluted, it will have a bad impact on fish farming. The people of Rejosari Village experienced harvest failure, especially the fish harvest. The fish died allegedly due to waste water seepage. Based on the agreement, the industry must replace it according to the price of the community's harvest. To understand this very complex interaction, there must be a government policy in changing land use in rural areas with the aim of supporting community livelihoods, maintaining food security and sustainable use of resources. Even though the community's agricultural land is close to the factory, it is hoped that the farming community will not experience difficulties in managing the agricultural land so that it does not disrupt the economy and food security of farmers (Kc & Race, 2020).

The community under the auspices of the village government made a force by creating a communication forum consisting of six village heads around the company's area chaired by Radianto. The communication forum was formed with the aim of facilitating communication with various parties involved, including the government and industry. The community agreed to hold a demonstration because their complaints or aspirations were not responded to by the industry. Not only in the form of demonstrations, the communication forum also complained to the Lamongan Regency government, one of which was the DPRD Commission C and DLH Lamongan Regency. Finally, DLH mediated to find a solution by bringing together the industry and the community. All elements involved

include envoys from DLH Lamongan Regency, Lamongan Regency Economic Section, Joko as the Deket District Sub-district Head, Deket Police Chief with Babinkantibmas, Babinsa Deket District, Karno as BMI Public Relations with their respective expert teams including Septian from the waste treatment section, Toni from the expert team on the Environment, as well as HRD (Human Resources Department) BMI Lamongan Irna Farhani, Bakesbangpol Lamongan.

Based on the results of the community adaptation research, several parties are involved, namely the government, industry and the community. The government manages and protects the environment, the industry conducts proper waste treatment plus a high level of public awareness of the environment. Government programs related to environmental management include 1) Requiring industries/business activities to report environmental documents to the Environmental Agency every 3 (three) months with the aim of controlling water pollution; 2) Socialization and guidance on water pollution control and environmental management for business actors and industry players 3) Optimization of supervision activities by paying attention to environmental law enforcement in the field of water pollution; and so on in accordance with the chapter that has been described earlier. Adaptation will continue to be possible despite environmental changes because there is cooperation between the government, the community and the private sector in handling environmental pollution due to industry. This is a form of collective adaptation that is carried out together according to each other's responsibilities. Considering the challenges of the community adapting to environmental pollution that has both long-term and short-term effects (Cristescu & Gonzalez, 2019.

This collective adaptation is in accordance with the theory developed by Anthony Giddens, namely the Giddens Structure. The essence of this theory is that it disagrees when agents and structures are in separate conditions from each other. There is a complementary dialectical relationship between the structure and the agent. Giddens said that the core part of the study of social sciences does not lie in the experience of agents (individual actors) or structures (certain forms of unity) but lies in actions (social practices) that are regulated across space and time (Doncu, 2016). The beginning of the relationship was the effort of agents with good environmental awareness as the initiator of waste treatment to improve polluted environmental conditions. The efforts made by the agents are manifested in social practices in their actions, namely through demonstrations, improvement of waste treatment and environmental management. These efforts have been responded to by both the government, industry and the community. So that in the end the entire community is able to solve the waste problem that results in environmental pollution. All community groups know and feel the benefits of all their activities, finally adding enthusiasm and being more aware to improve. Environmental problems in Indonesia can not only be rescue and response to disaster. Collective awareness is required to simultaneously protect the environment. Thus, more serious efforts are required in building and increasing human awareness of the environment so as not to experience disturbance and degradation of environmental quality (Wahyudin, 2017). Because the problem of environmental pollution and destruction is currently a constant threat and big danger shadowing life (Nazara, dkk 2024).

Facts prove that society in general lacks awareness maintaining a green environment can have a very negative impact on various aspects of life (KLHK, 2021; Huda, 2022.; Astuti, 2022). Problems related to damage to the green environment are currently very worrying (KLHK, 2021; Astuti, 2022). This condition has an impact on several detrimental aspects human life (Sukartini and Saleh, 2016; Tasurruni, et al., 2019; Huda, 2022). First, loss of biodiversity. It is very important to process industrial waste. The most felt impact society is the pollution of water flows around the population becomes waste dark black with excessive intensity. It should be industrial waste managed by the company can useful well, if not excessive waste water intensity will be able to fertilize agricultural land those around settlement public. However, if waste water industry continues to flow into settlements

residents and the intensity is high, then not only impacts plants rice planted by residents but also impact on public health (Nurdidiq, 2021). so that roles and relationships between stakeholders are needed in sustainable environmental management in supporting environmental conservation based on a collaborative governance perspective (Berliandaldo, 2022)

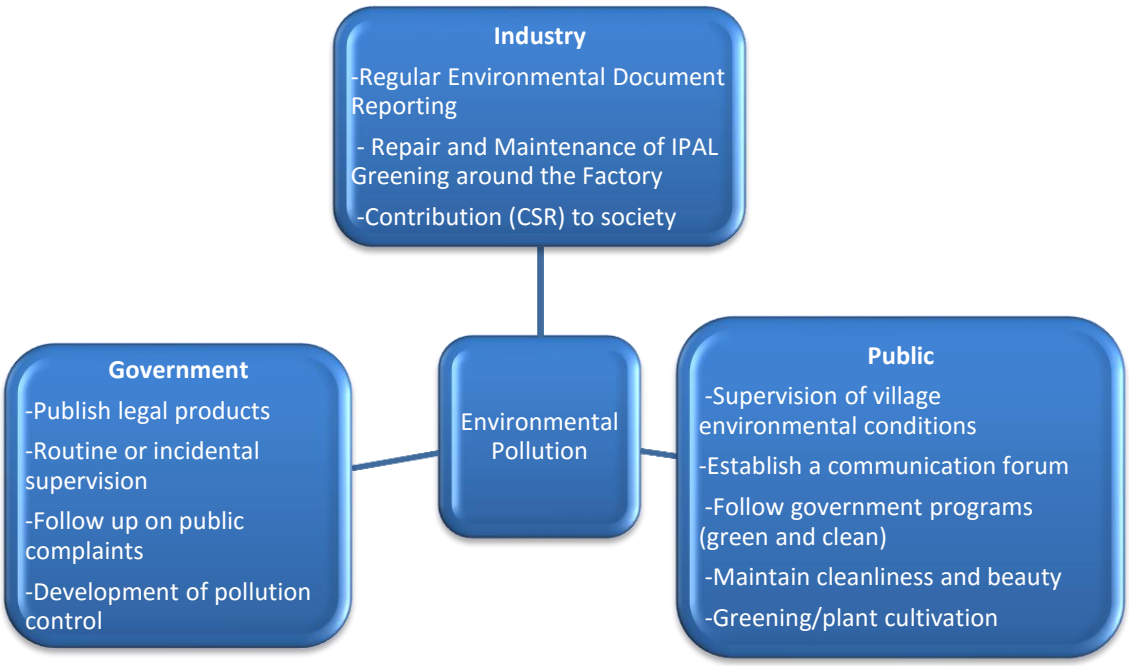

Figure 3. Collaborative Governance: Government, Industry and Society

Environmental pollution caused by industrial waste requires all the roles of stakeholders in the form of management through collaboration so that environmental pollution management runs effectively. one of which is the role of thegovernment is because if environmental damage cannot be controlled it will cause disasters which will certainly be detrimental to the country and its population (Nugraha, 2021). It is hoped that the Collaborative Governance concept will be used in controlling industrial wastewater pollution, where collaboration is needed between actors, both government, industrial players and the community, working together in certain ways or processes which will produce the right solution for controlling industrial wastewater pollution (Hapsari, 2020). Most recent studies on social movement assume that collective action carried out outside established institutions takes a position to challenge political authority or government. Within this framework, the conflict between social movement and government is inevitable. Nevertheless, it is possible for social movement to carry out their missions without having to conflict with political authorities. In other words, social movement can collaborate with the government, for instance around the issue of environmental protection (Wahyudi, 2022). So that the concept of Collaborative Governance is used for the management of environmental pollution due to industrial waste. Based on data in the field, there is collaboration between actors, namely the government, industry players, and the community. Collaborative Governance is the management of the government by directly involving stakeholders outside the government, oriented to consensus and deliberation in each joint decision-making with the aim of making and implementing public policies as well as public programs (Ansell and Gash, 2008). Robertson and Choi (2012) explained that collaborative governance is a collective and equitable process in which each participant has

authority in every decision-making and stakeholders have the same opportunity to channel their aspirations in the process.

The adaptation of the people of Rejosari Village can be seen from the changes in the physical condition of the environment which is increasingly beautiful, clean and green, the community follows the program owned by DLH Lamongan Regency namely green and clean. The implementation of the LGC program in Lamongan Regency has generally been effective (Anas, 2017). Rejosari Village has a communication forum that makes it easier for the community to coordinate with the government and industry in the event of environmental pollution, Because BMI's industrial activities are growing rapidly, causing environmental pollution caused by the disposal of industrial waste (Nafisah, dkk 2021). Previously, the community immediately held demonstrations due to environmental problems caused by the industry. Now the community has begun to adapt to water and air pollution with several phases, namely (1) Self-awareness where people identify the symptoms of pollution that occur, and monitor the surrounding environment; (2) Participation, namely the community increases knowledge or confirms existing knowledge with new knowledge to solve doubts by participating in public consultations conducted by the industry or socialization of the DLH program; (3) Community coordination began to try new behaviors, namely creating a Communication Forum to facilitate coordination in the event of environmental pollution caused by industrial waste. Especially when conducting aidiensis to the industry and DLH; (4) Community adaptation to new behaviors after the previous three phases, namely awareness, new knowledge (participation) and attitude (coordination).

CONCLUSION

In reality, industry not only increases economic growth but also has a negative impact on the environment. One of the indicators used to measure environmental degradation is the conversion of green land to commercial land. Community adaptation is going well because there is a good level of awareness supported by the structure that has been built. Based on the time space, community adaptation in dealing with environmental pollution is carried out in several phases, namely (1) Self-awareness, where the community identifies the symptoms of pollution that occurs, and supervises the surrounding environment; (2) participation, namely the community increases knowledge by participating in public consultations carried out by the industry and socialization of the DLH program; (3) Coordination, the community forms a communication forum to facilitate coordination in the event of environmental pollution caused by industrial waste. Especially when conducting hearings with industry and the government; (4) Community adaptation to carry out new behaviors in accordance with self-awareness, participation, and coordination while maintaining the surrounding environment. So that Collaborative Governance is used for the management of environmental pollution due to industrial waste.

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