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# The Effects of Ammonia Leakage, Air Pollution, and Transportation on Climate Change in the Village Environment around Pt. Iskandar Muda Fertilizer (Pt.Pim) Dewantara District

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Received: 20 October 2021

Accepted: 10 January 2022

Published: 13 February 2022

**Abstract:** *The existence of the Company PT. Pupuk Iskandar Muda in Dewantara District, North Aceh Regency, Aceh Province, in addition to having a positive impact, also harms the environment name in the form of air pollution (ammonia gas leakage), which is surrounding community. It hoped that the air pollution could control the North Aceh Regency Government and the Company not to harm the surrounding community. However, in reality, the Regional Government has not been able to carry out air pollution control/mitigation properly. In its prevention efforts, the Company has not fully protected so that the incidence of pollution repeats itself from year to year without special handling. This phenomenon seems to be commonplace and is considered trivial by the Company, the government and the surrounding community. The smell of ammonia gas that occurs almost every day in the Dewantara District is natural. All stakeholders are not dangerous and can coexist with it. It should not be left alone, let alone decided by academics as a harmless problem. The implementation of this research uses a descriptive-analytical study wherein obtaining as much data as possible is carried out through various techniques that are arranged systematically to seek data collection from research results that follow the nature of the problem and the research objectives to obtain. This study aims to determine the extent to which the implementation of air pollution control/mitigation (ammonia gas) and to find out what obstacles are experienced by local governments and companies in carrying out control/mitigation of air pollution (ammonia gas) as a result of the operation of PT. Pupuk Iskandar Muda in Dewantara District, North Aceh Regency, Aceh Province. This research hopes that strategic steps can be taken by the Regional Government and the Company so that the chronic air pollution (ammonia gas) will be immediately resolved and will not happen again. The outputs of this research are research reports and scientific publications in accredited national journals and research books with ISBN.*



***Keywords: Ammonia, Air Pollution, Environment, Climate Change***

## **1. INTRODUCTION**

Environmental problems often arise due to the disposal of waste that exceeds the level of capacity or ability of the environment to sustain or transform it. Therefore, in the context of carrying out environmentally sound development, it is necessary to maintain harmony between various businesses and activities because basically, every business and training will have an impact on the environment, it is essential to analyze it from the beginning of the planning so that measures to control these negative impacts can be implemented. They were prepared as early as possible. An analysis of the environmental effects is essential for the decision-making process regarding implementing business plans and or activities that have a large and significant impact on the environment. PT. Pupuk Iskandar Muda, during its establishment in North Aceh in its production activities, cannot be separated from pollution; ammonia pollution began to occur from 2010-2016 and has not received severe treatment from PT. Pupuk Iskandar, the company's responsibility, can protect the community from ammonia poison. The environmental aspect, the establishment of this fertilizer company harms pollution for the people of the Dewantara sub-district. its prevention efforts the company has not fully protected so that the incidence of decay repeats itself without special handling. This phenomenon seems to be commonplace and is considered trivial by the company. The government and the surrounding community. The smell of ammonia gas that occurs almost every day in the Dewantara District is a natural thing and has been agreed by all stakeholders as not dangerous and can coexist with it. This, of course, should not be left alone, let alone decided by academics as a harmless problem

### **Research purposes**

This research was conducted with the aim of:

1. To find out how far the implementation of control/mitigation of air pollution (ammonia gas) as a result of the operation of PT. Pupuk Iskandar Muda in Dewantara Sub-district, North Aceh Regency, Aceh Province;
2. To find out the constraints of local governments and companies in carrying out control/mitigation of air pollution (ammonia gas) as a result of the operation of PT. Pupuk Iskandar Muda in Dewantara Sub-district, North Aceh Regency, Aceh Province.

### **Literature Review**

1. PT. Pupuk Iskandar Muda is a subsidiary of PT. Puri (Persero) which is engaged in the chemical industry, mainly producing urea and ammonia fertilizers. In carrying out industry activities, the company produces air pollution or waste that can damage the environmental ecosystem. However, the surrounding community is apathetic about the ammonia pollution and has never taken any steps or actions for things that are detrimental to the ecological community (Silviana Delita, 2019).

2. PT. Pupuk Iskandar Muda has not yet fully implemented environmentally sound development, but PT was later discovered. PIM just received an Environmental Award on



January 28, 2016, from the Ministry of Environment and Forestry of the Republic of Indonesia through the Aceh Bapedal, which handed over the Blue Proper certificate to PT. Pupuk Iskandar Muda's certificate was given as a form of appreciation from the ministry of environment and forestry towards the company PT Pupuk Iskandar Muda (Waspada 2016 through I cut Rizkia, 2016).

3. Mitigation is a series of efforts to reduce disaster risk, through physical development and awareness and capacity building in dealing with disaster threats (Source: Law Number 24 of 2007 concerning Disaster Management). Air is an essential factor in life, but air quality has changed with increasing physical development and industrial centres, air quality has changed. The air that used to be fresh is now dry and dirty. If this is not addressed immediately, these changes can endanger human health, life, animals, and plants (Soedomo, 2001).

4. Air pollution emissions by industry are highly dependent on the type of industry and its processes, industrial equipment and utilities. Various industries and power plants use the energy and heat from burning charcoal and gasoline. The by-products of combustion are SO<sub>x</sub>, smoke and other contaminants. Although on a small scale, the process of burning waste plays a significant role in increasing the number of pollutants in the air, especially dust and hydrocarbons. The important thing that needs to be taken into account in the emission of air pollution by waste is particulate emissions due to combustion. In contrast, emissions from the decomposition process that need to be considered are HC emissions in the form of methane gas (R. D. Ratnani, 2008).

## **Method**

Data collection methods in this study are:

1. Observation (Observation): observing the symptoms under study. In this case, the five human senses

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1. Observation (Observation); namely observing the symptoms under study. In this case the five human senses (sight and hearing) are needed to capture the observed symptoms. What was captured earlier, recorded and then the records are analyzed.

2. Interview is one method of collecting data by way of communication, namely through contact or personal relationships between data collectors (interviewers) and data sources (respondents).

## **2. RESEARCH RESULT**

Ammonia Hazard Identification In general, exposure to ammonia in fertilizer companies can occur due to 2 (two) consequences, namely from programmed activities such as the internal inspect program and non-programmed events/disruptions such as leakage of the tank system or the occurrence of tank explosions. The scheme for

identifying possible conditions that can lead to the release of ammonia from the tank is described as follows: The term “binderless” bonding per se is misleading, but is, nevertheless,



used here as a synonym for bonding of wood without extra added adhesive. Joining two wood surfaces always needs an adhesive layer. The adhesive can be added

1. From the results of the identification, it is known that the factors causing the leakage of ammonia, namely due to human error and the weakness factor of the condition of the equipment (instrumentation system, mechanical, flow pipe and environment), such as:

- A. Overpressure occurs which causes the pressure guard to open, because the pressure setting is exceeded.
- B. There is a vacuum pressure that causes the tank to fall out/damage/leak during the transfer of ammonia from the tank to the vessel or from the tank to the urea plant there is a mechanical damage to the compressor or the cessation of the power supply resulting compressor shutting down. the occurrence of leaks in the flange system and piping valve packing.
- C. the occurrence of explosion in the flow pipe, due to high pressure.
- D. single wall tank design, susceptible to mechanical impact, corrosion and sensitive to changes in environmental temperature.
- E. During the tank emptying job, there is still too much remaining ammonia liquid that cannot be taken up, because the pump suction pipe does not reach the bottom of the tank floor. The location of the tank is relatively close to the sea, if a tsunami occurs, the safety of the tank is very worrying.

2. With the existing industrial accident prevention procedure model, it was found that there are still many factory employees and the surrounding community who do not know and cannot distinguish the siren tone of each industrial accident level. Including there are still many who do not understand about how to wear personal protective equipment in an emergency. Meanwhile, the procedure has not included evidence regarding the distribution pattern of ammonia, the dominant wind rose for determining evacuation routes and routes and simulating cases of the worst exposed areas that can be used for determining Assembly Points, Temporary Safe Buildings, Command Posts and safe places for evacuation.

1. In terms of saving people, there is no system to be able to quickly find out the number of people who are at work/dangerous places.

### **3. CONCLUSION**

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