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## RESEARCH PAPER

# The importance of securitization in addressing environmental issue: Case on Freeport's tailing waste

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**Abstract.** Numerous environmental challenges remain unresolved in Indonesia, primarily due to a lack of understanding and limited exposure to the issue. This study discusses a particular case specific about tailing waste resulting from mining activities conducted by Freeport in Papua. This issue may persist without securitization efforts from relevant stakeholders. Interestingly, the key stakeholders in this case are the local community, diverging from the stereotype dominated by NGOs and other private actors. Additionally, this study served as a response to the scarcity of discussion securitization regarding environmental concerns in Indonesia. The research employs qualitative descriptive methods supplemented by a comprehensive literature study, drawing upon publications from the Google Scholar database related to securitization in the context of environmental issues in Indonesia. The finding will be visualized by the VosViewer program. The results of this study show the need for comprehensive discussions surrounding the Freeport tailing waste case. These findings are derived from significant keywords identified in related publications, particularly those related to securitization. In conclusion, the research highlights the importance of securitization by certain stakeholders in addressing particular environmental issues, ensuring that, they receive adequate attention and resolved by responsible actors.

**Keywords:** Securitization; environmental issue; Freeport; tailing waste

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## 1. Introduction

Since the end of the Cold War, the concept of national threats has evolved beyond the confines of armed conflict and traditional security dilemmas. The rapid advancement of technology and information has led to the diverse array of international actors. The Copenhagen School's concept of securitization seeks to explore deeper into the roles played by various actors in security, encompassing not just states but also societies, and individuals, while also expanding the scope of studies ([Hadiwinata, 2017](#)). Utilizing the securitization concept as a framework is instrumental in globalizing an issue, since it elucidates International Relations phenomenon that transcend geographical limitations ([Setiawan & Hapsari, 2017](#)). Consequently, it can be concluded that contemporary issues in international relations extend beyond the realm of armed races. This also

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provides an opportunity to address concerns in developing countries, particularly those related to environmental issues.

According to the United States Geological Survey, Indonesia holds the 6th position among countries rich in mining materials. This status has propelled Indonesia to become the world's leading producer of coal, gold, copper, and lead ([Dahlius, 2014](#)). In 2021, Indonesia's coal production soared up to an impressive 614 million tons, marking a substantial increase from the 2020 figure of 565.69 million tons ([ESDM, 2022](#)). In the same year, Indonesia also achieved a gold production 78.9 tons ([Asmarini, 2022](#)). Additionally, copper production reached 2.2 million tons in 2020 ([BPS, 2022](#)). The Ministry of Energy and Mineral Resources in Indonesia recorded a lead production of up to 34,500 tons ([Rizatya, 2022](#)). Considering Indonesia's abundant mineral resources, it is evident that Indonesia has become a significant attraction for major mining companies, enticing them to invest in and operate within the country.

One of the prominent mining companies operating in Indonesia is American Freeport-McMoRan Copper & Gold Inc, commonly referred as PT Freeport Indonesia (PTFI). PTFI had a presence in Indonesia since the enactment of *Undang-Undang* No. 1 of 1967 on Investment during Suharto era. Since its establishment, PTFI has made substantial contributions to the country's economic prosperity. From 1992 to 2021, PTFI directly injected approximately US\$ 21.1 billion or roughly Rp. 300 trillion into the economy ([Kusnandar, 2021b](#)). As for income tax, the Indonesian government received US\$ 71.7 million from PTFI in 2020 ([Indrawan, 2020](#)). Furthermore, PTFI provides employment opportunities to a significant workforces, with a total of 127,875 employees as of March 2021 ([Kusnandar, 2021a](#)).

While PTFI has made positive contributions to Indonesia's economy and has created a substantial job market, it also encountered several setbacks related to environmental issues. In September 2017, the Indonesian Environment Department visited the PTFI site and identified 47 violations, with the most significant infractions linked to tailings ([Massola & Rompies, 2018](#)). PTFI production of tailing waste falls into the "Toxic and Hazardous" category, which is prohibited under Law No. 32 2009 about the protection and management of the environment and living space.

The adverse environmental impact caused by mining waste is substantial, leading to consequences such as the loss and degradation of natural areas or damage the health of populations exposed to toxic metals resuspended as dust ([Carmo et al., 2020](#)). PTFI produces approximately 230,000 tons of tailings daily, which transported to the lowland and coastal zone known as Modified *Ajkwa* Deposition Area (ModADA) ([Taberima et al., 2020](#)). According to PTFI, this river tailing system is considered the most suitable because the challenging terrain, the threat of earthquakes, and heavy rainfall.

However, this tailing management system has elicited strong reactions from various stakeholders. In 2018, the Indonesian government requested a substantial reduction in tailing waste, from 50% to 5% ([Massola & Rompies, 2018](#)). Additionally, the local tribes of Papua's, including *Amungme*, and *Kamoro* tribes, have voiced their concerns regarding PTFI tailing managed practices. Yosep Yapi, a prominent figure among *Amungme's* community, has consistently opposed the disposal of the company's tailing waste into the *Ajkwa* and *Otomona* rivers, which ultimately flow into the *Mimika's* lowland ([Supar, 2018](#)). Meanwhile, Simpson, representing the *Kamoro* tribe delegation, expressed the community regret over the decision to entrust their lands to PTFI's management ([Nasution, 2017](#)).

PTFI has not only caused environmental damage through its mineral extraction activities but has also affected education and health aspects. Reactions have also arisen from non-governmental organizations, namely WALHI and Greenpeace. WALHI has called upon the government to initiate an investigation to evaluate the damage caused by tailing waste and the associated cost of restoring it to its previous condition ([Simanjuntak, 2015](#)).

Drawing from this phenomenon, this article seeks to analyze the Indonesian government's response to the environmental damage caused by PTFI using employing the securitization concept and qualitative methods. The analysis will include in include data visualization to emphasize the significant roles played by specific stakeholders in the environmental issue, exerting pressure on those deemed responsible for the occurring environmental damage. Consequently, this pressure may encourage responsible actors to address and resolve these problems.

## 2. Method

This research employs qualitative descriptive methods to examine the subject of the study. This primary objective if this research is to provide an accurate describing of the nature of a symptom, situation, individual, or certain group. It also aims to determining the nature of a symptom prevalence or the existence of specific relationships with symptoms or conditions within society (Silalahi & Gunarsa, 2009). To gather the data, we conduct a literature study encompassing various statistical sources. According to Miles and Huberman, de data analysis process involves three key lines stages: data reduction, data presentation, and drawing conclusion (Silalahi & Gunarsa, 2009).

In addition to employing qualitative descriptive methods, this research is further supported by a statistical literature study that leverages articles from Google Scholar and utilizes VosViewer as a data visualization tool. This approach is undertaken to fortify the argument that securitization, as a means of addressing environmental problems and issues in Indonesia, remains relatively limited. As an initial step, this study compiles all publications related to securitization and environmental issues on Google Scholar from the years 2000 to 2022. The keywords used in the search include 'securitization', 'environmental issue', 'Indonesia', and 'isu lingkungan'.

These selected keywords are deemed relevant for collecting publications that which will substantiate our analysis and arguments within the study. The chosen publication timeframe spans from the year 2000 to 2022, aiming to comprehensively encompass all relevant recorded publications.

Citation metrics	
Publication years:	2000-2022
Citation years:	22 (2000-2022)
Papers:	82
Citations:	230
Cites/year:	10.45
Cites/paper:	2.80
Authors/paper:	1.66
h-index:	7
g-index:	14
hl,norm:	5
hl,annual:	0.23
hA-index:	3
Papers with ACC ≥ 1,2,5,10,20:	14,6,2,1,0

**Figure 1.** Quantity and the statistics of publications used in this study

Upon conducting a Google Scholar-based article search, a total of 165 related articles were initially identified. This number was subsequently reduced to 82 papers using the Publish or Perish application, following a more stringent screening process to create the most relevant data for visualization. It's worth noting that these 82 papers serve as a source of the data for the study,

rather than direct references in the articles. The Publish and Perish application selectively extracts specific portions of the articles and publications used in this study, focusing on the significant keywords and terms found within them. As a result, the application establishes connections among related terms across various articles within the databases. Consequently, the entire set of 82 papers will not be explicitly listed in the references. Figure 1 shows a breakdown of the publications as displayed in the Publish and Perish software.

The record of the relevant publications are saved in .ris format and then processed using VosViewer for visualization. In this study, a minimum keyword or term occurrence of 3 is set as the threshold, which may seem relatively low. This decision is intentional to ensure that more keywords and terms can be included in the visualization process, despite the relative limited number of publications discovered. Consequently, a term needs to occur at least three times to be recognized and included in this study. While there are 596 keywords and terms relevant to the study, only 20 meet the threshold.

Next, a screening process for the terms is conducted. By default, only 60% of the most relevant terms are included. However, in this study, all terms meeting the threshold are incorporated, resulting a final count of 20 keywords and terms. In the subsequent step of the literature study, these words are mapped, and the results are presented in the discussion section of this article.

It is crucial to note that a significant knowledge gap emerges regarding the discussion of the importance of securitization in addressing environmental issues in Indonesia. This is evidenced by the limited number of publications and the constrained variety of keywords and terms derived from these publications, indicating a dearth of comprehensive discourse on environmental issues within the context.

### **3. Result and Discussion**

In this section, there will be a two-part analysis of this study. Firstly, the results from the statistical literature study will be presented to substantiate the argument that securitization has not yet been recognized as important enough for discussion and practical application in addressing environmental issues in Indonesia. Secondly, the qualitative analysis will demonstrate the efficacy of securitization in resolving environmental problems in Indonesia. It is important to note that the analysis is divided into two parts. The first part of the analysis is relying on the software-generated data utilizing the features of VosViewer, while the second part of the analysis is based on the library research, serving as a complementary analysis to the first part.

#### **3.1. Result of Literature Study on Securitization by Indonesia's Government Regarding Environmental Issue**

Starting with the first part, there are relevant publications and literature addressing this issue. Some studies involve cross-country comparisons, while others focus specifically on the context of PTFI in Indonesia. They explore how various countries generate substantial large amounts of solid waste, concurrently grappling with recycling challenges to reduce the environmental impact. This situation can serve as a valuable example for Indonesia in addressing similar issues ([Araujo et al., 2022](#)).

In another literature, [Astuti \(2018\)](#) observes that Indonesia's policies, which have not prioritized the environment when dealing with pollution cases, have led to an environmental crisis in Mimika Papua. This crisis is directly proportional to the threat posed to human security, affecting aspects such as environmental, economic, food, health, and personal security. What sets our research part is the incorporation of statistical literature review, processed using VosViewer, which complements in findings ([Astuti, 2018](#)).

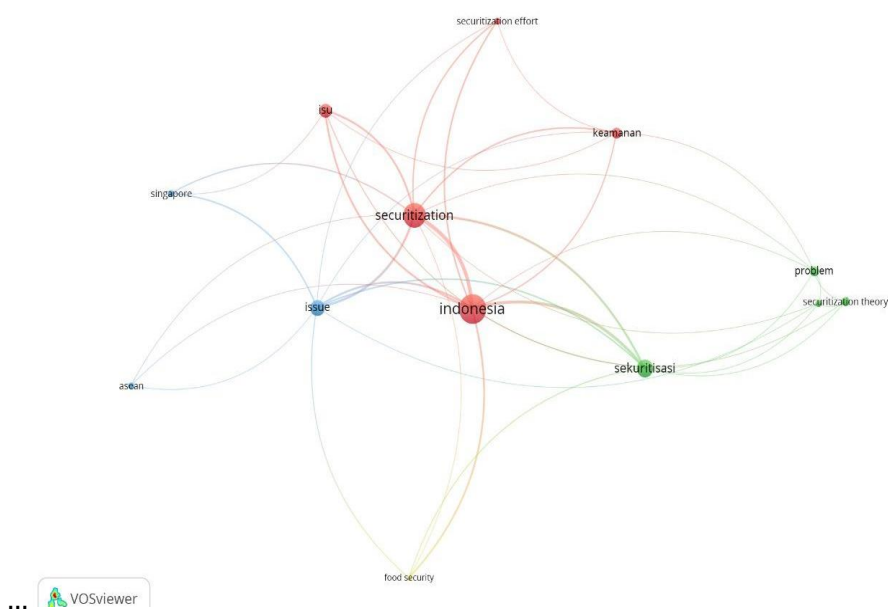
From the conceptual perspective, [Winarno \(2017\)](#) asserts that global warming is a challenge with the potential to foster regional collaboration, as seen in the EU and ASEAN, and may lead to

the creation of new regimes. However, these regimes have encountered limited success in addressing environmental issues. The formation of international regimes typically relies on two approaches: international agreements and systems that offer economic incentives to encourage state to contribute more. Both systems are based on principles of rewards and penalties, wherein compliance results in rewards while non-compliance leads to adverse consequences. This presents a challenge to the interests of countries, as they must adjust their national priorities accordingly to mitigate environmental problems (Winarno, 2017).

Furthermore, Trombetta (2007) observes that The Copenhagen School restricts the potential for questioning and transforming environmental issues within the Security Studies paradigm, simultaneously legitimizing these problems. The research also highlights that The Copenhagen School proposes a rather menacing solution, allowing new threats to be incorporated into and sedimented structures, creating an appearance of unchangeable. It is important to clarify the purpose of this paper is to deepen the understanding of the extent to which human actions influence the securitization process based on the Copenhagen School's concept, rather than challenging the concept's domination in a Q88 Security Studies (Trombetta, 2007).

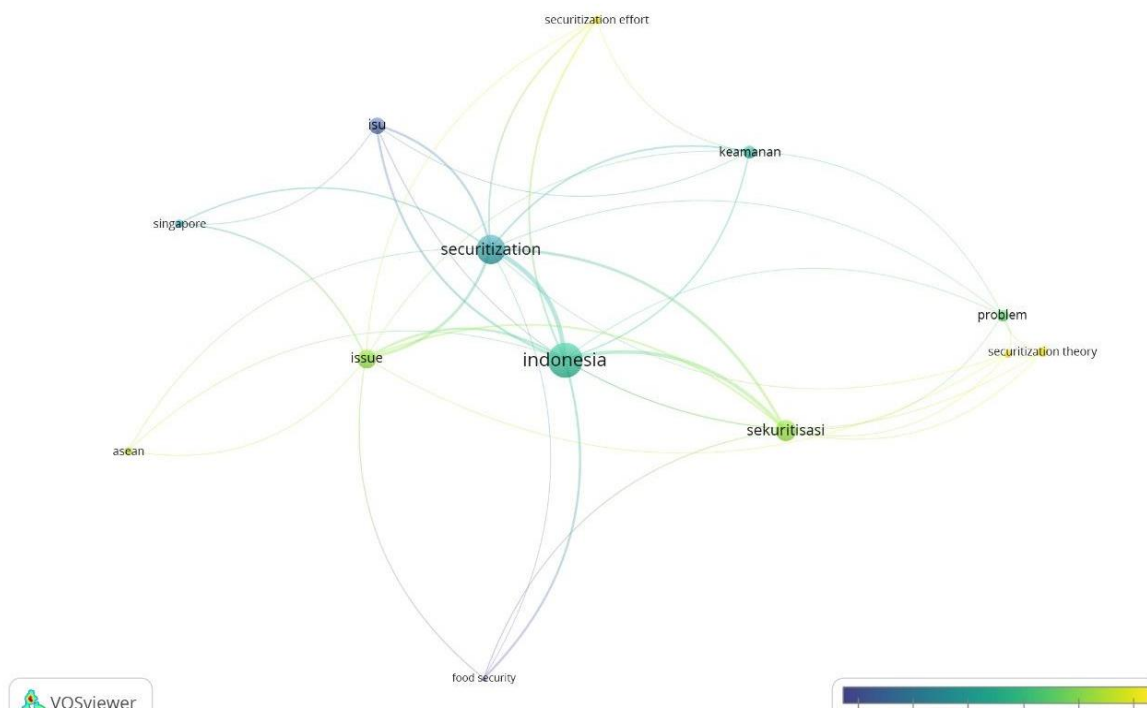
Unfortunately, the data visualization results from VosViewer produce a less-than-satisfactory network map concerning securitization in the context of environmental issues in Indonesia. This limitation stems from the scarcity of keywords and terms that can be extracted from the limited available publications. This indicates that the concept of securitization, particularly in the realm of environmental concerns, remains somewhat obscure, especially within the Indonesia context.

This situation may arise because scholars tend to adhere to a traditional interpretation of securitization concept, predominantly focusing on military and national defense matter. However, as this study demonstrates, the securitization concept can be a valuable tool to analyzing human security issues, including environmental security, as exemplified in the discussion of Freeport's tailing waste. It is noteworthy that the term "Food Security" is included, further supporting the argument that securitization theory can effectively analyze non-traditional security issues. Additionally, the map also features "Singapore", suggesting that Indonesia and Singapore have experienced or are currently dealing with environmental issues, such as transboundary haze pollution. The map is presented in Figure 2 for reference.



**Figure 2.** Network visualization of terms derived from related publications.

There is another map that shows a time-based overlay of relevant terms (Figure 3), illustrating the publications years related to the topic. The evolution of this topic remains somewhat unclear, as the surge in publications only began in 2015. The focus of the publications is also distributed across different years, suggesting that there is no certain trend in scholarly discussion on this topic. Particularly concerning the intersection of securitization and environment, it is evident that securitization theory is being applied to analyze a broader scope, namely at the regional level, as indicated by the presence of the term “ASEAN” on the map. This suggests that countries and members of regional cooperation are coming together to seek solutions as part of securitization efforts aimed at addressing issues deemed existential threats.



**Figure 3.** Time-based overlay visualization of terms relevant to the research from 2000-2022.

Moreover, there are noticeable clusters of relevant keywords and terms within this research, as clearly depicted in the keyword networking map. These clusters provide additional evidence of the limited discourse surrounding the securitization of environmental issues in Indonesia over the years. This is evident in the initial map (Figure 2), where keywords and terms are differentiated by various colors. These keywords and terms are grouped into four distinct clusters, as presented in Table 1.

**Table 1.** Clusters of keywords/terms relevant in the study based on the visualization map

Clusters	Keywords
Cluster 1	Indonesia, issue, security, securitization, securitization effort
Cluster 2	Problem, securitization process, securitization theory, securitization
Cluster 3	ASEAN, issue, Singapore
Cluster 4	Food Security

Based on the Figure, it is evident that cluster 1 consists of terms commonly found in publications addressing the securitization process in Indonesia. Words such as 'Indonesia', 'issue', 'security', 'securitization', and 'securitization effort' are prevalent in this cluster. This illustrates the Indonesian government's endeavor to secure public interests against existential threats. However, upon closer examination of the research data, cluster 1 primarily contains generic securitization terms. It does not investigate into or specify the nature of security issues, whether they are traditional or non-traditional. As previously mentioned, the securitization process extends beyond traditional concerns. Therefore, this article seeks to utilize this concept for a deeper analysis of environmental issues, which will be discussed more extensively in the following section.

Moving on to the next cluster, cluster 2 consists of fundamental terms commonly found in the publication used, including 'problem', 'securitization process', 'securitization theory', and also 'sekuritisasi'. These two clusters collectively suggest that while more publications discuss securitization as an analytical tool, they do not predominantly focus on practical case studies demonstrating how it can address environmental issues. However, given the basic correlation and the type of keywords prevalent in this cluster, it appears that any analysis of a specific (environmental) problem employing the securitization theory and concept may only scratch the surface and lack in-depth research. Moreover, when it comes to particular issue like tailing waste resulting from major mining corporations, as explored in this study, the application of the securitization concept for analyzing environmental concerns is evidently not a widely adopted approach.

Cluster 3 consists of terms related to location and the issue's focus, including 'ASEAN', 'issue', and 'Singapore'. These terms are particularly relevant to the Transboundary Haze Pollution (THP) issue, stemming from land and/or forest fires in Indonesia since 1980, which prompted Singapore and Malaysia to call for securitization of environmental concerns within ASEAN ([Febriyani, 2019](#)). The forest and land fires in Indonesia, particularly in Kalimantan, persisted not only in the 1980s but recurred in subsequent years. In 1995, ASEAN adopted the ASEAN Cooperation Plan on Transboundary Pollution (ACPTP). This plan encompassed measures for preventing and addressing forest fires and haze, including the establishment of National Focal Points to enhance regional coordination and implementation of policies and strategies to tackle THP issues ([Febriyani, 2019](#)).

Last but not least, cluster 4 consists of a solitary term that may have been discussed in one or several of the publications, namely 'food security'. Food security falls under the realm of human security issues or non-traditional issues deserving attention from relevant stakeholders, given its paramount importance to human well-being. In essence, the scarcity of food supply or food crisis can be regarded as an existential threat, prompting certain parties to enact emergency responses to address the situation. Moreover, this shows that there have been scholars who have utilized the securitization theory or concept to analyze non-traditional security issues in the past.

As mentioned in the methods section of this article, there exist a knowledge gap on regarding the discussion of this issue. This gap is further substantiated by the data visualization and the clusters of keywords related to utilization of securitization for addressing responding to environmental issues, which indicate relatively limited numbers. There should be more extensive discourse and research on how securitization can contribute to solving environmental issues in Indonesia. Additionally, more securitization initiatives should be undertaken to address environmental problems in the country. This argument gains further validated the subsequent discussion of the success of securitization in the case of Freeport's tailing waste in Indonesia below.

### **3.2. Case on Freeport's Tailing Waste**

The concept of security threats has evolved from what was once exclusively traditional to encompass a broader category now referred to as non-traditional threats. The Copenhagen School

explores the concept of securitization as a phenomenon in which security studies extends beyond military aspects and encompass various facets of human life, including human rights, pandemics, crime, environmental damage, and natural disasters ([Hadiwinata, 2017](#)). It also investigates deeper into the roles of actors in security, spanning from the state and society to individuals.

One of the non-traditional threats that occurring in Indonesia is environmental damage due resulting from the operation of PT Freeport Indonesia, a subsidiary of American-based mining company [Freeport McMoran \(2022\)](#). The company officially commence operations in 1970 by exploring and exploiting one of the world's largest copper and gold deposits located in the Grasberg minerals district in Papua, Indonesia ([Freeport McMoran, 2022](#)). According to the company, between 1990 through 2019, the Grasberg minerals district produced a total of 33 billion pounds of copper and 53 million ounces of gold, including over 27 billion pounds of copper and 46 million ounces of gold from the Grasberg open pit ([Freeport McMoran, 2022](#)). As the second quarter of 2022, PTFI reported consolidated sales of 410 million pounds of copper and 474 thousand ounces of gold, marking an increase from the second quarter 2021 when they had consolidated sales of 310 million pounds of copper and 302 thousand ounces of gold ([Freeport McMoran, 2022](#)). This rise primarily reflects increased operating rates at the Grasberg minerals district. Consolidated sales volumes from PTFI are expected to approximate 1.5 billion pounds of copper and 1.7 million ounces of gold for the year 2022 ([Freeport McMoran, 2022](#)).

The extensive extraction of mining commodities extraction in Grasberg is not without its cost. One of the largest volumes of waste generated by PTFI operations comes in the form of tailings – residual moisture and sand produced during the separation of concentrate from ore at the mill (The Government of Indonesia's Law Number 32, 2009). According to (The Government of Indonesia's Law Number 32 of 2009 regarding Environmental Protection and Management, tailings waste falls under the hazardous and toxic waste category. It is defined as waste containing dangerous and/or toxic material, due to its characteristics, concentration or volume, may directly or indirectly damage or pollute the living environment and pose endanger human health. PTFI's concentrate preparation process involves the physical extraction of ore. finely grinding it to separate minerals containing copper from rock particles with no economic value. Given the unique topography, seismic activity, and high rainfall, often exceeding 10 meters in some areas, the company employs a controlled tailings management system. This system utilizes river currents to transport the tailings to a designated lowland and coastal areas known as the Modified *Ajkwa* Deposition Area (ModADA).

Despite this management system receiving approval from the Government of Indonesia after undergoing numerous technical studies and multi-year review process, it has faced opposition from various parties, especially from the indigenous Papuan people, specifically the *Amungme* and *Kamoro* tribes. Yosep Yapi, a community leader of the *Amungme*, stated that they have been opposed disposal of tailings waste through the *Ajkwa* and *Otomona* rivers to the Mimika lowland area from the beginning ([Supar, 2018](#)). Meanwhile, Simpson, the representative of the *Kamoro* Tribe, expressed regret over granting land to Freeport, as it not only resulted in environmental damage due to mineral extraction waste but also had adverse impacts on education and health aspects ([Nasution, 2017](#)).

In addition to indigenous peoples, reactions have also emerged from nongovernmental organizations (NGOs). Wahana Lingkungan Hidup (WALHI) called upon the government to conduct an immediately investigation into the environmental damage caused by tailings waste and assess the potential costs of rehabilitation process for this damage ([Simanjuntak, 2015](#)). Furthermore, Greenpeace has also responded to this issue. Their report reveals that Freeport discharged over 200,000 tons of tailings per day into the *Otomona* and *Ajkwa* Rivers, posing a threat to the sustainability of Indonesia's oceans. Greenpeace has committed to monitoring the impact of Freeport's waste and carrying out field parameter testing ([Saturi, 2013](#)).



From the Copenhagen School's perspective on securitization, the responses from these various parties has framed the disposal of tailings as a threat to the environment. This illustrates how certain entities, including the government, community leaders, and NGOs, employ speech acts or statements to convey that a specific matter holds the potential to trigger a disaster. The endeavor to position the environmental issue as a threat to both individual and national security aims to garner public's recognition, ultimately paving the way for emergency responses beyond standard policies ([Hadiwinata, 2017](#)).

The statements made by two representatives of indigenous tribes, WALHI, and Greenpeace constitute a form of speech. They highlight that Freeport's operations have caused environmental damage through its tailings waste, urging the government take immediate and resolute action as this activity may harm their lives and ecology. The two tribes have also prompted the government to cease Freeport's production activities to mitigate the biodiversity loss resulting from its operations. This case falls within the purview of the security concept articulated by Mahbub ul Haq, a permanent consultant to the United Nations Development Program (UNDP), regarding environmental security and health security ([Haq, 1995](#)). In response to this issue, these agents have urged the government to take emergency measures, given the urgency of this situation, which must be addressed immediately to prevent further more damage.

Finally, the government responded to this problem by conducting an Environmental Impact Analysis investigation. The examination's results showed a violation that had caused environmental damage. As a subsequent action, the Ministry of Environment and Forestry imposed a fine of 460 billion Rupiah on Freeport ([Rizki, 2019](#)). The policy outcome illustrate how pressure from various stakeholders has played a significant role in compelling the government to take decisive measures to address the issue, which is deemed a non-traditional security threat with potential risks to the environment and the livelihood of numerous species.

In its development, PTFI claims that it continually evaluates and updates the tailings management system to minimize risks. Their research suggests that once mining activity concludes, the deposition area will recover through plant succession and may be suitable used for agricultural, forestry, livestock farming, or fishery activities. The annual cost of implementing the tailings management system over the last three years averaged approximately US\$120 million ([PTFI, 2021](#)).

PTFI has also carried out a program to recycle tailings into a concrete additive for local infrastructure development. From 2007 through 2014, in collaboration with the Papua provincial government and the Mimika Regency government, the company utilized tailings as the primary component in building infrastructures. This included the Trans-Nabire highway, the Mimika Regency government offices, the Pomako road and bridge, the Eme Neme Yauware convention hall parking lot in Timika, and other structures. In total, 1.1 million tons of tailings material was utilized in these infrastructure projects amounting to US\$9.3 million.

Working in conjunction with the Ministry of Public Works and People's Housing and the Ministry of Environment and Forestry, the company continues to explore the utilization of tailings for infrastructure. PTFI transported approximately 4,000 tons of tailings material to Merauke Regency, Papua, for the construction of roads and other public facilities ([Tempo, 2020](#)). The company also welcomes opportunities for collaboration with any party interested in recycling mining waste or tailings to expedite infrastructure development in Papua. Claus Wamafma, the Director of PTFI, stated that there would be no problem if certain parties, both government and private, wishes to take advantage of the sand left over from Freeport's mining ([Maskur, 2021](#)). Moreover, there is potential for further development, as indicated by the interest of foreign investors in this project, including one of from Canada. This is because tailings waste has been proven to be viable aggregate material for public infrastructure ([Rahayu, 2021](#)).

Furthermore, this tailings waste management is an implementation of the Decree of the Minister of Environment and Forestry Number SK.129/Menlhk/Setjen/PLB.3/3/2020 concerning

the Permit for Utilization of Hazardous and Toxic Waste at PT Freeport Indonesia ([Rahayu, 2021](#)). This situation presents a significant opportunity where material that used to be considered waste, polluting the environment, can now be repurposed to accelerate infrastructure development. It starts with the efforts to securitize waste categorized as hazardous waste, which is then utilized as a material in infrastructure development.

PTFI initiated re-vegetation efforts in the tailing's deposition area back in 2005. To date, PTFI has successfully replanted 450 hectares of the tailing's deposition area. A recent report from Kompas illustrates how Freeport Indonesia's tailings deposition area, situated in the Estuary of the *Ajkwa* River, Mimika, Papua, has started a transformation, turning green as a result of the reforestation efforts ([Mewangi, 2022](#)). Currently, more than 900 types of vegetation have been documented on the former tailings land. This represents a substantial increase from the 2006 data collection, which was 500 plant species.

#### **4. Conclusion**

Based on the explanation above, we can conclude that security issues have expanded beyond traditional boundaries and are no longer limited to traditional concerns. Environmental issues are among the non-traditional challenges that demand attention from relevant stakeholders.

The case of Freeport's tailing waste has had significant impact on the surrounding environment. According to Indonesia's Law Number 32 of 2009 concerning Environmental Protection and Management, tailings waste is classified as hazardous and toxic waste. It falls under the category of waste that contains dangerous and/or toxic materials, which, due to their characteristics, concentration or quantity, may directly or indirectly harm or pollute the living environment or endanger human health.

This situation has prompted various parties, including from environmental activists and local indigenous communities, to exert pressure on the government to conduct an investigation. As mentioned earlier, environmental organizations such as WALHI and Greenpeace have called for government actions. Greenpeace, in particular, reported that PTFI was dumping more than 200,000 tons of tailings per day into the *Otomona* and *Ajkwa* Rivers, posing a potential threat to marine ecosystem in the area.

Equally important is how representatives of the *Kamoro* and *Amungme* indigenous tribes managed to mobilize the government in response to the situation. Both the actions of the tribes and the efforts of environmental activists constitute form of speech act that highlights Freeport's environmental damage through tailings, which they perceive as a threat. Consequently, they have sought to encourage the government to take more assertive stance, including advocating for the cessation of Freeport's production activities. This represents an emergency response to the situation. In terms of tailings waste management, it has evolved the use of this waste material in local public infrastructure development.

From this research, we can conclude that the discussion of securitization in the context of environmental issues needs to be more prominent. Given the limited and obscure results from the literature review regarding securitization and environmental issues in Indonesia, along with the qualitative method data collection method, there is a need for further studies on securitization efforts to address environmental problems in Indonesia. Such a study could offer an interesting alternative for problem-solving by framing environmental issues as threats to society, awareness among the public can be raised. It is hoped that more studies will be conducted on securitization in the context of environmental issues, prompting of environmental sustainability and advancing our understanding of subject.

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## References

- Araujo, F. S. M., Taborda-Llano, I., Nunes, E. B., & Santos, R. M. (2022). Recycling and Reuse of Mine Tailings: A Review of Advancements and Their Implications. *Geosciences*, 12(9), 319. <https://doi.org/10.3390/geosciences12090319>
- Asmarini, W. (2022, February 11). RI Bisa Makin Cuan, Produksi Emas di 2022 Digenjot Naik 20%! *CNBC Indonesia*. <https://www.cnbcindonesia.com/news/20220211140723-4-314737/ri-bisa-makin-cuan-produksi-emas-di-2022-digenjot-naik-20>
- Astuti, A. D. (2018). Implikasi Kebijakan Indonesia dalam Menangani Kasus Pencemaran Lingkungan oleh PT. Freeport terhadap Keamanan Manusia di Mimika Papua. *Journal of International Relations*, 4(3), 547–555.
- BPS. (2022). *Produksi Barang Tambang Mineral 2018-2020*. <https://www.bps.go.id/indicator/10/508/1/produksi-barang-tambang-mineral.html>
- Carmo, F. F., Lanchotti, A. O., & Kamino, L. H. Y. (2020). Mining waste challenges: Environmental risks of gigatons of mud, dust and sediment in megadiverse regions in Brazil. *Sustainability (Switzerland)*, 12(20), 1–13. <https://doi.org/10.3390/su12208466>
- Dahlius, A. Z. (2014, May 19). Potensi dan Tantangan Pertambangan di Indonesia. *Investor Daily*. <https://investor.id/archive/potensi-dan-tantangan-pertambangan-di-indonesia>
- ESDM. (2022). *Tahun 2021, PNPB dan Investasi Subsektor Minerba Lebih Target*. ESDM. <https://www.esdm.go.id/id/media-center/arsip-berita/tahun-2021-pnpb-dan-investasi-subsektor-minerba-lebih-target>
- Febriyani, N. (2019). Analisis kebijakan Indonesia penundaan dalam meratifikasi ASEAN Agreement on Transboundary Haze Pollution (AATHP) Tahun 2002 – 2014. *Jurnal Studi Diplomasi Dan Keamanan*, 11(2). <https://doi.org/10.31315/jsdk.v11i2.3136>
- Freeport McMoran. (2022). *Freeport-McMoRan Reports Second-Quarter and Six-Month 2022 Results*. [https://s22.q4cdn.com/529358580/files/doc\\_news/2022/FCX\\_220721\\_2Q\\_2022\\_Earnings\\_Release.pdf](https://s22.q4cdn.com/529358580/files/doc_news/2022/FCX_220721_2Q_2022_Earnings_Release.pdf)
- Hadiwinata, B. S. (2017). *Studi dan Teori Hubungan Internasional: Arus Utama, Alternatif, dan Reflektif*. Yayasan Pustaka Obor Indonesia.
- Haq, M. (1995). New Imperatives of Human Security. *World Affairs: The Journal of International Issues*, 4(1), 68–73. <http://www.jstor.org/stable/45064264>
- Indrawan, R. (2020, July 1). Hingga Mei, Kontribusi Freeport Ke Penerimaan Negara Baru 18% dari Target. *Dunia Energi*. <https://www.dunia-energi.com/hingga-mei-kontribusi-freeport-ke-penerimaan-negara-baru-18-dari-target/>
- Kusnandar, V. B. (2021a). *Berapa Jumlah Pekerja Freeport Indonesia?* <https://databoks.katadata.co.id/datapublish/2021/09/03/berapa-jumlah-pekerja-freeport-indonesia>
- Kusnandar, V. B. (2021b). *Kontribusi PT Freeport Indonesia Untuk Indonesia (1992-2020)*. <https://databoks.katadata.co.id/datapublish/2021/12/13/berapa-kontribusi-freeport-indonesia-untuk-indonesia>
- Maskur, F. (2021, February 14). Peluang! Freeport Buka Kerja Sama Pemanfaatan Tailing. *Bisnis*. <https://ekonomi.bisnis.com/read/20210214/44/1355988/peluang-freeport-buka-kerja-sama-pemanfaatan-tailing>
- Massola, J., & Rompies, K. (2018, April 26). Indonesia hits back over Freeport's Grasberg mine environmental claims. *Sydney Morning Herald*. <https://www.smh.com.au/business/companies/indonesia-hits-back-over-freeport-s-grasberg-mine-environmental-claims-20180425-p4zbns.html>
- Mewangi, M. (2022). *Menghijaukan Lahan Tailing, Mungkinkah?* Kompas. <https://interaktif.kompas.id/baca/menghijaukan-lahan-tailing-mungkinkah/>
- Nasution, A. D. (2017, March 8). Dua Suku di Papua Desak Pemerintah Tutup Tambang Freeport. *Katadata.Co.Id*. <https://katadata.co.id/yurasyahrul/berita/5e9a567a7d9af/dua-suku-di-papua>

- [desak-pemerintah-tutup-tambang-freeport](#)
- PTFI. (2021). *Riverine Tailings Management*. <https://ptfi.co.id/en/riverine-tailings-management>
- Rahayu, A. C. (2021, October 28). Investor luar negeri berminat kembangkan limbah tailing Freeport Indonesia. *Kontan*. <https://industri.kontan.co.id/news/investor-luar-negeri-berminat-kembangkan-limbah-tailing-freeport-indonesia>
- Rizaty, M. A. (2022). *Produksi Timah Indonesia Turun 37,2% pada 2021*. <https://databoks.katadata.co.id/datapublish/2022/01/10/produksi-timah-indonesia-turun-372-pada-2021>
- Rizki, M. J. (2019, January 9). Respons KLHK Soal Kerusakan Lingkungan Akibat Tambang Freeport. *Hukum Online*. <https://www.hukumonline.com/berita/a/respons-klhk-soal-kerusakan-lingkungan-akibat-tambang-freeport-lt5c35f52adc2c8/>
- Saturi, S. (2013, July 25). Laporan Greenpeace: Freeport Ancam Kelestarian Laut Indonesia. *Mangobay*. <https://www.mongabay.co.id/2013/07/25/laporan-greenpeace-freeport-ancam-kelestarian-laut-indonesia/>
- Setiawan, F. A., & Hapsari, F. P. (2017). Securitizing e-Waste: Framing Environmental Issue as a Threat to Human Security. *Jurnal Hubungan Internasional*, 6(2). <https://doi.org/10.18196/hi.62115>
- Silalahi, U., & Gunarsa, A. (2009). *Metode Penelitian Sosial*. Refika Aditama, 2009.
- Simanjuntak, R. A. (2015, December 9). Walhi Desak Pemerintah Audit Freeport Soal Lingkungan. *Sindonews*. <https://nasional.sindonews.com/berita/1068031/12/walhi-desak-pemerintah-audit-freeport-soal-lingkungan>
- Supar, E. (2018, August 8). Tokoh Desak Pemerintah Cabut KLH Tailing Freeport. *Antara Papua*. <https://papua.antaraneews.com/berita/469474/tokoh-desak-pemerintah-cabut-klh-tailing-freeport>
- Taberima, S., Junaedi, E., Sarwom, R., Lindongi, L. E., & Mulyanto, B. (2020). The acid mine drainage (AMD) impact of tailings and non-tailings on the ecosystem changes in the ModADA sedimentation area, Timika. *J. Degrade. Min. Land Manage*, 7(2), 2085–2094. <https://doi.org/DOI:10.15243/jdmlm.2020.072.2085>
- Tempo. (2020, December 19). *Tailing Freeport Dipakai untuk Bangun Infrastruktur Merauke*. <https://nasional.tempo.co/read/1415899/tailing-freeport-dipakai-untuk-bangun-infrastruktur-merauke>
- Trombetta, M. J. (2007). Reflexive securitization: the environmental sector and beyond. *Standing Group of International Relations (SGIR) 6th Pan-European International Relations Conference*.
- Winarno, B. (2017). The Value of International Regime and Global Environmental Crisis. *Jurnal Hubungan Internasional*, 6(1), 81–98. <https://doi.org/10.18196/hi.61107>