

DOI: <https://doi.org/10.31933/dijemss.v5i5>

Received: 29 May 2024, Revised: 10 June 2024, Publish: 13 June 2024

<https://creativecommons.org/licenses/by/4.0/>

## Latent Impact of Groundwater Exploitation by "PT X" from the Perspective of Green Criminology

Desti Desita<sup>1</sup>, Monica Margaret<sup>2</sup>

<sup>1</sup> Department of Criminology, Faculty of Social Sciences and Global Studies, Budi Luhur University, Jakarta, Indonesia, [2043500574@student.budiluhur.ac.id](mailto:2043500574@student.budiluhur.ac.id)

<sup>2</sup> Department of Criminology, Faculty of Social Sciences and Global Studies, Budi Luhur University, Jakarta, Indonesia, [monica.margaret@budiluhur.ac.id](mailto:monica.margaret@budiluhur.ac.id)

Corresponding Author: [2043500574@student.budiluhur.ac.id](mailto:2043500574@student.budiluhur.ac.id)

**Abstract:** Klaten has the nickname of the city of a thousand umbul, with good water quality making Klaten a place for AMDK companies to operate. This research aims to describe the latent impact of groundwater exploitation carried out by PT X based on the perspective of green criminology. Green criminology highlights various phenomena that have an impact on the environment and the interests of the wider community. With the rise of AMDK (Bottled Drinking Water) companies in the Klaten Regency area, it certainly has a lot of impact on the environment and the surrounding community. Various protests have been filed by the community in the hope that the community's interest in water for their agricultural land can be considered. This research was conducted using a qualitative method with data collection techniques through interviews with all parties involved, observation, and literature study. The data collected will be studied using the perspective of green criminology. The results of this research are expected to provide a new understanding for the wider community about how the impact caused by excessive exploitation of groundwater. It is also expected that the community can take part in the process of conserving groundwater so that the amount of groundwater supply.

**Keywords:** AMDK Company, Environmental Crime, Green Criminology, Groundwater, Groundwater Well.

## INTRODUCTION

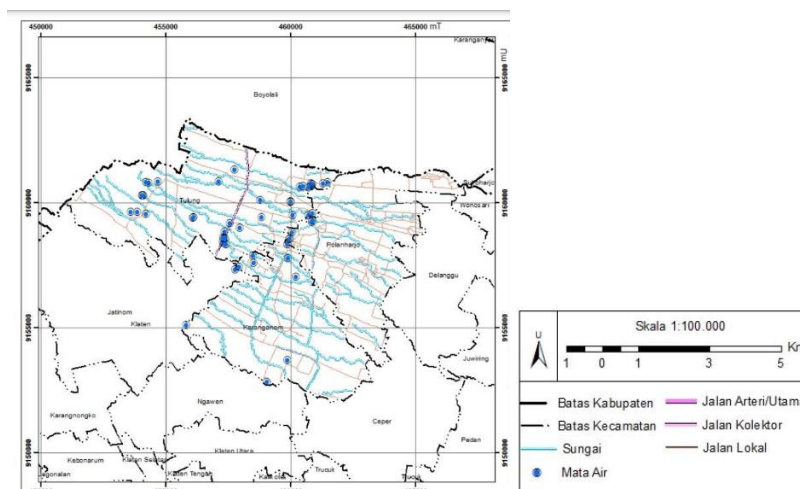
Water is one of the main needs that are important to support human life. Therefore, the preservation of water must be maintained in order to continue human life. Groundwater is water that is in the cavities of geological layers in a saturated state and in large quantities. Nowadays, the process of water utilization is carried out by utilizing the latest technology (Bisri, 2012). According to Hartoyo, the volume of water available as rainfall in Indonesia is 694 billion cubic meters in one year. In principle, this amount is a huge potential for exploitation, but in practice so far only about 23% has been exploited. This is due to various factors, including a decrease in river storage capacity due to environmental degradation, Indonesia's topographical conditions, and spatial disparities (Hartoyo, 2010). Of the 23

percent of water resources that have been exploited in Indonesia, about 20 percent is used to meet domestic raw water needs. The remaining 80 percent is used to meet irrigation needs. Exploration and development continue to be carried out to meet human water needs. However, exploration and utilization of groundwater must still pay attention to aspects of sustainability and protection of groundwater resources, as well as control and restoration of environmental damage in accordance with applicable regulations. In addition, efforts to conserve and maintain groundwater require participatory management, where communities are actively involved and support groundwater management practices (Rejekiningrum, 2009).

**Table 1. Total Distribution of Springs in Klaten District**

| No    | District      | Number of Water Springs |
|-------|---------------|-------------------------|
| 1     | Prambanan     | 11                      |
| 2     | Gantiwarno    | 5                       |
| 3     | Wedi          | -                       |
| 4     | Bayat         | 4                       |
| 5     | Cawas         | -                       |
| 6     | Trucuk        | 2                       |
| 7     | Kalikotes     | 11                      |
| 8     | Kebonarum     | 14                      |
| 9     | Jogonalan     | 6                       |
| 10    | Manisrenggo   | 24                      |
| 11    | Karangnongko  | 17                      |
| 12    | Ngawen        | 16                      |
| 13    | Ceper         | 8                       |
| 14    | Pedan         | 2                       |
| 15    | Karangdowo    | -                       |
| 16    | Juwiring      | -                       |
| 17    | Wonosari      | 1                       |
| 18    | Delanggu      | -                       |
| 19    | Polanharjo    | 6                       |
| 20    | Karanganom    | 8                       |
| 21    | Tulung        | 24                      |
| 22    | Jatinom       | 3                       |
| 23    | Kemalang      | 2                       |
| 24    | South Klaten  | 5                       |
| 25    | Center Klaten | -                       |
| 26    | North Klaten  | 5                       |
| Total |               | 174                     |

Source: Klaten District Public Works and Spatial Planning Agency, 2015



Source: RBI Map of Klaten Regency, 2017

**Figure 1. Map of Spring Distribution on the Eastern Slope of Mount Merapi, Klaten Regency**

Klaten Regency is located at the foot of Mount Merapi and Mount Merbabu, which causes Klaten to have natural wealth in the form of very abundant groundwater. Klaten is one of the water catchment areas of the slopes of Mount Merapi. Klaten is nicknamed the city of a thousand umbul, this natural wealth is utilized by the community as a source for irrigation used for fisheries and agriculture, household needs, and tourism (Anggraheny, Aristin, & Kartika, 2020). Based on the records of the Klaten District Public Works and Spatial Planning Office (2015) Klaten has 174 springs. Based on these records, the largest number of springs is in Manisrenggo Subdistrict and Tulung Subdistrict with a total of 24 springs. Meanwhile, there are 5 sub-districts that do not have springs.

With so many springs in Klaten, in the 1920s Umbul Kapilaler was utilized by the Dutch to supply the water needs of the Ceper sugar factory. The Dutch built an underground water channel that was estimated to be completed in the 1930s. Umbul Kapilaler itself comes from the word Capillair, but the local people simplify it to Kapilaler. The water from Umbul Kapilaler flows through the Capillair aqueduct which flows to the Ceper area. But after the Ceper sugar factory closed in 1997, this water channel was abandoned, and is now called the Gejikan River or DI Kapilaler (Indriastuti & Muktiali, 2015). Initially, Umbul Sighedang and Umbul Kapilaler springs were only utilized by residents for household purposes such as washing and bathing. While the water flow from Umbul Kapilaler is channeled through the Gejikan River to the Cawas District area. Gejikan River is an artificial river that was built during the colonial era to fulfill the water needs of the Dutch sugar cane factory. Until now, the Gejikan River is utilized for agriculture, fisheries, and tourism.

Until the beginning of 2000, the population in Klaten Regency had difficulty finding employment. Given that Klaten Regency has many springs, several letters were sent to various AMDK (Bottled Drinking Water) brands in the hope that the company could set up a factory in the Klaten Regency area and could open new jobs for the surrounding community. In the end, one of the AMDK companies was interested and established its factory in Klaten Regency. AMDK company "PT X" which has been operating since 2002. PT X utilizes water around Umbul Sighedang and Umbul Kapilaler which are located next to each other, by making wells with a depth of 40 meters below the aquifer (Jaryanto, 2024). PT X utilizes water at 60 liters per second and 45 liters per second (Irwan, 2023). According to Jaryanto, PT X operates in the Klaten Regency area on the condition that it can provide jobs for the surrounding community. So that until now PT X employees are dominated by local residents, except for experts who are brought in from outside Klaten Regency. With this agreement, it is hoped that it can provide welfare for the surrounding community, but many other problems have been caused after the operation of PT X in the Klaten Regency area (Jaryanto, 2024).

Green criminology focuses on events related to the environment and events that have a negative impact on the environment. Research from green criminology aims to uncover various forms of social and ecological injustice. It is designed to manage, protect, and preserve the environment and certain species, as well as manage the negative impacts of the industrialization process (White & Heckenburg, 2014). The coherence between criminology and environmental issues has led to growing concerns about environmental sustainability. The concept of Green Criminology was born with an ecological approach that focuses on broader issues of environmental sustainability and environmental destruction, by applying ideas about environmental ethics, ecology, and human rights. With that, green criminology is used as a foundation for solving environmental crimes (White & Heckenburg, 2014).

## METHOD

In this study, the authors used qualitative research methods. This qualitative research method is research that relies on the subjective assessment of the researcher's attitudes, opinions, and behavior (Kusumastuti & Khoiron, 2019). Qualitative research uses data from

various sources. Some of them are interviews and observations. Interviews and observations are the most common sources of information used by researchers in completing qualitative research. For the sources of this research, there are 3 (three) research objects, 1 (one) former employee of the AMDK company, 1 (one) informant from the Klaten Regency PUPR Office, 1 (person) initiator of the establishment of an AMDK company in Klaten Regency. Qualitative research involves a variety of analytical and interpretative procedures used to gain insight and theory. The results of this qualitative research can take several forms, including written and oral results. Examples of products from qualitative research are scientific journals and scientific conferences (Nasution, 2023). Therefore, this paper is expected to be part of a scientific journal.

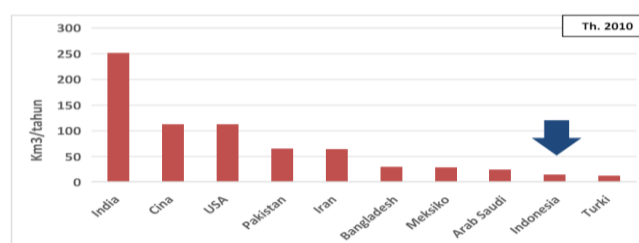
The type of research used by researchers in this study is descriptive qualitative, which is a research format that belongs to the qualitative research paradigm. Descriptive research focuses on the study of phenomena in the lives of individuals or groups. The author observed various protests carried out by the community in Klaten Regency against AMDK companies operating in the region. This research was conducted in a span of about 9 months, starting from August 2023 to May 2024. This research was conducted by the author in Klaten Regency, Central Java. The community's unrest is contained in various writings, one of which is an appeal for the fleet transporting the AMDK company's production not to pass through the roads around residential areas because the heavy loads carried by the PT X production fleet can damage the road and it is feared that it can threaten the safety of other road users (Muhana, 2023). Farmers who complained about experiencing a shortage of water supply to irrigate their agricultural land after the operation of PT X AMDK company (Syauqi, 2023).

People from various backgrounds ranging from farmers to MSME entrepreneurs who feel the impact are members of an alliance that sues the PT X AMDK company. From a lack of water supply can provide misery for the community. According to (Beirne & N., 2007) provides a broader conceptualization of green crime. That green crime involves the study of adverse impacts on humanity, the environment (including space) and non-human animals committed by powerful institutions, including governments, transnational corporations, military forces) and can also be committed by ordinary people. From the above phenomenon, it is worth investigating who is responsible for the various unrest experienced by the community. The data obtained was analyzed by the researcher and compiled into a chronological narrative.

## RESULTS AND DISCUSSION

### Groundwater Utilization

Initially, people used river water to fulfill household needs. However, along with the contamination of river water, the community must find other alternatives to meet their needs. Thus, to meet their needs, people utilize groundwater (Nuraini & Sari, 2023). As the human population continues to increase, the rise of industrialization has an effect on the amount of groundwater use which continues to increase. This section must answer the problems or research hypotheses that have been formulated previously.



Source: Geological Agency, Ministry of Energy and Mineral Resources, 2024

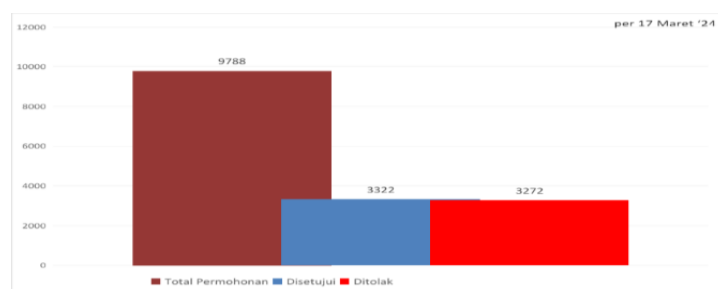
**Figure 2. Total Groundwater Withdrawal Indonesia vs World**

Quoted from (its.go.id, 2024), according to data taken from the Geological Agency, Ministry of Energy and Mineral Resources, in 2010 the amount of groundwater use in Indonesia ranked 9th largest in the world. After India, China, the United States, Pakistan, Iran, Bangladesh, Mexico, and Saudi Arabia. The groundwater taken is utilized to meet domestic and industrial needs (its.ac.id, 2024). Groundwater withdrawal in Indonesia has been regulated by Law Number 17 of 2019 concerning Water Resources to replace Law Number 7 of 2004 which was canceled by the Constitutional Court after it was declared that it still had shortcomings and could not regulate as a whole with regard to the management of water resources in accordance with the development and legal needs of society. This law was issued for the purpose of state protection of the community's need for water. As stated in Article 5 of Law Number 17 of 2019 and Article 6 of Law Number 17 of 2019.

Quoted from the official website, (Directorate General of Water Resources, Ministry of PUPR, 2015) the utilization of water resources has basic principles and limitations in its management, including the following:

1. The exploitation of water must not interfere with, override, or negate the people's right to water.
2. The state must fulfill the people's right to water. Access to water is a separate human right.
3. Environmental sustainability, as one of the human rights, in accordance with Article 28 H paragraph 1 of the 1945 Constitution.
4. Supervision and control by the state over water is absolute.
5. The main priority given to the exploitation of water is State-Owned Enterprises (BUMN) or Regional-Owned Enterprises.
6. If after all the above restrictions have been met and it turns out that there is still water availability, it is still possible for the government to grant licenses to private businesses to exploit water under certain and strict conditions.

Excessive exploitation of groundwater will have a negative impact on the environment. As has happened in Semarang, Central Java, land subsidence has occurred due to excessive groundwater utilization and exceeding its capacity (Grehenson, 2023). Therefore, a Decree of the Minister of Energy and Mineral Resources (MEMR) number 291.K/GL.01/MEM.G/2023 on Standards for the Implementation of Groundwater Use Approval was enacted. Based on this decision, government agencies, legal entities, social institutions, and communities must have a permit as a condition for utilizing groundwater in the form of boreholes and dug wells (Nuraini & Sari, 2023).



Source: Geological Agency, Ministry of Energy and Mineral Resources, 2024

**Figure 3. Graph of Groundwater Extraction Permit Applications**

Based on records from Mineral Resources, by 2024 there will be 9,788 applications for new groundwater wells. Of the 9,788 applications, 3,322 have been approved, while a total of 3,272 have been rejected. This is a very small number compared to the number of illegal groundwater exploitation. As stated by Dr. Ediar Usman, Head of the Center for Groundwater and Environmental Geology at a webinar organized by ITS, the Geological Agency estimates that until 2024 there will be 35,000 illegal uses of groundwater (its.ac.id, 2024).

## The Impact of Groundwater Exploitation in Klaten Regency According to Green Criminology

Lynch originally defined green crime as (Lynch, 1990):

1. Harm inflicted on living beings through the creation of environmental hazards.
2. Exists at both local and global levels.
3. Effects associated with corporate and state crime.
4. As a subject matter of radical criminology and political economy theory/analysis, and its attention to class analysis.

Green criminology highlights various phenomena related to the environment and their impact on the environment and justice for all living things. As in the case of water resource utilization in Klaten Regency. Indeed, after the operation of the AMDK company in Klaten district, it caused various protests from the community. The presence of the company caused losses to farmers because the availability of water was significantly reduced. Protests by farmers who are members of the People's Coalition for Justice (Kraked). The farmers said water supply for agriculture was still limited in their area, even during the rainy season. The farmers suffered from water shortages and decreased agricultural production (Anhari, 2023). Around 2004, there were 7 sub-districts that experienced water shortages, including: Polanharjo, Ceper, Pedan, Wonosari, Juwiring and Karanganyar. They believed that the drought phenomenon was caused by the fact that springs that were supposed to irrigate irrigation areas had been used to fulfill commercial interests, leaving farmers' needs for water aside (Rosyid, 2004). The water withdrawal permit granted to PT X at the AMDK factory located in Ponggok Village, Polanharjo Subdistrict is 23 liters/second. However, when it was first installed, the water discharge was 86 liters/second, but the amount of water withdrawn has been reduced to 65 liters/second. Based on recognition from PT X in 2004, the water withdrawn was used for purposes other than manufacturing and the amount of public water used was only 13 liters/second. However, another source states that PT X's permit in 2004 was 32 liters/second. In reality, it was only 15 liters/second, after measuring it was 86 liters/second (Muslimah, Noer, & Badriah, 2007).

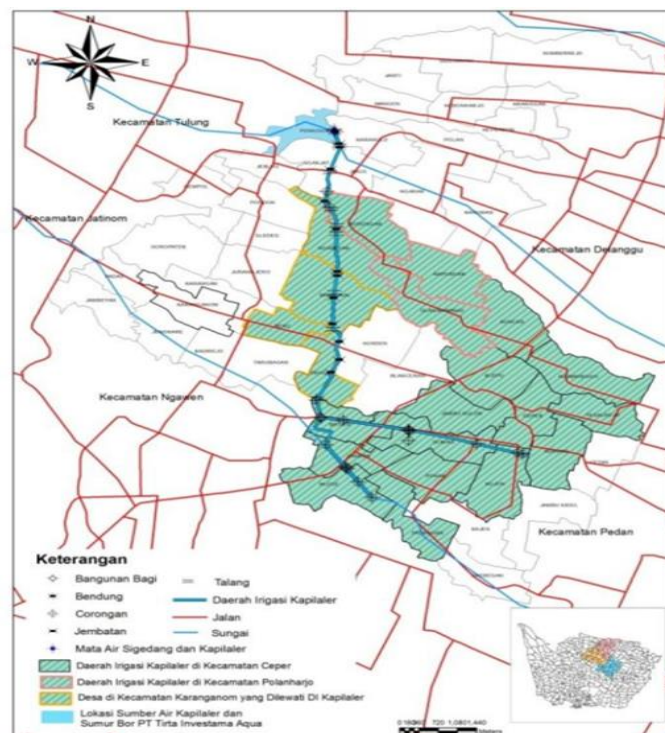


Figure 4. Kapilaler Irrigation Area in Polanharjo Sub-district - Ceper Sub-district

The amount of water taken by PT X greatly affects the amount of water released by Umbul Sighedang and Umbul Kapilaler. This is because PT X's borehole is located very close to Umbul Sighedang and Umbul Kapilaler which are located in Dukuh Umbulsari, Ponggok Village, Polanharjo District, Klaten Regency (Muslimah, Noer, & Badriah, 2007). While the existence of Umbul Kapilaler is very important for farmers located in 5 sub-districts. Among them are Polanharjo District, Karanganom District, Pedan District, Ceper District, Trucuk District, and Cawas District (source: Klaten District Public Works Office, 2004). According to data from the Central Java Water Resources Management Agency (BPSDA) in 2001, Sighedang spring discharge was 273 liters/second. Which in that year there were not many AMDK companies operating in Klaten Regency. According to the DPU of Klaten District, the ideal flow rate to irrigate 415 hectares of agricultural land is 394 liters/second. Meanwhile, the solution to the water deficit of 121 liters/second has been overcome by turning the flow. Field measurements by the People's Coalition for Klaten Justice (KRAKED) in August 2004 showed that the water discharge upstream of the capillary irrigation network was only  $\pm 150$  liters/second, from the original capacity of 273 liters/second. This shows that there has been a 45% reduction in discharge compared to when the PT X AMDK company was not yet operating in the Klaten Regency area. While in the middle of the Kapilaler Irrigation Area after measurement there is only 30 liters / second. Which of this runoff will only flow from agricultural land up to 30 hectares, assuming a flow rate of 1 liter / second per 1 hectare of land. The deficit of 121 liters/second of water discharge for irrigation needs is enough to make the Klaten District Government not to recommend the operation of PT X in the development of water around Kapilaler Spring and Sighedang Spring (Muslimah, Noer, & Badriah, 2007).

According to Widodo, protests have been ongoing regarding the water shortage. In an effort to increase the amount of water supply in the Kapilaler Irrigation Area, the managers of Umbul Sighedang and Umbul Kapilaler tried to increase the water supply for the Gejikan River by draining water from Umbul Kapilaler. It is believed that the cause of the reduced water supply is due to the proliferation of wells in the Klaten Regency area, especially Polanharjo District, which is very influential. In an effort to maintain the amount of water discharge, the community is trying to do greening in the slope area of Mount Merapi. That is because Klaten is a catchment area of Mount Merapi. Thus, if the slopes of Mount Merapi experience deforestation, the amount of water supply to the Klaten Regency area will also decrease (Widodo, 2024).

## CONCLUSION

The natural wealth in the form of many springs owned by Klaten Regency ultimately provides unrest for the surrounding community. After the operation of the AMDK industry in Klaten Regency, the water supply was significantly affected. After the operation of PT X, protests were rampant by the local community, especially farmers who experienced water shortages for their agricultural land. Environmental crimes are often overlooked by the wider community, because the effects are only felt in the long term, even though the impacts are very dangerous for the environment and all living things in it. According to Michael J. Lynch, one of the Green Criminology figures, environmental crimes are committed by transnational companies, governments, or individuals. In this case, both the company and the government as the licensor must take action in accordance with what is expected by the community. An environmental crime has an impact not only on humans, but on the environment and all living things in it. Therefore, green criminology is present to fight for the rights of the community and also as an effort to maintain the environment so that it remains sustainable for the future. Water is a necessity for humans, whose existence must be explored. However, groundwater extraction that is continuously exploited can lead to catastrophe for future generations. If

natural resources continue to be extracted by the private sector, how will the implementation of Article of Law No. 17/2019, which states that water resources are controlled by the state and used for the greatest prosperity of the people. While the community continues to echo its unrest, without any solution.

From the results of research like this, it is hoped that it can trigger awareness from various levels of society so that the unrest experienced by the people in Klaten Regency will immediately receive attention. All forms of exploitation of water and anyone who does so is expected to be immediately given strict action in accordance with applicable laws and regulations. Groundwater extraction must be carefully calculated, so as not to cause various adverse impacts on society today and in the future.

## REFERENCE

- Anggraheny, K. R., Aristin, N. F., & Kartika, N. Y. (2020). Pemetaan Sebaran Dan Deskripsi Potensi Obyek Wisata Umbul. *Jurnal Teori dan Praksis Pembelajaran IPS*, 79-91.
- Beirne, P., & N., S. (2007). Approaching green criminology. *Issues in green criminology: Confronting harms against environments, humanity and other animals*, 13-22.
- Bisri, M. (2012). *Air Tanah*. Malang: Universitas Brawijaya Press.
- Dwijayanti, S. A. (2018). Analisis Pola Persebaran dan Karakteristik Mata Air Di Lereng Timur Gunungapi Merapi Kabupaten Klaten. 1-16.
- Grehenson, G. (2023). *Pakar UGM: Penurunan Tanah di Jakarta dan Semarang Perlu Ditangani Secara Komprehensif*. Yogyakarta: ugm.ac.id.
- Indriastuti, W., & Muktiali, M. (2015). Commons Dilemma pada Pengelolaan Daerah Irigasi Kapilaler. *Jurnal Wilayah dan Lingkungan*, 105-120.
- Irwan, M. (2023). *Ratusan Warga Demo Tuntut Evaluasi Keberadaan Pabrik Aqua di Klaten*. Klaten: Pikiran Aceh.
- Jaryanto, M. (2024, May 3). Bagaimana Sejarah Beroperasinya PT X di Kabupaten Klaten. (D. Desita, Pewawancara)
- Kementrian Pekerjaan Umum dan Perumahan Rakyat. (2015, October 9). *Berita SDA*. Diambil kembali dari Direktorat Jendral Sumber Daya Air: [https://sda.pu.go.id/berita/view/implikasi\\_batalnya\\_uu\\_sda\\_bersifat\\_retroaktif\\_dan\\_prospektif#:~:text=Mahkamah%20Konstitusi%20\(MK\)%20mengeluarkan%20putusan,hak%20penguasaan%20negara%20atas%20air](https://sda.pu.go.id/berita/view/implikasi_batalnya_uu_sda_bersifat_retroaktif_dan_prospektif#:~:text=Mahkamah%20Konstitusi%20(MK)%20mengeluarkan%20putusan,hak%20penguasaan%20negara%20atas%20air).
- Lynch, M. J. (1990). The greening of criminology: A perspective for the 1990s. Reprinted in N. South & P. Beirne (Eds.), *Green criminology*. Hampshire: Aldershot.
- Kusumastuti, A., & Khoiron, A. M. (2019). *Metode Penelitian Kualitatif*. Semarang: Lembaga Pendidikan Sukarno Pressindo (LSPP).
- Muslimah, F. Y., Noer, A., & Badriah, L. S. (2007). Valuasi Ekonomi Dampak Eksploitasi Air Tanah Oleh PT. Tirta Investama Terhadap Sektor Pertanian Di Kecamatan Trucuk Kabupaten Klaten. *Jurnal Eko-Regional*, 59-66.
- Nasution, A. F. (2023). *Metode Penelitian Kualitatif*. Bandung: CV Harva Creative.
- Nuraini, R., & Sari, E. I. (2023, November 6). *Kependudukan*. Diambil kembali dari Indonesia.go.id: <https://indonesia.go.id/kategori/kependudukan/7720/aturan-baru-pengambilan-air-tanah?lang=1>
- Pusat Air Tanah dan Geologi Tata Lingkungan*. (2024, March 22). Diambil kembali dari its.ac.id: [https://www.its.ac.id/tgeofisika/wp-content/uploads/sites/33/2024/03/Materi-Webinar-Teknik-Geofisika-ITS\\_Tantangan-Pengelolaan-Air-Tanah-dalam-Menghadapi-Perubahan-Iklim.pdf](https://www.its.ac.id/tgeofisika/wp-content/uploads/sites/33/2024/03/Materi-Webinar-Teknik-Geofisika-ITS_Tantangan-Pengelolaan-Air-Tanah-dalam-Menghadapi-Perubahan-Iklim.pdf)
- Rejekiingrum, P. (2009). Peluang Pemanfaatan Air Tanah Untuk Keberlanjutan Sumber Daya Air. *Jurnal Sumberdaya Lahan*, 85-96.
- Rosyid, I. (2004). *Petani Klaten Minta Pabrik Aqua Ditutup*. Klaten: Tempo.

- White, R., & Heckenburg, D. (2014). *Green Criminology An introduction to the study of environmental harm*. Abingdon: Routledge.
- Widodo. (2024, April 29). Bagaimana Pengaruh Industrialisasi PT X Terhadap Masyarakat Sekitar. (D. Desita, Pewawancara).