Riwayat: Educational Journal of History and Humanities, 6 (1), 2023, pp. 133-143
P-ISSN: 2614-3917, E-ISSN: 2775-5037
DOI: https://doi.org/10.24815/jr.v6i1.29460

Government Policies in Addressing Land Subsidence Dynamics in Tambakrejo Semarang

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Article history
Received : 2022-08-21
Accepted : 2022-09-08
Published : 2023-01-14

Keywords:
Subsidence, Government, Tidal Flood, Policy

Abstract: Annual land subsidence in Tambakrejo Semarang has decreased by 10 to 13 centimeters. However, the government has not adopted any meaningful policies. This article aims to investigate how many government policy measures have been implemented to address land subsidence in Tambakrejo, Semarang. This article is thus written using an empirical judicial method in which the researchers do direct field observations, interview informants, and collect data from numerous journals. The results acquired and the impact on the Tambakrejo community of material and immaterial losses caused by subsidence. The government's policies have been implemented, however they have been less effective for the people of Tambakrejo.

Abstrak: Penurunan tanah yang terjadi di Tambakrejo Semarang mengalami penurunan sebanyak 10 sampai 13 cm tiap tahunnya. Namun, belum ada kebijakan efektif yang dilakukan oleh Pemerintah. Tujuan penulisan ini untuk mengetahui seberapa banyak langkah kebijakan pemerintah sebagai upaya penanganan subsidensi tanah di Tambakrejo Semarang. Metode dari penulisan ini adalah metode yuridis empiris dimana peneliti melakukan observasi di lapangan secara langsung, pengumpulan fakta melalui wawancara terhadap narasumber dan pengumpulan data dari berbagai jurnal. Hasil yang didapatkan, dampak yang dirasakan masyarakat Tambakrejo terhadap kerugian dari subsidensi kerugian materil dan imateril. Adapun kebijakan yang telah dilakukan oleh pemerintah, namun kurang efektif untuk masyarakat Tambakrejo.

INTRODUCTION

It is anticipated that climate-related disasters would drastically alter global migration patterns. Changes in migratory patterns are anticipated to increase the frequency and severity of chronic environmental damage and unexpected disasters. Due to variables such as the intensification of extreme weather events, the rise in sea level, and rapid environmental degradation, it is anticipated that climate change would increase population migrations. The impact of climate change on livelihoods, public health, nutrition, security, and water availability is negative. Many people of Java's coastal cities, like as Jakarta, Semarang, and Pelo-ngong, face everyday flooding. Rising waters during high tide can inundate drainage systems, causing damage to houses, roads, and public transportation (Ley,2021). If a location is permanently below sea level, it remains underwater.

Available online at
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In Semarang, a large port city of 1.7 million people, high tides regularly produce riots, the local word for high tide. Rob is an undesirable excess of water that, ideally, should not occur in highly populated metropolitan settings. In recent years, however, both governments and coastal communities have found it incredibly difficult and intimidating to counter piracy. Adjustments to the infrastructure, such as raising roads and damming rivers, can provide temporary solutions for containing the ever-increasing volume of water, but ultimately these facilities have failed to contain the water output and volume of water. In an impoverished area in the north like Kaligawe, it appears hard to prevent the intrusions and tides (tide of robbery) (Krause & Harris,2021).

Eliminating sea level rise in the form of rob is very difficult to overcome, because most of the land in inhabited Indonesia lies below sea level and is trapped in the process of inevitable subsidence, intense accumulation, and groundwater discharge, resulting in land subsidence which is quite huge. Therefore, in the subject of tidal flooding, it can be argued that the land is reducing daily, not the sea water, which is rising, but the land on the Semarang coast, which is declining daily. Heri Andreas, a surveyor from the Bandung Institute of Technology, has demonstrated that the ground around the shore of Semarang sinks an average of 10 centimeters each year and up to 20 centimeters per year in some areas. Therefore, Heri Andreas theorized that ground subsidence contributed to North Semarang's vulnerability to tidal flooding and the possibility of drowning.

According to these statistics, Semarang has the second-fastest land subsidence in the world. According to Heri's research, there are four reasons why the land in North Semarang has shrunk: the soil in the main Semarang area is becoming softer and more brittle, which will scientifically result in the level of subsidence in the soil; furthermore, the burden on the land in northern Semarang is quite heavy due to the expansion of infrastructure; and lastly, the land in northern Semarang has been subjected to a significant amount of abrasion (Suhelmi & Prihatno,2014).

Patria Rizky Ananda, a science manager for WALHI in Central Java, determined that factories and industrial areas on the Semarang coast contribute to the exploitation of groundwater by drilling groundwater for industrial purposes, given that the majority of factories and industrial areas in Semarang are located on the coast of North Semarang. It should be noted that there has been a ban on the use of groundwater for the Semarang area regarding groundwater management, but until now the implementation of this regional regulation has not been maximally applied even though the PDAM water subsidy has oversupplyed this regulation as stated in Regional Regulation No. 3 of 2018, so there is a discrepancy here towards government policies with the reality that occurs in the field which raises questions about the proportionality of the regional regulations that have been made (Setiyawan,2022).

There is a lack of government oversight on the permits and processes for these industrial companies, particularly those that use groundwater.

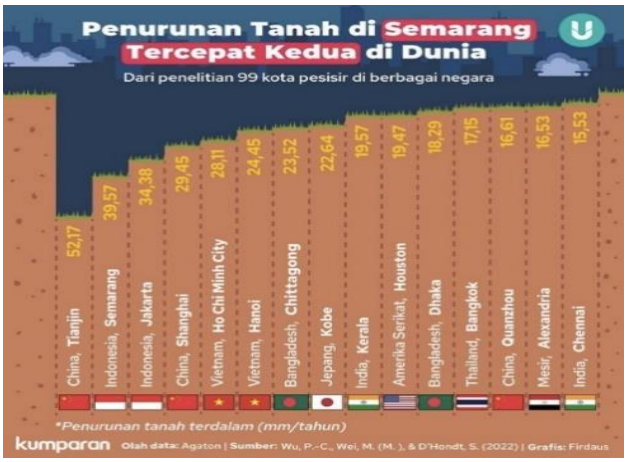

Figure 1. Land subsidence in Semarang is the fastest in the world

The water level in the region of Tambakrejo is rising daily, and seawater is rapidly seeping into the dwellings and residential areas of people, submerging 12 meters of residential areas. Residents of the Tambokrejo Fisherman's Village watched as their homes were slowly eroded by rising sea levels. Since the 2000s, the lives of the residents of the Fisherman's Village have not been the same; they have been haunted by the increase in water discharge, especially during the rainy season, and even their home, the public cemetery, which is the final resting place of humans, has been eroded.

The public cemetery was constructed in 1998, but it was drowned by water in 2000, forcing the cemetery's family to relocate the bodies of their loved ones who should have lain in peace. Some locals who do not move the bodies of their families are required to memorize the position of their family graves using a tree as a guide, and when they want to make a pilgrimage, they must use a boat to drop flowers and pray while on the water. In addition to pools of seawater, Tambakrejo Nelayan Village is also littered with a great deal of plastic debris. The majority of Tambakrejo's people are fisherman, and they are concerned that environmental degradation would negatively impact their fish production.

Until now, the residents of the fishing village have not wanted to move from their homeland because they are worried about losing their main livelihood, namely fishing. So that every year the residents of the Fisherman's Village have to raise their houses 1 meter to 1.5 meters per year at a minimum cost of 40 million, while residents who don't have money are forced to have their houses drown in water. From the problems that have been described, there is no solution or movement from the government that is maximal in nature to respond to this problem that has been going on for a long time, while residents have lost their homes one by one. So that it can be said that the government does not uphold the requirements of government administration, namely mandatory efficiency, where they should pursue optimally with high productivity, because this problem already covers many of the interests of the rights of Indonesian citizens.

What is the government's policy for addressing the dynamics of land subsidence in Tambakrejo, Semarang, which is daily swamped by sea water and where people' homes are being consumed by water? The residents of the fishing town have resisted leaving their home because they fear losing their primary source of income, which is fishing. What is the impact of the land subsidence phenomena in Tambakrejo Semarang on the community? Residents of Fisherman's Village must raise their homes by 1 to 1.5 meters per year at a minimum cost of 40 million rupiah, while others without sufficient funds must watch their homes sink into the water. From the problems described, there is no perfect solution or government response

to this long standing issue, and inhabitants have lost their homes one by one.

However, what are the Semarang government's political policies regarding the phenomena of land subsidence in Tambakrejo Semarang? It is reasonable to say that the government does not uphold the requirements of government administration, namely mandated efficiency, which they should pursue as optimally as possible with high productivity, given that this issue already affects a great number of the rights of Indonesian citizens.

METHOD

This study was discussed using empirical juridical research methods in which researchers made observations in the field directly by gathering facts through interviews with related sources and collecting data from various journals, researchers used applicable legal regulations and then correlated with the fact data obtained by obser-vation results that have occurred in the midst of people's lives. Legal materials consist of law books, journals, articles, and online sources related to environ-mental law and state administrative law.

RESULTS AND DISCUSSION

The Impact of the Land Subsidence Phenomenon in Tambakrejo Semarang on Society

Soil subsidence, as the movement of the soil surface under downward pressure, is a major constraint to development in many regions around the world (Prasetyo&Subiyanto,2014). This can damage existing buildings, roads, bridges, industrial areas, and result in loss of homes, even causing injury or loss of life. Many urban areas in Indonesia, such as Jakarta, Bandung, and Semarang are experiencing land subsidence. Land use patterns and the physical environment in Semarang have changed rapidly. Changes in land use that occurred in the upper and lower Semarang areas are now getting out of control. These events often overlook the environmental capacity of the system. Housing growth, industrial expansion, and agriculture in low-lying areas are contributing to land subsidence and the area affected is increasing every year.

The focus of this discussion is land subsidence in Tambakrejo. Tambakrejo village was affected by one of the worst subsidences in Semarang. The land subsidence at Tambakrejo Semarang was between 10 and 18 centimeters (Herlambang , 2021). The land has turned into the ocean, several areas and residential areas have disappeared and have been submerged in water, especially the Tanjung Mas area where public cemeteries are also submerged in sea water. This incident left grief for the families whose houses were submerged in sea water and the graves of residents who were submerged in sea water. This is contrary to the goals of the Indonesian state and the provisions of the highest source of law in Indonesia. Communities have the right to live and have a decent and healthy place to live as stated in the 1945 Constitution of the Republic of Indonesia article 28H.

There are multiple causes of land subsidence in Tambakrejo Semarang, including groundwater extraction, the natural consolidation of alluvium soil, and the excessive use of land by irresponsible parties governed by Law No.4 of 1982 and Law No. 23 of 1997 regarding land subsidence caused by infrastructure development and construction loads. The leading cause of land subsidence is soil compaction in certain aquifer systems coupled with excessive groundwater pumping. In addition, modifying the drainage system is likely to

cause further, less obvious, slow-developing difficulties. Due to the rising water level near the river's mouth, field drainage and canals may sink. Soaking limits drainage capacity and can cause difficulties with waterlogging and Salinization (Archenita,2015)

Figure 2. Condition of Land Subsidence Victims in Tambakrejo Subsidence in Tambakrejo Semarang

certainly has an impact on numerous aspects of one's life. Tambakrejo Semarang's soil subsidence has a significant effect on regional activity. Multiple impacts of land subsidence can be observed, including increased floods, damage of residential areas, and land that is lower than the water level. Obviously, ground subsidence has detrimental effects on the Tambakrejo community's ability to carry out daily activities, such as a lack of a clean and healthy environment. Destruction or submersion of buildings and infrastructure by seawater resulted in severe economic losses. This deteriorated the living conditions of the immediately affected population. In fact, some Semarang Tambakrejo areas sank and took life. Tambakrejo, Semarang, which is not yet drowned, will likely be submerged if this phenomena is not addressed with considerable adaptation and mitigation measures.

Cases that have occurred during the previous four decades have been approached in a number of ways. The government transferred 97 families from the Tambakrejo Semarang community in accordance with Law No. 26 of 2007. (Ivars,2007) The government's actions in the Tambakrejo land subsidence case were disproportionate, there was no guarantee of human rights in the forcible removal of individuals, and the community naturally rejected the government's efforts because there was no assurance of land ownership rights and no compensation.

The government as a policy maker has made preventive and integrated efforts to manage and protect the environment to prevent environmental damage and preserve its functions. The Semarang City Government has established Central Java Regional Regulation No. 3 of 2018 article 12 prohibiting the use of groundwater. However, the people of Tambakrejo Semarang drill groundwater for their daily needs and as many as 37 factories around Tambakrejo use groundwater for their daily operational needs. Excessive and continuous drilling of groundwater certainly contributes to soil subsidence. The path taken by the government to reduce the occurrence of cases of land subsidence that occurred in Tambakrejo Semarang is distributing PDAM water and providing clean water assistance to the community. with Law no. 32 of 2009 article 1 number 2.

The government will be in vain if it does not supervise the factories in Tambakrejo, Semarang. This is because there are 37 factories around Tambakrejo using ground water which contributes to soil subsidence. The government's weak implementation of supervising the running of activities in industrial factories, in this case, has included a ban on groundwater management in Presidential Regulation No. 82 of 2001. As a result of this condition sine qua non and the government's negli-

gence, the Tambakrejo Semarang community lost their homes and made efforts to raise the house to spend up to Rp. 40,000,000.00 each year. There is a need for repressive efforts to enforce the law on environmental protection and management for anyone who violates it must be given a penalty based on Law No. 32 of 2009 through administrative law enforcement, investigations into environmental crimes, and settlement of disputes outside the court.

The people of Tambakrejo Semarang are not just silent about big events like this. Semarang State University together with the Tambakrejo Semarang community created a community engaged in abrasion handling at Pesisi Semarang which was formed on December 2 2011 which was named CAMAR. The community and the CAMAR group are aware of and care about the surrounding environment, which is increasingly concerned about water having devoured several residents' houses. As an effort to deal with this, the CAMAR group pioneered the planting of mangroves.

The issue of land subsidence is becoming increasingly complex and difficult to manage effectively. These signs are reflected in the deteriorating condition of the ecosystem. The fact that the Tambakrejo consume groundwater and dispose of trash in their dwellings frequently results in health problems. In addition, bites from snakes are a common form of snake attack. (Setyono, 2022) Losses from reduced subsidence include the occurrence of health hazards or negative effects, immaterial, material losses (costs used to raise houses or destroyed houses), and the natural balance does not work as it should. (Guzy & Malinowska,2020) The right to a healthy environment is one of the basic rights enshrined in the 1948 Universal Declaration of Human Rights (Article 25) and Article 11 of the International Covenant on Economic, Social and Cultural Rights (1966). The right to a good and healthy environment is also emphasized in Article 28 H of the 1945 Constitution of the Republic of Indonesia. Some of the impacts that the Tambakrejo community has suffered have disrupted their everyday lives, thus the government must take decisive steps to address this complex land subsidence situation. Government promises must be fulfilled so that the consequences they experience are not exacerbated and can be managed.

Political Policy of the Semarang Government in Responding to Land Subsidence in Tambakrejo Semarang

The phenomenon of land subsidence in Tambakrejo, Semarang has devoured dozens of houses, so there is a need for solutions and political action by the Semarang government to solve the problem of the sinking of dozens of residents' houses in Tambakrejo. Residents' homes that have not yet been submerged are also flooded every day by water that enters the house, damaging residents' belongings.

Since 2010 until now, local residents have not felt the effective efforts of the Government of Semarang. After the author interviewed the Head of Neighbourhood, Mr. Edi Setyono, RT 05/RW016, Tambakrejo, Kel.Tanjung Mas, he said that residents had not experienced an effective solution from the Government of Semarang in handling tidal floods around Tambakrejo.

So far, Mr. Edi Setyono stated that the solution that the residents hoped for was the construction of a concrete wall in the form of a village belt and pumps named "Larap Flood Control and Rob in the Tambak Lorok Area "which was

proposed by the Semarang City Task Force Ir. Hj. Hevearita Gunaryanti, M. Sos. Where implementation is expected to begin in early September 2022. Initial identification in the form of measuring residents' assets from the wall of PT Indonesia Power to the east roughly 37 meters to the north seaward 28 fields has been accomplished thus far. Nonetheless, the Government of Semarang has not yet implemented the village belt's construction. In this instance, the administration has expressed legitimate optimism over the ground subsidence situation in Tambakrejo.

Figure 3. Schematic of the Tambakrejo Village Belt Plan

The incident in 2020 was a dark period for the residents of Tambakrejo, because the seawater had devoured 15 houses in the Tambakrejo area, to be precise at RT 05 RW 16. After the residents' houses were lost, the seawater plunged, this incident forced residents to leave their homes, so that in 2020 many residents feel they have lost their lives. this incident because they did not get compensation or compensation for the house they left behind.

While residents whose houses were damaged by the crashing sea waves mostly reported damage and loss of their homes to the local RT and RW to obtain compensation from the Government, only a few of them received compensation in the form of a house renovation program for 9 houses by the Central Government. Seeing from the people's houses that were renovated by the government is not comparable to the number of residents' houses that have suffered losses so that the implementation of the principle of proportionality cannot be seen.

Frequently, tidal flooding occurs during the full moon since the sea tide rises when the full moon shines. With the cooperation of the Department of Geology Engineering at Diponegoro University, the Port, and the Meteorological, Climatological, and Geophysical Agency, which provided a tidal calendar, it was possible to foresee the abrupt tidal flood that destroyed the homes of residents. However, this calendar is only provided by the Meteorological, Climatological, and Geophysical Agency and the port if residents request the tidal calendar in advance. The government is not swift in preventing tidal waters. The government should provide a routine tide calendar without being asked by residents. The Tambakrejo community has the right to get access to information such as the tide calendar provided by the government and to have fulfillment of their rights to a healthy and good environment in accordance with UUPPLH regulations Article 65 paragraphs (2) and (4) (Habibah, 2021).

In spite of the government's efforts to build the East Flood Canal Bandungan in order to reduce the volume of tidal water so that it does not spread to other regions of Semarang, Semarang is still affected in the Tambak-rejo area. The government of Semarang relocated citizens affected by development in the East Flood Canal area to the Tambakrejo settlement. This resulted in the construction of more and more dwellings in

the Tambakrejo area, resulting in a decline in the topographical relief of the land. The deeper excavation of the ground for the construction of relocation housing for residents of the East Flood Canal significantly contributed to the occurrence of land subsidence in Tambak-rejo. In addition, not only has the pressure of the topographic relief dimi-nished, but also a great deal of rubbish has been carried away by the tidal waves and wave currents, polluting the ecosystem of Tambakrejo. In actua-lity, many of the mangrove trees around Tambakrejo that were planted by locals in an effort to restrict the tidal flood have fallen and perished, and are now contaminated with a considerable meas-ure of plastic waste.

The government did not imple-ment the provisions of article 28H paragraph (1) of the 1945 Indonesia Law where the regulation stated that it had granted constitutional rights, namely the right to a good and healthy environment. In addition, it is included in the context of human rights in the form of the right to a good and healthy environment and management of a clean and living envi-ronment where the Tambakrejo people do not get these rights even though these rights apply to all Indonesian people without exception as listed in the Culti-vation and Preservation of the Environ-ment Law (Law No. 32 of 2009) article 65 paragraph 1 and the Human Rights Law (Law No. 39 of 1999) article 9 paragraph 3. Tambakrejo Semarang residents have the right to get justice for the imbalance in rights they get and the government must immediately handle this case before other plains devoured by water and garbage.

Figure 4. Piles of Plastic Waste in Tambakrejo

The government has already completed the leveling of the RT 05/RW 16 road around the Tambakrejo settle-ment, but only for a distance of about 80 meters. Since this distance does not cover the majority of the roads in the Tambakrejo settlement, many access roads are inaccessible due to sea water and plastic waste. The community has difficulty accessing the road on a daily basis, which requires the government's attention and additional efforts so that residents have no difficulty accessing the road. As a result, local residents have asked the government through the neighborhood head to raise the road by 80 meters, which the government has agreed to do. Ironically, Tambakrejo inhabitants must petition the govern-ment to budget funds for road elevation in Tambakrejo, despite the fact that two-wheeled vehicles and walkers have a tough time traversing the Tambakrejo road. This problem is urgent and involves many interests and rights of citizens, as stated in article 3 of Law No. 6 of 1974 containing the Principles of Social Welfare Statutes, which states that the government as a policymaker establishes the policies necessary to maintain, foster, and improve social welfare, raise awareness of community social responsibility, and carry out administrative functions to achieve these objectives.

The authors believe that the Tambakrejo community requires advocacy and communication regarding the issue of land subsidence in order to identify the reasons and implement preventative measures. However, it is regrettable that the government has not advocated for or reached out to the Tambakrejo community, as a result of which the community has no other recourses or options to address the issue of land subsidence other than to attempt to raise the home. Similarly, the people who were relocated from the East Flood Canal to Tambakrejo did not receive socialization and advocacy from the government regarding their relocated residences. As a result, when they occupied the relocation houses in Tambakrejo, they felt disadvantaged because they had not received adequate housing and the area was still affected by land subsidence. In addition, environmental management in Indonesia must have a court that is distinct from other courts so that persons who continue to break the rules for the use of groundwater can be pursued. There is a need for law enforcement reform with a paradigm that maximizes the application of administrative punishment.

CONCLUSION

The land subsidence that occured in Tambakrejo had serious impacts on the Tambakrejo community, including the loss of residents' settlements due to tidal flooding, forced relocation and the absence of compensation or compensation, the use of groundwater resulting in disruption of public health, and the presence of a large number of wild animals, such as snakes, that frequently attack residents. Therefore, the residents often experience skin health problems, the amount of plastic waste that is carried from several areas so that residents' settlements are polluted, and the existence of a mangrove community, namely CAMAR or the Tambakrejo environmental care community which was established to prevent tidal floods. In this instance, the government failed to apply the proportionality principle and did not implement the primary social welfare requirements.

The incident in Tambakrejo needs a policy by the government. Policies that have been carried out by the government include the plan to build a Flood Control Larap and Rob in the Tambaklorok Area which includes Tambakrejo in the form of a village belt, the existence of a house renovation program carried out by the central government on 9 houses of residents who were destroyed, the creation of a tidal calendar by the Meteorological, Climatological, and Geophysical Agency and Diponegoro University, Construction of the East Flood Canal and drainage water pump, and road elevation around Tambakrejo. Thus, the government is expected to be able to realize the policies that have been planned and carry out advocacy and outreach to the people of Tambakrejo.

REFERENCES

Abdullah, Nuriman, & Rahmah, S. (2022). Empowerment of Community Broad-Base Education Center for Arabic-Jawi Study at Deah Nurul Yaqin. *Riwayat: Educational Journal of History and Humanities*, *5*(2), 306–317.

Aji Styawan. “Banjir Rob Jawa Tengah: Pemerintah Segera Bangun Tanggul, Tapi Peneliti Sebut Penurunan Muka Tanah Penyebab Utama Banjir.” BBC Indonesia, (2022).https://www.bbc.com/indonesia/indonesia-61573061.

Archenita, Dwina, Silvianengsih, Desmon Hamid, Monika Natalia, and Merly Misriani. "Kajian Land Subsidence Untuk Perkuatan Tanah (Studi Kasus Sawahlunto)." *Rekayasa Sipil* XII, no. 2 (2015): 5. http:// syawal88.wordpress.com/2013/04 /14/s.

Edi Setyono. "Wawancara Masyarakat Tambakrejo." Tambakrejo Semarang. (2022).

Franz Krause, and Mark Harris. *Delta Life: Exploring Dynamic Environments Where Rivers Meet the Sea.* United Kingdom: Berghahn Books. (2021).

Guzy, Artur, and Agnieszka A Malinowska. "State of the Art and Recent Advancements in the Modelling of Land Subsidence Induced by Groundwater Withdrawal," (2020).

Habibah, Astrid Faidlatul. "Era Masyarakat Informasi Sebagai Dampak Media Baru" 3, no. 2 (2021): 350–63.

Herlambang, Adib Auliawan. "DPU Gunakan Alat Khusus Pantau Penurunan Tanah Di Semarang." ayosemarang, 2021. https://www. ayosemarang.com/semarang-raya/pr-771139722/dpu-gunakan-alat-khusus-pantau-penurunan-tanah-di-semarang.

Hutan, Editor Lindungi. "Kelompok CAMAR Selamatkan Pesisir Semarang Dari Abrasi Tulisan Ini Diambil Dari Sumber: Https:// Lindungihutan.Com/Blog/Kelompok-Camar-Selamatkan-Pesisir-Semarang/ Copyright Lindungi Hutan.Com Dukung Hutan Indonesia Hijau Kembali Dengan Menanam Pohon Mulai," 2022. https://lindungihutan.com/blog/kelompok-camar-selamatkan-pesisir-semarang/.

Ketua RW 16. "Wawancara Ketua RW 16 Tambakrejo." Tambakrejo Semarang, (2022).

Kuswati, Ratih Tri, Yuniyanto, T., & Kurniawan, D. A. (2022). The Existence of Women in Harian Neraca Press 1989-1994. *Riwayat: Educational Journal of History and Humanities*, *5*(2), 253–268. https://doi.org/10.24815/jr.v5i2.26793

Lukas Ley. "Figuring (Out) the Sinking City: Tidal Floods and Urban Subsidence in Semarang, Indonesia." Veröffentlicht von University of Pennsylvania Press., (2021).

Munawar, Zaid, & Sucipto, S. (2022). Sultan Agung's Cultural Insights: Reflections of Javanese Insights. *Riwayat: Educational Journal of History and Humanities*, *5*(2), 341–350. https://doi.org/10.24815/jr.v5i2.27151

Prasetyo, Yudo, and Sawitri Subiyanto. "Studi Penurunan Muka Tanah (Land Subsidence) Menggunakan Metode Permanent Scatterer Interferometric Synthetic Aperture Radar (Ps-Insar) Di Kawasan Kota Cimahi - Jawa Barat." *Teknik* 35, no. 2 (2014): 78–85. https://doi.org/10.14710/teknik.v35i2.7184.

States, United, Elizabeth L Pollard, Patrice D Lee, Laura H. Lippman, Kristin Anderson Moore, Hugh McIntosh, Australian Institute of Health and Welfare; Australian

Research Alliance for Children & Youth, et al. "Undang-Undang Republik Indonesia Nomor 32 Tahun2009." *Journal of Human Development* 6, no. 1 (2009): 1–22. http://www.keepeek.com/Digital-Asset-Management/oecd/development/the-world-economy_9789264022621-en#.WQjA_1Xyu70%23page3%0Ahttp://www.sciencemag.org/cgi/doi/10.1126/science.1191273%0Ahttps://greatergood.berkeley.edu/images/application_uploads/Diener-Subje.

Suhelmi, and Hari Prihatno. "Model Spasial Dinamik Genangan Akibat Kenaikan Muka Air Laut Di Pesisir Semarang."*Jurnal Manusia Dan Lingkungan* 21, no. 01 (2014): 15–20.

Peraturan Pemerintah Nomor 82 Tahun 2001 tentang Pengelolaan Kualitas Air dan Pengendalian Pencemaran Air

Undang-Undang Dasar Negara Republik Indonesia Tahun 1945.

Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang.

Undang-Unang Nomor 4 Tahun 1982 tentang Ketentuan - Ketentuan Pokok Pengelolaan Lingkungan Hidup.

Undang-Undang Nomor 6 Tahun 1974 tentang Ketentuan - Ketentuan Pokok Kesejahteraan Sosial.

Undang-Undang Nomor 32 Tahun 2009 tentang Perlindungan dan Pengelolaan Lingkungan Hidup.

Undang-Undang Nomor 39 Tahun 1999 tentang Hak Asasi Manusia.