

The Environmental Impact Analysis of the Scrap Iron Cutting Industry in Kamal-Bangkalan Regency: A Sharia Economic Law Perspective

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Abstract:

The sunken or damaged ships cutting scrap metal business in Tanjung Jati Kamal Village, Bangkalan, Madura, has sparked controversy among local residents. Ship dismantling is performed by using heavy machinery which generates dense smoke that affects the ecosystem and poses health risks to the local community. This research aims to assess the severity of the negative consequences of environmental pollution and to investigate the extent to which existing regulations govern the pollution generated. To enhance the study, it examines the principles of sharia economics to determine if these economic activities align with sound economic principles. Utilizing empirical legal research methods, this study relies on primary data obtained directly from the research site through interviews with local residents, workers, and teachers in the vicinity of the industry. Additionally, secondary data is gathered from credible news sources, books, and scientific journals concerning scrap metal cutting activities. The findings indicate that scrap metal cutting contributes to environmental pollution and adversely affects public health, particularly the children. While relevant regulations exist, there is a need for enforcement and more specific law to regulate the standard operating procedures for scrap metal cutters. Moreover, the practice does not align well with the principles of sharia economic law.

Keywords:

Environmental Impact Analysis, Scrap Iron Cutting Industry, Sharia Economic Law



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Introduction

The shipwrecks or unusable vessel scrap metal cutting has polluted the surrounding environment of the scrap metal cutting industry in Tanjung Jati Kamal, Bangkalan, Madura. Environmental impacts from scrap metal cutting cover air, water, and soil pollution. During the recycling process, emissions and residues contribute to air pollution. Scrap metal improper disposal and processings contaminate water bodies and threatening aquatic life as the same time. Metal washing from scrap leads to soil pollution which affects ecosystems and agricultural land. Thus, the scrap metal cutting industry in Kamal Bangkalan has the potential to pollute the surrounding environment while the community needs green open spaces for fresh air.¹

Studies on the impacts of scrap metal cutting generally focus on two aspects: the buying and selling practices of scrap metal and the environmental pollution resulting from scrap metal cutting activities. Aftina explains that based on her observational data, activities conducted by scrap metal traders involve sourcing and purchasing raw materials, selling them to scrap collectors, sorting scrap at business sites, and selling products from smelting operations. In-depth interviews with small, medium, and large scrap traders, collectors, owners, spouses, children, and relatives of scrap businesses shed light on how the Madurese scrap metal traders from Bangkalan follow in the footsteps of relatives who previously ventured into the trade.² Regarding environmental pollution caused by scrap metal cutting, Dinda Pratiwi's article indicates that such activities lead to air pollution due to dense smoke, as well as water pollution from waste which disposed directly into the sea without proper processing facilities.³

¹ Rinda Andhita Regia and Katharina Oginawati, "POTENSI BAHAYA DEBU SILIKA TERHADAP KESEHATAN PANDAI BESI DESA MEKARMAJU KABUPATEN BANDUNG," *Jurnal Dampak*, 2017, 75, <https://doi.org/10.25077/dampak.14.2.73-80.2017>.

² Aftina Fityan Sholeh, "Adaptasi Pedagang Besi Tua Suku Bangsa Madura Di Kota Surabaya," *Biokultur*, 2020, 69-75.

³ Dinda Pratiwi Pratiwi and Dian Ayu Larasati, "ANALISIS DAMPAK PENGOLAHAN BESI TUA TERHADAP LINGKUNGAN DI DESA TANJUNG JATI MADURA," *Swara Bhumi* 1, no. 1 (2022).

This paper aims to address gaps in previous research that overlooked the regulation of the scrap metal cutting industry based on existing laws and how the sharia economic law perspective evaluates this long-established business activity in Tanjung Jati Kamal, Bangkalan. Specifically, this paper seeks to answer how the scrap metal cutting industry is regulated in Kamal Bangkalan and how sharia economic law views these business activities.

This research argues that the scrap metal cutting industry from shipwrecks or unusable vessels in Tanjung Jati Kamal Bangkalan violates national and local regulations. Furthermore, this business activity deviates from the principles of sharia economic law, which are based on principles of monotheism, justice, public benefit, stewardship, enjoining good and forbidding wrong, purification, prosperity, honesty, benevolence, accountability, sufficiency, and balance.⁴ Therefore, a thorough examination of the scrap metal cutting industry in Tanjung Jati Kamal Bangkalan is necessary to determine whether these business practices comply with existing regulations or are contrary to them.

Method

This study is classified of empirical legal research, relying on primary data ⁵ collected directly from the research site through observation and interviews with relevant stakeholders. Primary data was gathered through interviews with a physical education teacher at Tanjung Jati 1 Elementary School. To support the primary data collected on-site, secondary data was also obtained from various online news sources such as Radar Madura, Tempo, Liputan6, and other environmental pollution caused by the scrap metal cutting industry along the coast of Tanjung Jati Kamal Bangkalan Madura. Other secondary data come from legislation, ranging from laws, East Java Province and Bangkalan Regency regional regulations, as well as books and scientific journals relevant to this research. The collected data was then analyzed descriptively and analytically, while the conclusions were drawn inductively.

⁴ Kholid Muhammad, "Prinsip-Prinsip Hukum Ekonomi Syariah Dalam Undang-Undang Tentang Perbankan Syariah," *Asy-Syariah*, 2018, 148-49.

⁵ Soerjono Soekanto, *Pengantar Metode Penelitian Hukum* (Jakarta: FH UI Press, 1982).

Result and Discussion

Environmental Impact of the Old Iron Cutting Industry in Kamal, Bangkalan, Madura

In Indonesia, there are three shipbreaking yards, one of which is located in Tanjung Jati Village, Kamal, Bangkalan, Madura. Tanjung Jati Village is located near the coast and Kamal Port. In this village, old iron processing and specifically ship dismantling activities are conducted by using heavy machinery that emits thick smoke. The dismantled old iron is then transported by truck, leading to air pollution in the residential areas of Tanjung Jati Village. In addition to air pollution, water pollution also occurs because the old iron processing activities produce waste which is directly dumped into the sea, resulting in unclear and unclean waters. The waste is disposed directly into the sea as there are no waste processing facilities for the old iron cutting activities.

The old iron cutting activities in the coastal area of Kamal cause environmental contamination for several reasons: the ship dismantling activities pollute the environment due to the waste produced, both solid and liquid, which eventually disrupt water and soil quality.⁶ This waste may contain heavy metals and hazardous chemicals that negatively affect the ecosystem and public health. Additionally, the ship cutting process requires the use of chemicals and heavy metals that can further contaminate the environment. These chemicals can disrupt the balance of the ecosystem and have the potential to cause environmental damage. Therefore, ship cutting activities can lead to environmental degradation, such as soil degradation, deforestation, and decreased water quality. This damage negatively impact public health and the ecosystem. The waste produced from ship cutting activities contaminate water, adversely affects water quality and public health. For instance, waste containing heavy metals can cause people and fish poisoning for consuming that water.

Referring to several news sources, the local population experiences many negative impacts from the old iron cutting activities in the coastal area of Tanjung Jati, Kamal, Bangkalan, and the community hopes the government to review the business permits of

⁶ Galuh Garmabrata, "Sigi: Petaka Bisnis Kapal Rongsokan," *Liputan6.com*, 2018.

those involved in the old iron cutting industry in Kamal, Bangkalan. In summary, news related to environmental pollution in Tanjung Jati Village, Kamal, Bangkalan, due to old iron cutting activities depicted in the following table:

Table 1: Environmental Pollution Data from Online News

| No. | News Title | Source |
|-----|---|---|
| 1 | Ship Cutting Industry in Bangkalan Pollutes the Sea | https://nasional.tempo.co/read/639651/industri-pemotongan-kapal-bangkalan-cemari-laut |
| 2 | Environmental Agency Determines Ship Cutting Permits | https://www.koranmadura.com/2014/03/blh-menentukan-izin-pemotongan-kapal |
| 3 | Sigi: The Disaster of the Scrap Ship Business | https://www.liputan6.com/news/read/3240910/sigi-petaka-bisnis-kapal-rongsokan |
| 4 | Council Urges Action Against Illegal Ship Cutting Activities; DPMPTSP and Satpol PP in Blame Game | https://radarmadura.jawapos.com/hukum-kriminal/744753569/dewan-minta-tindak-aktivitas-pemotongan-kapal-ilegal-dpmptsp-satpol-pp-bangkalan-saling-lempar-tanggung-jawab |
| 5 | Ship Cutting Environment in Kamal: Sea Water and Air Contaminated with Iron Dust | https://matamaduranews.com/lingkungan-pemotongan-kapal-di-kamal-air-laut-dan-udara-tercemari-serbuk-besi |

Source: Listed based on the author's research from various sources.

Based on the data presented in Table 1 above, it can be seen that the impact of the old iron cutting industry activities in the coastal area of Tanjung Jati Village, Kamal, Bangkalan, is very detrimental to the surrounding population. The impact of air pollution is also felt by school children who are not far from the old iron cutting industrial area.

This research is also supported by primary data from interviews conducted with representatives at Tanjung Jati 1 Public Elementary School. The interviews focused on air pollution affecting children's rights at school, arising from the old iron cutting activities. An interview was conducted with Mr. Farid Alfarizi, a physical education

teacher, who has been teaching for approximately two years at Tanjung Jati 1 Public Elementary School. He stated;⁷

“The impact is highly felt by the students during physical education classes particularly when the students are in the schoolyard during sports lessons. In the morning when the cutting is taking place, the smoke is very thick, so as a precaution, I move the children to another place.”

He also explained the issue of breathing difficulties experienced by his students as follows;⁸

“For the past two years, the children have not reported any breathing difficulties, even in indoor spaces like classrooms; the smoke from the old iron cutting can still be felt. However, there have been alumni who experienced breathing difficulties due to the smoke. Even though there are walls or fences separating the old iron cutting site from Tanjung Jati 1 Public Elementary School, the air pollution can still be felt by the children because it is blown by the wind.”

Regarding the school students’ rights, interview with the teachers reveals;⁹

“For their rights, they are still not fulfilled. They said that if the iron cutting here causes very thick smoke, there should be a relocation or something similar. However, until now, the school remains here without any land relocation or facilities provided by the old iron cutting parties over the past two years.”

⁷ Farid Alfarizi, “Wawancara Langsung (Guru Pendidikan Jasmani Olahraga)” (2023).

⁸ Alfarizi.

⁹ Alfarizi.

Thus, the only solution from the school is to close doors and windows when the smoke becomes thick which makes the children annoyed during lessons.

Meanwhile, residents and workers claim that their health is not affected. Some of the chemical compositions found in iron, one of which is silica (Si), can be hazardous to the health of the surrounding community, especially school children. This can lead to reduced lung function, acute pneumonia, autoimmune disorders, and even lung cancer. Crystalline silica that settles in the lungs oxidizes the alveolar walls, leading to fibrosis. The more crystalline silica accumulates in the lungs, the worse the fibrosis in the alveoli becomes. This situation triggers a disease known as silicosis pneumoconiosis. The processing of old iron generates crystalline silica dust, which is not classified as an odor-producing substance that is prohibited and harmful to human health. Silica-containing dust ranks as the second highest chemical component in dust after Fe and is classified as Group 1, meaning it is carcinogenic to humans. Therefore, there is a potential risk of developing lung diseases due to frequent exposure to crystalline silica through inhalation.¹⁰

Another important issue is the negative impact caused by these activities. The sea is becoming increasingly polluted, and the ecosystem of marine biota is endangered. The level of pollution is currently being studied by the Bangkalan Environmental Agency in collaboration with the Sepuluh Nopember Institute of Technology in Surabaya. According to sudden inspections of the industrial center, the pollution has not yet negatively affected the health of workers in the ship cutting industry or local villagers.

According to the National Institute of Environmental Health Services, the emission size of dust containing silica varies from diameters of 0.01 micrometers up to 100 μm , while particulate matter $\leq 10 \mu\text{m}$ (PM10) is estimated to be the threshold size for particles that can penetrate the body's natural defenses (mucous membranes, cilia, etc.) and reach deep into the lungs, potentially causing serious health problems. Students in this school environment should have green open spaces, meaning they should be in a comfortable environment, free from threats to their health and safety, thereby supporting the

¹⁰ Regia and Oginawati, "POTENSI BAHAYA DEBU SILIKA TERHADAP KESEHATAN PANDAI BESI DESA MEKARMAJU KABUPATEN BANDUNG," 74.

learning process for children. Heavy metals and hazardous chemicals can negatively impact ecosystems and public health. Furthermore, air pollution from old iron cutting activities can have several negative impacts on the rights of school children in the vicinity. Some examples of potential impacts are:

1. **Respiratory Issues:** Air pollution can lead to respiratory problems, affecting children's health. This condition can result in respiratory issues, such as bronchitis and asthma, which can affect children's daily activities.
2. **Impact on General Health:** Air pollution can lead to various health issues, such as skin cancer, eye problems, and ozone depletion, which can affect children's overall health.
3. **Impact on Quality of Life:** Air pollution can disrupt the quality of children life, especially if they live near old iron cutting activities. This can affect daily activities, such as playing outdoors, and may also impact children's mood.
4. **Impact on Learning:** Air pollution can affect the learning quality of children, particularly if they experience respiratory issues or other health problems. This can impact children's academic performance and also affect the learning atmosphere in the classroom.
5. **Impact on Children's Rights:** Air pollution can affect children's rights at school, such as the right to learn effectively, play safely, and have a conducive learning environment. This can impact children's quality of life and may also affect their future.

Impact of Air Pollution from Old Iron Cutting: A Legal Perspective on Sharia Economics

Coastal area management, based on Article 1 of the East Java Provincial Regulation No. 1 of 2018 regarding the Coastal and Small Islands Zoning Plan for East Java Province 2018-2038, explains that coastal and small island management, hereinafter referred to as PWP-3-k, is a planning process for the utilization, monitoring, and control of coastal resources and small islands across sectors. This management involves the Government and Local Governments, as well as the collaboration of terrestrial and marine ecosystems, and

science and management to improve community welfare.¹¹ Coastal and small island management represents the government's special attention to coastal spaces, seas, and small islands. Natural resources, strategic areas, and conservation spaces are under regions government and relevant party management.

The management of the area is carried out to improve social welfare within a certain environmental region or area over a specified period (Article 1, paragraph 12). Coastal area management is regulated by national legislation of each provincial region. Generally, coastal area management is governed by Law No. 1 of 2014 on Coastal and Small Island Management; this law is broad in scope, while technical implementation and detailed regulations are specified in the regional regulations of each province. The coastal management regulations for East Java Province are outlined in Regional Regulation No. 1 of 2018. This regulation is detailed in the provincial bylaw since the marine area is under the responsibility of the provincial government up to 12 nautical miles from the coastline (Article 2, paragraph 2). The Coastal and Small Islands Zoning Plan, hereinafter referred to as RZWP-3-K, is a plan that determines the direction for resource utilization for each planning unit, along with the establishment of spatial structures and patterns in the planning area that specify permissible and prohibited activities, as well as activities that can only be conducted after obtaining permits in coastal and small island areas (Article 1, paragraph 13). Each area is regulated based on its potential and future development directions.

Coastal Zoning Plan for Kamal Waters

The zoning plan for a coastal area is determined based on various considerations. Potential, geographic conditions, and other supporting factors are fundamental considerations in this determination. The aim of this zoning plan is to maximize the development of an area through careful planning, which also takes into account the local customs of the surrounding community. The area of this scientific research is Tanjung Jati Village in Kamal District. The astronomical location of the ship scrapping activities in Tanjung

¹¹ Provinsi Jawa Timur, "Peraturan Daerah (Perda) Provinsi Jawa Timur Nomor 1 Tahun 2018 Tentang Rencana Zonasi Wilayah Pesisir Dan Pupau-Pulau Kecil Provinsi Jawa Timur Tahun 2018-2038," Pub. L. No. 18 (2018).

Jati Village is at 7°10'15.21" South Latitude and 112°44'07.60" East Longitude.

This location is not specifically identified in the East Java Coastal Zoning Plan (RZWP) document. The identification of the zone refers to the nearest coordinates from the research location already listed in the RZWP document. From the East Java Coastal Zoning Plan (RZWP) document, the surrounding identified zone is defined in accordance with the zoning matrix outlined in the RZWP. The astronomical location of this zoning is at 7°10'27.80" South Latitude and 112°44'36.1" East Longitude. The zoning defined in the RZWP, as shown in figure 4.13, includes Pelagic and Demersal zones. Pelagic fish live near the surface of the sea, tend to school, and migrate, while demersal fish live on the seabed and typically do not move around.¹²

The establishment of this zone aims to maximize fishing activities in the surrounding waters. Dangerous and contrary activities to the zoning objectives are prohibited. Discrepancies between zoning and ongoing activities are the government's responsibility to evaluate. Zoning plans should adjust to the conditions on the ground. The ship scrapping activities have been ongoing for nearly 30 years. If there is no specific zoning allocation for this location, the government has an obligation to prohibit such activities.

From a social perspective, this activity requires further government examination to determine appropriate actions regarding ship scrapping. Actions may include continued communication to regulate or entirely prohibit the activity. According to Regional Regulation No. 10 of 2009 on the Spatial Planning of Bangkalan Regency, Article 103, point (d), industrial zones must be at least 2 kilometers away from residential areas and 15-20 kilometers from the city center, while the distance of the iron cutting in Kamal is only about 5 meters from residential areas.¹³

¹² Timur.

¹³ Kabupaten Bangkalan, "Peraturan Daerah Kabupaten Bangkalan Nomor 10 Tahun 2009 Tentang Tata Ruang Wilayah Kabupaten Bangkalan Tahun 2009-2029," Pub. L. No. 10 (2009).

Legal Efforts Regarding Salvage (Ship Scrap Cutting)

Every business and/or activity that requires an Environmental Impact Assessment (Amdal) and an Environmental Management Plan (UKL-UPL) must have an Environmental Permit (Article 36, paragraph (1) of Law No. 32 of 2009 on Environmental Protection and Management). Anyone who violates this can face criminal penalties as stipulated in Article 109, paragraph (1) of Law No. 32 of 2009, which states: "Anyone who conducts business and/or activities without an environmental permit as referred to in Article 36, paragraph (1) shall be punished with imprisonment for a minimum of 1 (one) year and a maximum of 3 (three) years."¹⁴

Legal efforts toward old scrap metal cutting activities which cause environmental pollution in Kamal coastal areas involve several steps:

1. **Supervision:** The government must conduct stricter supervision of ship cutting activities in Kamal to reduce negative environmental impacts. This includes ensuring the industry complies with environmental standards and does not pollute the waters and sediments around the Kamal area.
2. **Development of Environmentally Friendly Shipyards:** The development of environmentally friendly ship recycling yards in Indonesia, such as in Kamal, Madura, can be a better and more sustainable alternative. Technical analysis for ship recycling in Kamal recommends the usage of a slipway method for docking and dry ice blasting to minimize waste.
3. **Waste Management:** Ship cutting industries must ensure effective and sustainable waste management. This includes reducing the amount of waste generated and managing the waste produced more effectively.
4. **Coordination with the Government:** Ship cutting industries should coordinate with local governments to ensure that their activities do not pollute the environment and potentially harm surrounding communities.

Thus, the legal efforts related to old scrap metal cutting in the Kamal coastal area that leads to environmental pollution involve

¹⁴ Republik Indonesia, "Undang-Undang (UU) Nomor 32 Tahun 2009 Tentang Perlindungan Dan Pengelolaan Lingkungan Hidup," Pub. L. No. 32 (2009).

more comprehensive and sustainable measures to mitigate negative environmental impacts.

Human as Khalifah in Islamic Economic Law Principles

Islamic economic law principles require all humanity manage the Earth and its resources as best as possible for the benefit of themselves and others. However, the previllage in managing the Earth must have certain limitations to prevent humans from falling into greed, which can ultimately damage the Earth and its resources.¹⁵ The sunken or unserviceable ship scrap metal cutting activities which pollute the environment (air, soil, and water) and impact the lives of other people reflect poor management of the Earth. This stands in opposition to other principles of Islamic economic law, as explained below:

First: Principle of Al-Maslahah, the public interest is the Islamic law goal which aims to achieve happiness in this world and the hereafter by seeking benefits and avoiding harm. One of the characteristics of public interest is dharuriyyat. This is the must-exist conditions to uphold good in this world and the hereafter; if it's absent, goodness will vanish. These aspects are encompassed in maqasid al-syari'ah, which include preserving religion, life, lineage, wealth, and intellect. Seeking livelihood is included in dharuriyyat as it aims to preserve lineage and wealth. The ship cutting activities in Kamal District can be categorized as dharuriyyat in economic development; however, the potential harm from air pollution to the younger generation in Kamal in the future is very high.¹⁶

Second: Principle of Tauhid. Islam bases economic activities as an endeavor to worship Allah SWT. Hence, the purpose of these endeavors is not merely to seek profit or material satisfaction for personal interests but to seek the pleasure of Allah SWT, as well as spiritual and social fulfillment. The tauhid principle implementation in the scrap iron cutting activities in Kamal is not yet evident. The

¹⁵ Bhismodi Tri Wahyu Faizal, "Hukum Bisnis Perspektif Islam Dan Kapitalis (Tinjauan Teoritis Atas Aktivitas Bisnis Di Indonesia)," *Al-Huquq: Journal of Indonesian Islamic Economic Law* 3, no. 2 (December 16, 2021): 143–62, <https://doi.org/10.19105/alhuquq.v3i2.5218>.

¹⁶ Mohammad Haikal and Sumardi Efendi, "Prinsip-Prinsip Hukum Ekonomi Syariah Dalam Undang-Undang Perbankan Syariah," *MAQASIDI: Jurnal Syariah Dan Hukum*, no. 13 (2024): 26–39, <https://doi.org/10.47498/maqasidi.v4i1.2988>.

activities tend to focus to the economic aspect without considering the process and waste disposal.

Third: Principle of Justice. The justice principle application in the scrap iron cutting activities in Kamal is also not well depicted throughout the process, as it does not provide enough time for the community to breathe fresh air. There are no clear methods or Standard Operating Procedures (SOPs) in place to reduce the pollution caused by these activities. The justice principle should be clearly articulated in the SOP as an instrument to grant rights to the community and the environment, allowing both to benefit from the scrap iron cutting activities.

Fourth: Principle of Amar Ma'ruf Nahy Munkar. This principle aims to encourage people to do good and prevent wrongdoing in every economic activity undertaken. It is closely related to the tolerance value which aligns with Islamic beliefs. As Allah SWT states in Surah Al-Imran, verse 104: "Let there be among you a group that invites to goodness and enjoins what is right and forbids what is wrong." In the scrap iron cutting context, continuous supervision and evaluation are necessary to ensure that the activities do not effect the community and the surrounding environment negatively.

Conclusion

The activity of cutting scrap iron in the coastal area of Kamal causes environmental pollution for several reasons. The ship cutting activities in this area can contaminate the environment due to the waste produced, both solid and liquid, which can disrupt the quality of water and soil. This waste may contain heavy metals and hazardous chemicals which can negatively impact ecosystems and public health. Therefore, there is a need for serious enforcement of Regional Regulation No. 1 of 2018, Article 1, which explains the management of coastal areas and small islands in the processes of planning, utilization, supervision, and control of coastal and small island resources across sectors.

One of the chemical compositions found in iron is silica (Si), which is present in crystalline form. The dust generated during the iron cutting process contains silica, which can be harmful to the health of nearby communities, especially school children, as it can be inhaled and lead to decreased lung function, acute pneumonia, autoimmune disorders, and even serious diseases such as lung cancer. Thus, there

is a need for regulations that specifically address waste and the impacts of the iron cutting process. Moreover, the iron cutting activities do not reflect the Islamic economic principle application, such as the Principle of Kemaslahatan, the Principle of Tauhid, the Principle of Justice, and the Principle of Amar Ma'ruf Nahy Munkar.

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