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Research Paper

Efforts to Overcome Environmental Damage Due to the Mining of the Octopus 1 Tin Suction Vessel in Matras Waters, Bangka Islands

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Abstract

Tin mining activities in Matras Waters, Bangka Islands, mostly use Kapal Isap Timah (KIP). Tin mining using KIP hurts the marine environment, ecosystems, and coastal areas. This study aims to determine efforts to overcome environmental damage from mining the KIP. Octopus 1 in Matras Waters, Bangka Islands. This research method uses a qualitative approach. Data sources in this study were obtained from primary and secondary data by conducting interviews, observation, documentation, and literature study. The data analysis technique used in this study is the method of Miles and Huberman. There are three stages to conducting data analysis: data collection, data reduction, data presentation, and conclusion. The results of this study are to show the efforts made by PT. Orion Transportasi Internasional in overcoming environmental damage, namely by improving the shape of the tailing chute that is not by the regulations and cooperating with PT. Pelayaran Lomasasta is related to the document of Persetujuan Kesesuaian Kegiatan Pemanfaatan Ruang Laut (PKKPRL).

Keywords *KIP. Octopus 1, tin mining, environmental damage*

INTRODUCTION

The territory of the Bangka Belitung Archipelago Province includes two islands, Bangka Island and Belitung Island, and several small islands in the vicinity. The provincial capital of the Bangka Belitung Islands is Pangkal Pinang (Peta Wilayah, BPK Perwakilan Provinsi BANGKA BELITUNG, 2022) The Bangka Belitung Archipelago Province is known for having enormous natural resource potential in the form of sand/tin ore. Tin is a silvery-white, low-hard metal. The specific gravity of tin is 7.3 g/cm3, while sand only has a specific gravity of 2.57 g/cm3 (Susiati, 2022).

Two types of tin mining processes are usually carried out by residents of the Bangka Belitung Islands: land mining and sea mining. Mining at sea is carried out by sucking tin ore using a ladder/swing boom until it is dumped into the tailing chute, usually, this is done using dredgers, suction boats, or simple floating illegal mining or Tambang Illegal (TI), which are usually used by the local community at a lower cost. The process of tin mining in the Bangka Belitung Archipelago Province often raises pros and cons in the community due to the impacts arising from mining, namely damage to the environment around the waters and the coast, thereby destroying the natural resources of marine biota, which have an impact on people who work as fishermen. Environmental damage is a process of decreasing the quality of the environment, called deterioration (Dinas Lingkungan Hidup, 2017).

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Various regional government regulations have been issued, starting from limiting the number of miners or tin suction vessels that can operate in an area based on the IUP (Izin Usaha Pertambangan) that has been issued so that tin mining does not accumulate in a particular area. The imposition of a mining ban in several coastal areas is also enforced so that not all coastal areas are used for tin mining and can be allocated for tourism objects and the preservation of marine natural resources. PT. Orion Transportasi Internasional is a company engaged in the tin mining business. PT. Orion Transportasi Internasional conducted a KSO (Kerja Sama Operasional) with PT. Pelayaran Lomasasta has been around for a long time and has a tin smelter in Pangkal Pinang City. In the tin mining business at sea, using a tin suction vessel owned by PT. Pelayaran Lomasasta, PT. Orion Transportasi Internasional repaired several ships belonging to PT. Pelayaran Lomasasta has not been used for a long time using floating repair in the estuary area around PT. Pelayaran Lomasasta so that PT Orion Transportasi Internasional can operate it.

During the operation of the tin suction vessel PT. Orion Transportasi Internasional once received a warning for a temporary suspension of mining operations by the KKP (Kementerian Kelautan dan Perikanan). KKP asked KIP. Octopus 1 to temporarily stop tin sand mining due to alleged violations of environmental damage to fish resources and coastal waters due to violations related to tailings disposal that did not pay attention to standards for preventing pollution and coastal damage. "Tailing is a type of waste produced by mining activities, and its presence in the world of mining cannot be avoided." (Mangara et al., 2007). KKP found indications that violations in the implementation of tailings disposal could potentially cause environmental damage. Based on the background above, the researchers determined that the objectives of this study were:

1. To find out the efforts of PT. Orion Transportasi Internasional in overcoming environmental damage caused by mining the Octopus 1 tin suction boat in Matras Waters, Bangka Islands.
2. To find out the obstacles faced by PT. Orion Transportasi Internasional in overcoming environmental damage.
3. To find out the efforts to overcome the obstacles faced by PT. Orion Transportasi Internasional.

LITERATURE REVIEW

The theoretical description of this study is as follows:

Environmental damage

Based on Undang-undang RI tentang Perlindungan dan Pengelolaan Lingkungan Hidup No: 32 Tahun 2009, "environmental damage is a direct and/or indirect change to the physical, chemical or biological properties of the environment that exceeds the standard criteria for environmental damage".

Mining

Based on the Kamus Besar Bahasa Indonesia (KBBI) (2022), Mining is a process or method of digging, Mining or taking agricultural products in the form of metal ore, coal, minerals, and so on, which are on the surface and in the ground which are carried out in open places that are directly related to the outside world. According to the opinion put forward by Sukandarrumidi, the mining business is an effort carried out by a person or group to take all kinds of minerals and minerals to use the results that have economic value for the interests and needs of humanity. (Sukandarrumidi, 2018).

Production Suction Vessel

Kapal Isap Timah (KIP) is a tool that works to excavate or move tin mixed with soil, gravel, and clay in the subsoil. Using mechanical systems and equipment and their operations rely on a pontoon made of steel and shaped like a banana. (M. Huda, 2018).

Bangka Islands

There are two islands in the Bangka Belitung Archipelago Province, namely Bangka Island and Belitung Island, and several small islands in the vicinity. The provincial capital of the Bangka Belitung Islands is Pangkal Pinang. (Peta Wilayah, BPK Perwakilan Provinsi BANGKA BELITUNG, 2022).

METHODOLOGY

Based on observations of the characteristics of qualitative research from researchers in their discussion, researchers try to explain the results of all studies and research on many things that have been obtained and researched, both in the form of theoretical and practical questions. This research is not only sourced from literature books but also from research contained in shipping company management books and the results of researchers' observations during research. With this research, it is hoped that readers will know some of the efforts that can be implemented to overcome environmental damage caused by tin suction boat mining or tin suction boats operating around the waters of Bangka Island so that readers can also protect the environment so that no damage occurs in the coastal environment and beach. Time and place for conducting research:

Research Place

The researcher conducted this thesis research at PT. Orion Transportasi Internasional which is located on Jl. Abdullah H. Seman 2 No. 169 Kel. Gabek 1, Kec. Gabek, City of Pangkal Pinang, Bangka Belitung, 33118.

Research Time

The researcher researched the land practice of Praktik Darat (Prada) at PT. Orion Transportasi Internasional, which is a subsidiary of PT. Sinarmas LDA Maritime, which starts from 20 August 2021 to 29 July 2022.

In this study, the researcher used the non-probability sampling method as the sample because, according to the researcher, non-probability sampling could provide information according to the needs of this study. Therefore, in this study, the researcher also used purposive sampling as a sampling technique to obtain data according to what is needed in the study of this research. According to Amos (2016), purposive sampling is a sampling technique with special considerations so that it can be used as a sample. Purposive sampling has two main types: sampling based on specific considerations or judgment sampling and quota sampling. However, in this study, the researcher used judgment sampling, which the researcher will use as the basis for sampling. Judgment sampling involves a wide selection of research subjects with the best potential to provide information. Based on this technique, researchers who became informants have determined the technical Superintendent, the Port Engineer under the Technical Department, and the Port Captain under the Operations Department at PT. Orion Transportasi Internasional. This research was carried out using data collection techniques; the techniques in this study were:

Primary Data

a. Interview
   In this study, researchers conducted interviews with several parties, including:
   1) Technical Superintendent of PT. Orion Transportasi Internasional.
   2) Port Engineer PT. Orion Transportasi Internasional.
   3) Port Captain PT. Orion Transportasi Internasional.
b. Observation
   In this study, the researcher conducted participant observation which involved the researcher in the observed activity. In this Observation, researchers are involved in daily activities at PT. Orion Transportasi Internasional from August 20, 2021, to July 29, 2022, during land practice.
c. Documentation
   The researcher used several photos related to the implementation of mechanisms regarding efforts to overcome environmental damage caused by mining the Octopus 1 tin suction boat in Matras Waters, Bangka Islands.

Secondary Data

According to Wardiyanta in Sugiarto, "Secondary data is data obtained indirectly by data collectors from the source, but from third parties." (Eko Sugiarto, 2017). In writing this thesis, secondary data was obtained from literature studies, namely research conducted through reading and studying writings from mass media such as the internet or news from one of the TV channels, books, academic articles, and notes while undergoing land practice at PT. Orion Transportasi Internasional, notes during lectures at the Semarang Shipping Polytechnic, and other data sources related to the topic to gain theoretical and practical understanding, which will be combined with data obtained in the field.

Sugiyono states, "Data analysis is the process of searching and systematically compiling data obtained from interviews, field notes, and documentation.". (Sugiyono, 2019). The researcher chose an analytical technique for this study, namely a qualitative analysis technique, which aims to describe the phenomena being studied systematically, facts, and more accurately. Data analysis in this study was carried out during data collection until it was completed within a certain period. At the time of data collection, the researcher had analyzed the answers given by the informant to the researcher during the interview, if they were not satisfactory, the researcher would continue with several more questions up to a particular stage until data that was considered credible was obtained. The data analysis process in this study starts from studying and understanding the data obtained using the method from Miles and Huberman. To account for the validity of the data used, the researchers in this study also tested the validity of the data using a credibility test, external validity test, reliability test, and objectivity test.

FINDINGS AND DISCUSSION

In this part of the findings, the researcher will explain the causes of the imposition of sanctions by the Ministry of Maritime Affairs and Fisheries for the temporary suspension of tin ore mining operations at sea in Matras Waters, Bangka Islands, to PT. Orion Transportasi Internasional. Based on *Siaran Pers Kementerian Kelautan dan Perikanan, Nomor: SP.126/SJ.5/II/2022* uploaded in kkp.go.id, KIP. Octopus 1 experienced a temporary suspension due to an alleged violation because no document of *Persetujuan Kesesuaian Kegiatan Pemanfaatan Ruang Laut* (PKKPRL) was found on board the ship. In addition, the placement of the tailings disposal channel does not comply with the regulations, which can potentially cause environmental pollution and coastal damage. In the discussion section, the researcher will explain:

1. Efforts to overcome environmental damage caused by mining the Octopus 1 tin suction vessel in Matras Waters, Bangka Islands.

   Regarding the efforts made by PT. Orion Transportasi International In overcoming environmental damage caused by waste disposal sites or tailings that are not by standards, International Transportation Orion is to improve the shape of the tailings chute during the tailing chute repairs at Muara Pangkal Balam, researchers, the Technical Superintendent, and Port Captain made direct observations on board to review the extent of the repair work. The researcher makes a work report with the Technical Superintendent to later report to the Technical Director as accountability for the work plans that have been made. In addition, the researcher also makes a summary and notes needed with the Technical Superintendent as data in this study. PT. Orion Transportasi International has defined procedures and work plans that the researcher, the Technical Superintendent, and the Port Captain have made. PT. Orion Transportasi International also conducts socialization accompanied by the head office and translators to operators and crew from Thailand and Indonesia to find solutions so that when operating ships and tin mining is carried out by government regulations so as not to cause pollution and damage to coastal areas and still prioritize the safety of the ship crew and find a way out about the solution of doing tin mining that is good and right but still produces a lot of tin ore. PT. Orion Transportasi Internasional also coordinated with PT. Pelayaran Lomasasta to arrange the *Persetujuan Kesesuaian Kegiatan Pemanfaatan Ruang Laut* (PKKPRL). This is also

related to the feasibility of the ship in operation and as a form of compliance with existing regulations.

Figure 1. Socialization Process with the Ship's Crew
Source: Personal Documentation (2022)

2. Obstacles faced by PT. Orion Transportasi Internasional in overcoming environmental damage.

   The Technical Superintendent, together with the researchers, made observations and reports on the work carried out; there were several obstacles that PT Orion Transportasi Internasional, are as follows:

   a. Delays in the supply of goods and spare parts used for repairs due to the long indenting and delivery process.

      Goods or spare parts used in *Kapal Isap Timah* (KIP) are rare, difficult to find, and expensive. Spare parts used in tin suction vessels for mining are modified items that are not often found on the market, so some items must be indented beforehand; apart from the long process of indenting goods and shipping, there is much consideration and price negotiation from procurement and finance to several vendors who offer goods which are indeed considered based on price, estimated arrival of goods and the number of goods available so that this has an impact on the estimated time in carrying out repairs due to the length of the procurement process for these goods. Therefore, the process for repairs is different from the schedule

Figure 2. The process of replacing a 4mm Steel Plate and a 6mm Steel Plate
Source: Personal Documentation (2022)

So, in addition to the long process of indenting goods and shipping, there is much consideration and price negotiation from the procurement and finance parties to several vendors who offer goods which are indeed considered based on price, estimated arrival of goods, and the number of goods available.

b. Delays in the communication process on board between the Indonesian crew and the Thai crew.

Several Thai crews working in the tin mining sector in Bangka for a long time could communicate in Indonesian. However, a few Thai crews still needed to understand and communicate in Indonesian. At the same time, the use of international languages, namely English, was also minimal because very few Thai crews were fluent. In the English language, so in terms of communication, is assisted by using hand signals. From this, it is not uncommon for miscommunication between Indonesian and Thai crews to occur, causing delays in the repair process and during operations.

c. Unfavorable weather conditions during work.

The researcher observed the ship with the Technical Superintendent, Port Engineer, and Port Captain. From the results of the observations and observations that had been made, there were several inhibiting factors during the tailing chute repair work, one of which was bad weather or not supporting the work. The high level of risk of work carried out, such as welding and blenders, and the crew's lack of awareness to use Personal Protective Equipment (PPE) while working stopped the work progress and impacted the predetermined schedule.

Figure 3. Tailing Chute Welding Work When the Weather Is Good
Source: Personal Documentation (2022)

3. Efforts made by PT. Orion Transportasi Internasional to overcome the obstacles that occur. The Technical Superintendent and Port Captain make several plans and strategies to overcome the obstacles that occur when repairing tin dumps or tailing chutes, namely:

a. Using spare parts available on other ships for use during repairs.

The use of spare parts on other ships is one of the solutions to delays in the supply of goods used for repairs due to the long indenting and delivery process; this is intended to improve the KIP. Octopus 1 process. Octopus 1 can go on. Retrieval of spare parts is carried out with carelessness but is determined based on the number of needs and the amount of reserve stock on board, namely KIP. Nusa Indah 1, KIP. Babelindo 2, and KIP. Adika Putra 2. In addition to using spare parts available on other ships, one of the things

that the technical division did was to continue to urge the procurement party to immediately procure and purchase the goods needed and exchange goods that had been taken from other ships because these goods are needed.

b. Recruit translators to link communication between Indonesians and Thais.

PT. Orion Transportasi Internasional also recruited a translator, a Thai national who had lived in Indonesia for a long time, so he was fluent in Indonesian and helped communicate with the Thai crew.

c. Maximizing work when the weather supports.

The Technical division team from PT. Orion Transportasi Internasional strives to maximize work when the weather is favorable so that the work is completed according to the repair plan that has been made. Acceleration classification and priority scale of work are essential. If the weather continues to be unfavorable, another solution to speed up repairs is the use of a vast tarpaulin, capable of covering half of the ship's hull, so that repair progress can continue according to the repair time frame that has been made.

Figure 4. Tarpaulin installation
Source: Personal Documentation (2022)

CONCLUSION AND FURTHER RESEARCH

PT. Orion Transportasi Internasional repairs the shape of waste disposal sites or tailings chutes that do not meet government standards and have the potential to cause pollution and damage to sea and coastal areas and conducts outreach to Thai and Indonesian ship crews to comply with applicable rules regarding proper mining methods so as not to damaging marine ecosystems and coastal areas as an effort to protect the sea area and realize a balance of economic and ecological use as well as coordinating with PT. Pelayaran Lomasasta shipping related to processing the document of *Persetujuan Kesesuaian Kegiatan Pemanfaatan Ruang Laut* (PKKPRL). PT. Orion Transportasi Internasional experienced several problems when repairing the tin dump site (Tailing Chute) to overcome environmental damage, including delays in the supply of goods used for repairs due to the long indenting and shipping processes and delays in the communication process at KIP. Octopus 1 between the Indonesian and Thai crews due to language differences and unfavorable weather conditions when working on tin suction vessel repairs. PT. Orion Transportasi Internasional did several things to overcome the problems, including using spare parts available on other ships for repairs, recruiting translators to link communication between Indonesian and Thai crews, and maximizing work when the weather is favorable.

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