*IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*
*Volume 27, Issue 5, Series 7 (May. 2022) 31-46*
*e-ISSN: 2279-0837, p-ISSN: 2279-0845.*
*www.iosrjournals.org*

# The Public's Perception of the Establishment of the Base Metal and Precious Metal Refining Industry

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**ABSTRACT**
Public perception, particularly social studies on environmental impacts, is a critical factor in the smooth establishment and development of the base metal and precious metal processing industries. The purpose of this study is to investigate the public's perception of the establishment of the base metal and precious metal processing industries. The survey method was used in this study to collect information from respondents. Questions were asked either through interviews or through the distribution of questionnaires. The findings revealed that respondents tended to judge that the existence of the industry had a positive impact because it increased the rate of development and the provision of employment and was able to improve the welfare of the surrounding community (the percentage of positive perceptions of questions ranged from 76 to 91 percent), perceptions of the socialization process, in general respondents assessed that the process of socialization was not carried out optimally, Meanwhile, according to the socioeconomic survey, respondents believe that there is no significant impact on sociocultural and environmental conditions, that the impact can be minimized through environmental management guidelines, and that the positive impact is greater than the negative impact. can generate new jobs, boost the regional economy, and encourage community entrepreneurship. The public consultation process resulted in the appointment of six community members to the Environmental Impact Analysis Assessment Commission. Perception studies and community involvement can increase community understanding and active participation, as well as perform supervision, monitoring, and management of the surrounding environment.

**Keywords:** Environmental impact analysis, Community perception, Community involvement, Public consultation, Commission for environmental impact assessment, Potential environmental impact

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Date of Submission: 09-05-2022 Date of Acceptance: 24-05-2022

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## I. Introduction (teori diperbanyak

PT. Nuswantoro Manunggal Jati is a national private company that processes and refines metals, especially base metals and precious metals. Processing, smelting, and refining of base metals and precious metals will be part of the industry. The planned industrial establishment will be located on Jalan Raya Kudus – Pati, KM.11, including the administrative area of Pladen Village, Jekulo District, Kudus Regency on 1.2 ha, with a total building area of 6,103 m2. The industry's installed production capacity is planned to produce the following main products: precious metals gold (Au) = 1 ton/year, silver (Ag) = 3 tons/year, copper (Cu) = 1,150 tons/year, and by-products sludge=24 ton/yr, metal sludge=1,420 ton/yr, and liquid mineral=1,000,000 liter/yr. According to the regulation of the Minister of Environment and Forestry of the Republic of Indonesia Number: P.38/MENLHK/SETJEN/KUM.1/7/2019 concerning types of business plans and activities requiring Environmental Impact Analysis, plans and activities to be carried out by PT. Nuswantoro Manunggal Jati is an activity that requires an environmental impact analysis document. (Sukananda and Nugraha, 2020). This was also confirmed by the decree of the Environment and Forestry Office of Central Java Province Number 660.1/1455 dated February 16, 2021 concerning Guidelines for the Types of environmental documents suitable for the establishment of precious metal processing industries, namely the ANDAL (Environmental Impact Analysis) document (Cahyani, 2021) The business plan of PT. Nuswantoro Manunggal Jati is using a single environmental impact analysis study approach under the coordination and supervision of the Ministry of Industry of the Republic of Indonesia, as per Government Regulation of the Republic of Indonesia number 22 of 2021 concerning the Implementation of Environmental

Protection and Management Article 22 paragraphs 2 (Kent, 2021)(Nugroho and Syahruddin, 2021)

The plan for the establishment of the metal processing and refining industry will be carried out close to the surrounding community, namely Pladen Village, Jekulo District, Kudus Regency, so community involvement and participation at the project site are critical to the smooth operation of this activity. (Hasan, Nahiduzzaman and Aldosary, 2018). The success of establishment cannot be separated from the community's involvement in making it happen, because the community will feel responsible for the success of establishment programs, and community participation can reduce the risk of failure (Saner, Yiu and Nguyen, 2020) . Community involvement will also greatly aid the program's operation and the continuity of activities, allowing it to run smoothly. Community engagement can also be used to forecast how affected communities will react. The community's reaction influences the public's perspective or perception of an activity. The success of an activity is determined by the positive perception of the community surrounding the activity's location (Kanu, Tyonum and Uchegbu, 2018)(Hindrayani, 2018)

The Environmental Impact Assessment document was created with the help of public announcements and consultations with the community (Dwiki, 2018). The procedure for involving the community in the environmental impact analysis process is further regulated by a Ministerial Regulation in Article 9 paragraph 6 of Government Regulation Number 27 of 2012 concerning Environmental Permits, The Act on Environmental Protection and Management (UUPPLH) and Government Regulation Number 27 of 2012 concerning environmental permits have stipulated that the community is involved in the process of Environmental Impact Analysis and environmental permits is (a). Participation in the preparation of the Environmental Impact Analysis document through the process of announcement, submission of suggestions, opinions, and public responses, and public consultation, as well as community participation in the Environmental Impact Analysis assessment commission, for business plans and/or activities that require an Environmental Impact Analysis; (b) The process of announcing environmental permit applications, submitting suggestions, opinions, and public responses, and announcing after environmental permits are issued, both for business plans and/or activities that are required to have an Environmental Impact Analysis and business plans and/or activities that are required to have Environmental Management and Monitoring Efforts. Guidelines for community involvement in Environmental Impact Assessment and environmental permits are required, among other things, to ensure the implementation of community rights and obligations in the field of environmental protection and management, as well as to realize the implementation of a transparent, effective, accountable, and quality environmental permit process. (Dhiksawan *et al.*, 2018)

It is necessary to investigate community perceptions in order to determine the response, acceptance, assessment, and prediction of the impact of activities. A study of community perceptions at the activity site is one component of the social impact analysis (Carley and Bustelo, 2019) People's perceptions are influenced by values from within the individual as a society, as well as things captured through the five senses in the process of seeing, feeling, smelling, hearing, and touching. As internal factors, age, gender, background, education, occupation and income, origin and population status, place of residence, economic status, and leisure time all have a strong influence on perception. (Hafri and Firestone, 2021) These factors are then combined with external factors, specifically the physical and social environment, to produce a response in the form of an action. Perception in this study has a meaning based on this understanding in the form of a response or public view of reality or events occurring around them (Turvey, 2018), As a result, the goal of this research is to describe the community's perceptions and involvement in the plan to establish a metal processing and refining industry.

## II. Methods and Material

The research method used is a survey method, in which questions are asked either through an interview or through the distribution of questionnaires (Sileyew, 2019), with the goal of gathering information from respondents. The public perception study was derived from the results of surveys and interviews with community groups potentially affected by the number of respondents, as many as 50 people from two villages, Terban village and Pladen village.

The population of respondents, namely people who may be affected by the impact, is 97 respondents from two villages, and if converted using the Slovin formula n = N / (1 + (N x e2)) with a margin of error of 10%, the minimum population for the study will be 50 respondents. The population in this study is 50, which is valid because the Slovin formula requires a minimum sample size of 49.2 in order to be valid (Adam, 2021)

The study area's boundaries include social boundaries specifically the space surrounding the planned business and activities, which is the location of various social interactions containing certain norms and values that have been determined (including social systems and structures), in accordance with the processes and social dynamics of society(Lamont and Molnár, 2002) (Salomons and Hoberg, 2014) . In this case, the residential area of Pladen village, Jekulo district, Kudus regency, is expected to undergo fundamental changes as a result of business plans and activities. Figure 1 depicts the location of the research, which was conducted between April 3, 2021, and April 12, 2021

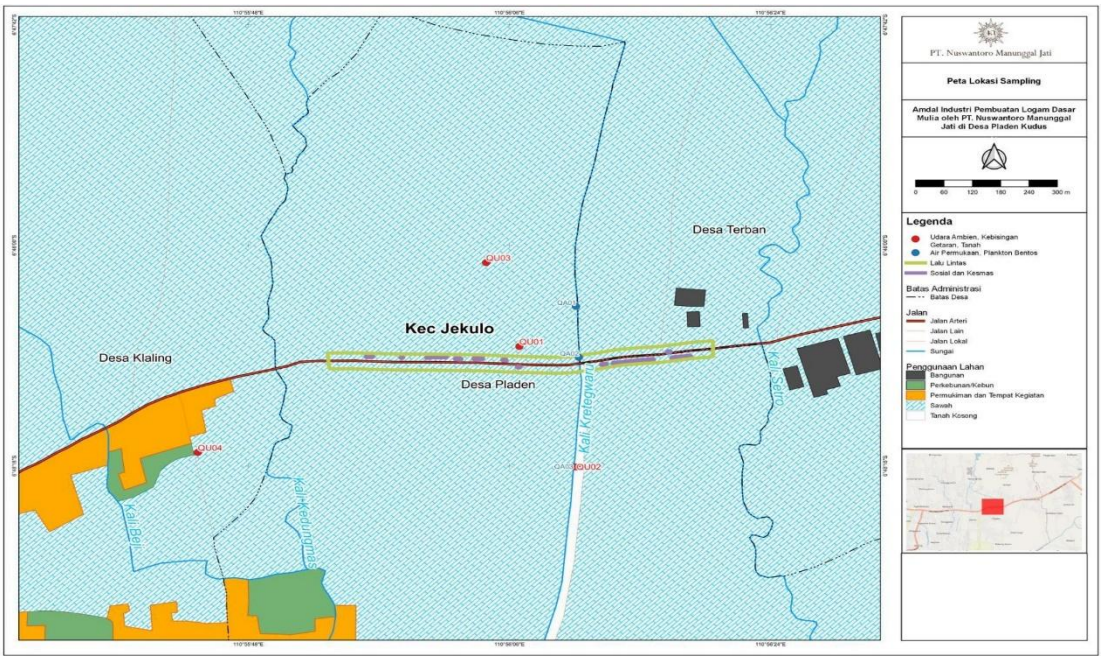

Fig 1. Map of survey locations

## III. Results and Discussion

The location of PT. Nuswantoro Manunggal Jati has complied with the spatial and regional layout, namely the designation of an industrial area, in accordance with the spatial and regional plan of Kudus Regency No. 16 of 2012 (Jaya, 2019).

The land acquisition stage at the research site has been successfully completed, and now the proponent has full authority to carry out the activities of establishing the Base Metal Industry and Refining Precious Metals. However, in order to obtain an operating permit for the establishment, the initiator must first obtain environmental approval through an environmental impact analysis study (Hernanda, 2020) This environmental approval process (environmental permit) will include indicators of community perception and involvement in the project implementation process (Rahmat, 2018). The perception and involvement of the community at the project site can be used as an indicator of activity success; if the community's perception shows a negative perception, the activity will be hampered; therefore, community involvement, outreach activities, and an understanding of the existence of the industry can be used as a solution in growing positive perception (Damanik and Yusuf, 2021)

The establishment of the Precious Base Metal Manufacturing Industry foreshadows a change in social life, particularly in the social, economic, and cultural fields. It is hoped that this establishment will have numerous positive effects on the population. To prepare for all changes in social life, a description of the structure and social conditions of the population affected by establishment in the study area is required. Changes in the mechanism of the social structure, according to Umanailo (2019), are marked by changes in cultural symbols, rules of behavior, social organization, or value systems. According to this theory, the existence of activity determines social behavior. Changes will have an impact on other institutions due to their interconnected nature (Umanailo, 2019) With socialization, clear information, and community involvement, it is hoped that the establishment process can anticipate social issues related to the community related to the process of developing the Precious Base Metal Manufacturing Industry in Kudus Regency, Jekulo district, and Pladen village. (Nasution, Syamsuri and Ichsan, 2021)

**Respondent profile**

Respondents' occupations are quite diverse, including private employees, traders, laborers, farmers, police/army, retirees, and housewives; all respondents are Muslim. As shown in figure 2, the majority of respondents (27%) are housewives, and their education is dominated by high school graduates (42%). The majority of respondents (87%) were of working age, with 51 percent male and 49 percent female. Figure 2 depicts the respondent's profile, which is as follows:

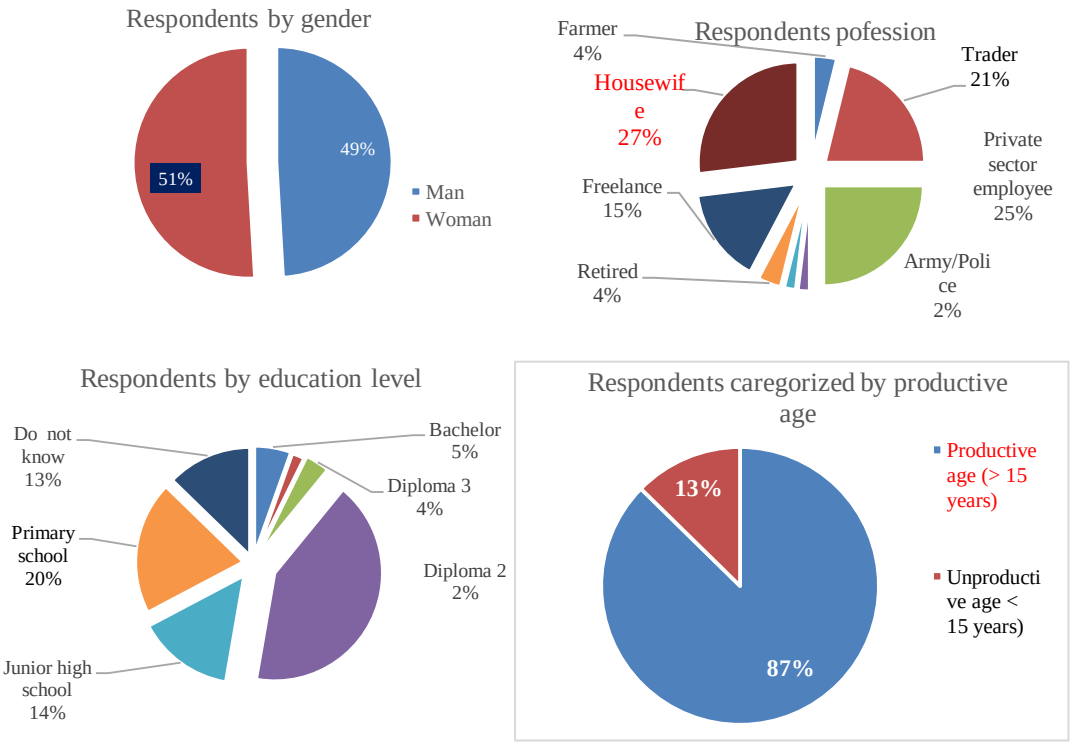


Fig. 2. Respondents are classified based on their gender, occupation, and level of education.

Customs and local wisdom are spiritual values that must be preserved, particularly in the long-term preservation of the environment. Local wisdom (customs of local communities) are noble values that apply in the life of the community to protect and manage the environment in a sustainable manner, according to Law No. 32 of 2009.. Participation of the community in environmental protection and management is an active role. The community's role can take the form of social supervision, offering suggestions, opinions, proposals, objections, and complaints, as well as delivering information about activity reports (Dewi, Sukranatha, and Pranajaya, 2020). Residents in the research location continue to engage in spiritual activities such as recitation, alms of the earth, ruwahan tradition, village clean tradition, and mutual cooperation. Islamic religious values and Javanese culture have a strong influence on these activities. The Socio-Cultural Conditions at the Research Site are depicted in Fig 3 as follows:

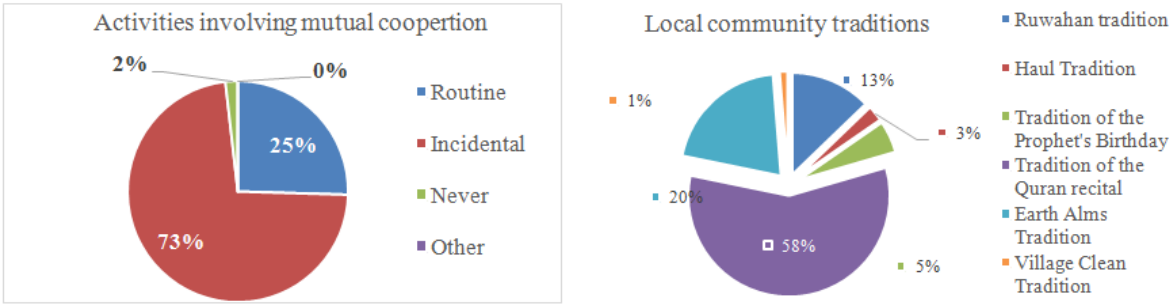


Fig 3. Respondent's social, religious and cultural activities

The intensity of conflict in the respondents' neighborhood is relatively low. If there is a disagreement, deliberation is a method of resolving the disagreement. This local wisdom can be used as social capital for the study area's socioeconomic establishment. Respondents are also receptive to immigrants (fig 4)

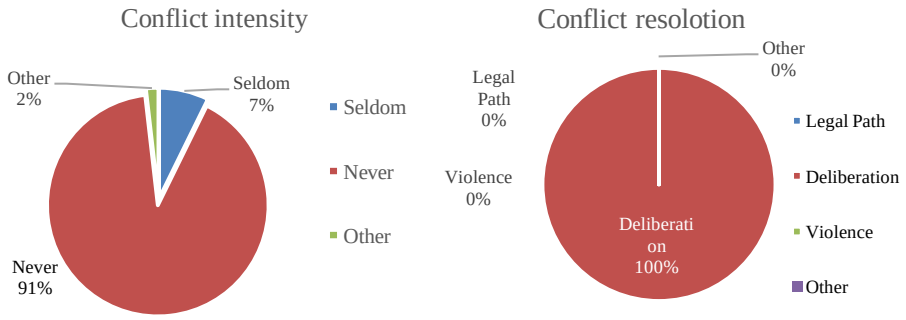


Fig 4. Conflict intensity, and conflict resolution

The establishment of the Precious Base Metal Manufacturing Industry foreshadows a change in social life, particularly in the social, economic, and cultural fields. The establishment of an industry will have numerous societal benefits. To prepare for any changes in social life, it is necessary to describe the population structure and social conditions in the study area. It is hoped that with information on environmentally sound establishment, the establishment process will be able to anticipate community social problems related to the process of developing the Precious Base Metal Processing Industry in Kudus regency, Jekulo district, and Pladen village.

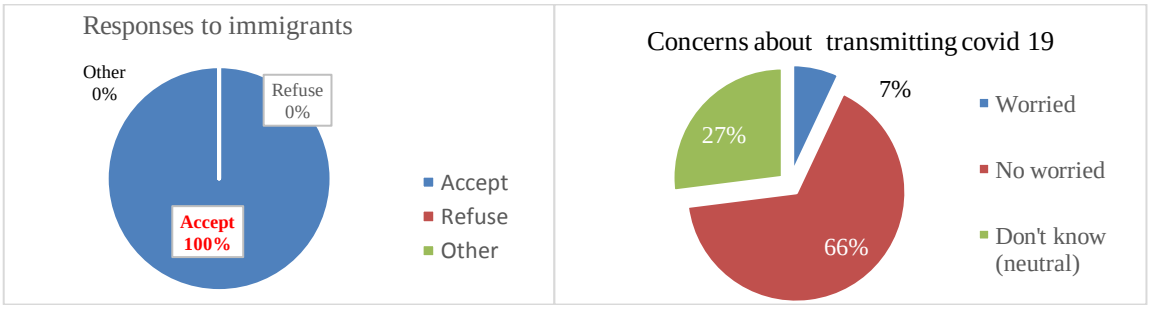


Fig 5. Respondents' reactions to migrant workers and concerns about the spread of communicable diseases Covid 19

Even though the respondent stated that he accepted all construction workers, the respondent was concerned about the possibility of Covid-19 transmission by workers from outside the Kudus district.

Outreach to the surrounding community and provide a report to the local Covid 19 task force (Public Health Center) that all employees of PT Nuswantoro Manunggal Jati have been vaccinated twice, so it is hoped that they will not become a new cluster for the spread of Covid 19. Based on the direction of the President of the Republic of Indonesia on March 15, 2020 regarding efforts to prevent COVID-19, as well as the determination of the Corona outbreak by the Ministry of Health of the Republic of Indonesia as an Extraordinary Event in Indonesia.(Widjaja, 2020) In the context of efforts to prevent the spread and impact of COVID-19 on the implementation of Construction Services, it is necessary to develop a protocol for the Prevention of the Spread of COVID-19 that is part of the overall policy to achieve safety in the construction services sector, including occupational safety and health, public safety, and environmental safety at the location. Construction (Schoen, 2020) (Administration, 2020) then Construction Services must follow the Instruction of the Minister of Public Works and Public Housing Number 02/1N/M/2020 regarding the Protocol to Prevent the Spread of Corona Virus Disease 2019 (Lestari *et al.*, 2022) (fig 6)

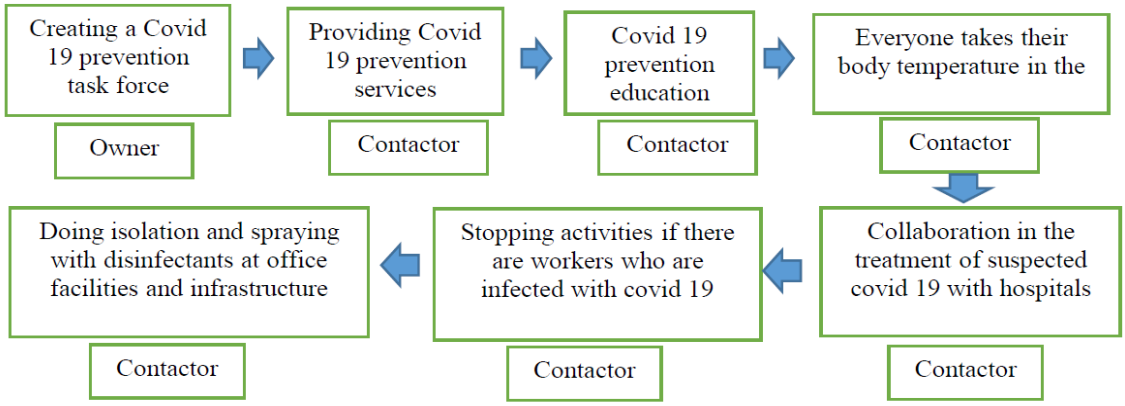


**Fig 6 .** Construction Projects Using the Covid-19 Prevention Protocol

Based on these directives, PT. Nuswantoro Manunggal Jati has carried out the protocol, namely providing health services in the field, is :

a) Established a field health clinic complete with oxygen cylinders, thermometers, blood pressure gauges, medicines, and medical devices.

b) Coordinate emergency responses by collaborating with the nearest hospital and/or health center.

c) In offices and work locations, provide additional facilities such as hand washing (water, soap, and hand sanitizer), tissues, and masks for all employees and visitors/guests.

d) Provide workers with vaccines, vitamins, and extra nutrients to boost worker immunity.

**Public perception of existing environmental conditions**

The results of the socioeconomic survey related to the perception of the existing environment indicate that respondents tend to judge the existing environmental conditions to be relatively conducive in all aspects studied; the survey results are more detailed in table 1, as follows:

Table 1. Respondents' perceptions of the existing environmental conditions

| No. | Statement | Yes | Neutral | No |
|---|---|---|---|---|
| 1 | Is the traffic on the roads relatively smooth at this time (no traffic jams)? | 85% | 5% | 9% |
| 2 | Is the traffic on the village road relatively smooth (no traffic jams) at this time? | 100% | 0% | 0% |
| 3 | Is the current state of the environment's waterways relatively smooth, with no floods? | 80% | 5% | 15% |
| 4 | Is the current state of the environment very clean (not a lot of garbage)? | 93% | 7% | 0% |
| 5 | Is the current method of dealing with environmental waste very effective? | 93% | 7% | 0% |
| 6 | Is the current state of environmental and public health satisfactory? | 91% | 9% | 0% |
| 7 | Is the current electricity supply and electricity network adequate? | 93% | 7% | 0% |
| 8 | Is the current supply of clean water and the clean water network adequate? | 85% | 7% | 7% |
| 9 | Is the current state of environmental security and crime very good? | 96% | 4% | 0% |
| 10 | Is the current economic situation of the residents satisfactory? | 80% | 18% | 2% |
| 11 | Is the current level of environmental religiosity satisfactory? | 80% | 18% | 2% |
| 12 | Is the current environmental situation conducive to schoolchildren's learning? | 78% | 22% | 0% |
| 13 | Is the atmosphere quiet at this time? | 85% | 7% | 7% |
| 14 | Is the air quality relatively clean at this time (not much dust)? | 84% | 9% | 7% |
| 15 | Is the air environment relatively clean of harmful air pollutants at this time? | 87% | 9% | 4% |
| 16 | Is the environment relatively odorless at this time (rotten odor, garbage odor, sewer odor, or pungent odor)? | 85% | 9% | 5% |
| 17 | Is the environment relatively calm at this time (no noticeable vibration)? | 87% | 11% | 2% |

| | | | | |
|---|---|---|---|---|
| 18 | Has a fire ever broken out in the vicinity of a resident's home at this time? | 100% | 0% | 0% |
| 19 | Is the current level of environmental religiosity satisfactory? | 100% | 0% | 0% |
| 20 | Is the current environmental situation conducive to schoolchildren's learning? | 85% | 0% | 15% |
| 21 | Is the current condition of the road very good (paved/concrete, flat and not potholed)? | 85% | 5% | 9% |
| 22 | Is the current condition of the roads in the village area very good (paved/concrete, flat and not potholed)? | 96% | 0% | 4% |
| 23 | Is the current condition of community harmony very good? | 98% | 2% | 0% |
| 24 | Is the current social environment very conducive? | 98% | 2% | 0% |

Source: April 2021 social survey

**Perception of the establishment of the base metal and precious metal manufacturing industry**

The results of a socio-economic survey related to public perception indicate that respondents tend to rate the establishment of the precious base metal manufacturing industry in Pladen Village as having a positive impact because of the pace of establishment and the provision of jobs in Kudus Regency, as well as being able to improve the welfare of the surrounding community. Table 2 shows the percentage of positive perceptions of the question ranging from 76 to 91 percent.

Table 2. Perception of the establishment of the base metal and precious metal manufacturing industry

| No. | Statement | Yes | Neutral | No |
|---|---|---|---|---|
| 1 | Can the establishment of a precious base metal processing industry in Pladen Village accelerate establishment in Kudus Regency? | 76% | 24% | 0% |
| 2 | Can the establishment of a precious base metal processing industry in Pladen Village increase the availability of job opportunities in the Kudus Regency/City? | 91% | 9% | 0% |
| 3 | Is the establishment of a precious base metal processing industry in Pladen Village beneficial to the surrounding community? | 87% | 13% | 0% |

Source: April 2021 social survey

**Community involvement activities for the establishment of basic metal and precious metal processing industries**

Table 4 shows the survey results regarding the perception of the socialization process and community support for the establishment of a precious base metal processing industry in Pladen Village. In general, respondents considered that the socialization process had not been carried out optimally, but respondents supported the establishment of the precious base metal processing industry in Pladen Village, because it is estimated that the existence of the precious base metal processing industry in Pladen Village will continue to grow and have more positive than negative consequences.

Table 3. Socialization responses and community support

| No | Statement | Yes | Neutral | No |
|---|---|---|---|---|
| 1 | Is the socialization process for the production of precious base metals in Pladen Village going well? | 25% | 24% | 51% |
| 2 | Do you agree with and support the establishment of the precious base metal processing industry in Pladen Village? | 75% | 20% | 5% |
| 3 | Is the base metal processing industry in Pladen Village having more positive than negative effects? | 55% | 38% | 7% |

Source: April 2021 social survey

Figure 4 illustrates the respondents' strongest impression on the impact of establishing a precious base metal manufacturing industry in Pladen Village. The first thing that respondents remember about the positive impact is an increase in job opportunities, while the first thing they remember about the negative impact is factory pollution, especially water and air pollution.

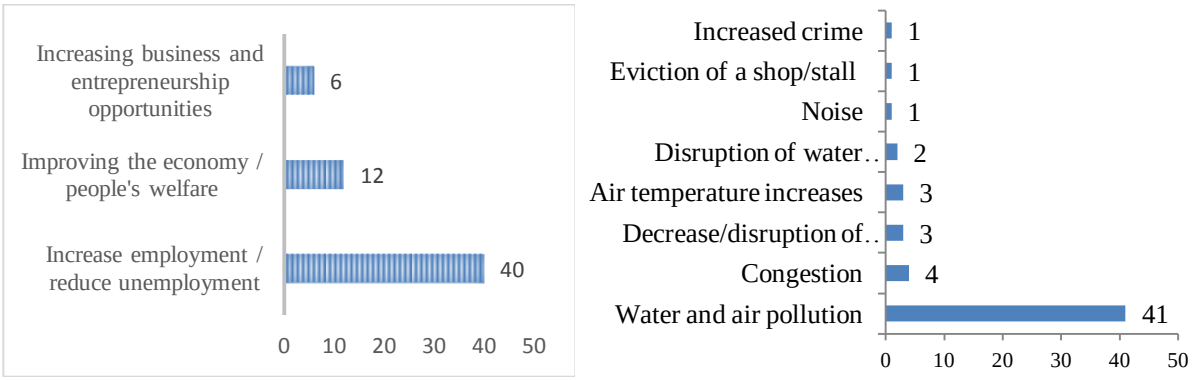


Figure 7. Respondents' perceptions of positive and negative impacts

According to the findings of a more detailed socioeconomic survey on the perceived impact of the establishment of a precious metal processing industry in Pladen Village, respondents believe there was no public unrest during the pre-construction stage. Respondents assessed that the negative impact was not significant at the construction stage, due to the potential for public unrest, decreased water quality, disturbance of aquatic biota, decreased ambient air quality, noise, vibration, congestion, road damage, flooding, and a decrease in the number of flora, whereas the positive impact was significant. because the establishment of the industry creates job opportunities, boosts the regional economy, and fosters community entrepreneurship.

**The potential impact of the precious base metal manufacturing industry's establishment**

Potential impacts are significant impacts that have the potential to disrupt the environment and humans, occur due to the planned activity of the Precious Base Metal Manufacturing Industry's Establishment at Pladen Village, Jekulo District, Kudus Regency (Campanale *et al.*, 2020)

Table 4. **The potential impact of the precious base metal manufacturing industry's establishment**

| No | Statement | Yes | Neutral | No |
|---|---|---|---|---|
| A. | Did the following impacts occur during the pre-construction (land acquisition) stage? | | | |
| 1. | Is there public unrest? | 5% | 18% | 76% |
| B. | During the construction phase, did the following impacts occur? | | | |
| 1 | Job opportunities are being created (job vacancies) | 51% | 45% | 4% |
| 2 | Making new business connections (entrepreneurial) | 64% | 35% | 2% |
| 3 | Are there any community concerns about: | | | |
| | a.Recruitment of construction workers | 7% | 47% | 45% |
| | b.The maturation of land | 9% | 47% | 44% |
| | c.Construction of a building (main and supporting) | 7% | 44% | 49% |
| | d.Mobilization of equipment | 7% | 35% | 58% |
| | e.Mobilization of resources | 9% | 33% | 58% |
| 4 | Decrease in surface water quality as a result of land maturation activities | 18% | 27% | 55% |
| 5 | Disturbance of aquatic biota as a result of land maturation activities | 4% | 40% | 56% |
| 6 | Has there been a decrease in ambient air quality, related to activities? | | | |
| | a.Land maturation | 16% | 36% | 47% |
| | b.Building construction (main and supporting) | 15% | 36% | 49% |
| | c.Equipment mobilization | 15% | 36% | 49% |
| | d.Material mobilization | 16% | 36% | 47% |
| 7 | Is there an increase in noise as a result of activities? | | | |
| | a.Land maturation | 9% | 24% | 67% |
| | b.Building construction (main and supporting) | 9% | 22% | 69% |
| | c.Equipment mobilization | 13% | 20% | 67% |
| | d.Material mobilization | 9% | 27% | 64% |
| 8 | Is there an increase in vibration as a result of activities? | | | |

| | | | | |
|---|---|---|---|---|
| | a.Land maturation | 4% | 27% | 69% |
| | b.Building construction (main and supporting) | 5% | 25% | 69% |
| | c.Equipment mobilization | 4% | 27% | 69% |
| | d.Material mobilization | 4% | 27% | 69% |
| 9 | Increased congestion, related to activities | | | |
| | a.Equipment mobilization | 27% | 16% | 56% |
| | b.Material mobilization | 27% | 15% | 58% |
| 10 | Increased road damage, related to activities | | | |
| | a.Equipment mobilization | 16% | 22% | 62% |
| | b.Mobilization materials | 16% | 22% | 62% |
| 11 | Increased damage to village environmental roads, related to activities | | | |
| | a.Equipment mobilization | 2% | 18% | 80% |
| | b.Mobilization materials | 2% | 18% | 80% |
| 12 | Flood disturbances, related to activities | | | |
| | a.Land maturation | 4% | 16% | 80% |
| | b.Building construction (main and supporting) | 4% | 16% | 80% |
| | c.Equipment mobilization | 4% | 20% | 76% |
| | d.Mobilization materials | 4% | 18% | 78% |
| 13 | Decrease in the number of flora, related to land maturation activities | 2% | 31% | 67% |
| C. | Did the following impacts occur during the operation stage? | | | |
| 1 | Opening of job opportunities (job vacancies) | 65% | 33% | 2% |
| 2 | Opening business opportunities (entrepreneurial) | 76% | 24% | 0% |
| 3 | Decline in surface water quality | 15% | 31% | 55% |
| 4 | Decreasing subsurface water quality | 22% | 29% | 49% |
| 5 | Disturbance of aquatic biota | 0% | 42% | 58% |
| 6 | Noise enhancement | 7% | 27% | 65% |
| 7 | Vibration enhancement | 5% | 25% | 69% |
| 8 | Decreased ambient air quality | 36% | 33% | 31% |
| 9 | Air pollution by hazardous materials | 44% | 22% | 35% |
| 10 | Increased traffic jam | 29% | 35% | 36% |
| 11 | Increased damage to village roads | 4% | 20% | 76% |
| 12 | Increased flooding and waterlogging | 4% | 20% | 76% |
| 13 | Public unrest | 11% | 18% | 71% |
| 14 | Increased intensity of social conflict | 2% | 22% | 76% |
| 15 | Decreasing environmental sanitation | 2% | 40% | 58% |
| 16 | Increased hazardous and toxic waste | 11% | 42% | 47% |

Source: April 2021 social survey

During the operational phase, respondents were most concerned about air pollution with hazardous materials and a decrease in ambient air quality. Better job opportunities and entrepreneurship were cited as two significant positive impacts by respondents. A matrix of environmental management and monitoring directives has been prepared to alleviate concerns about negative consequences. The matrix serves as a guide for environmental monitoring and management, which is required for decision-making regarding the establishment of businesses and activities (Sikdar, 2021) Annex 1 shows a more detailed matrix of environmental management and monitoring directions.

**Community engagement results**

The implementation of public announcements and consultations is based on Articles 31–35 of Government Regulation Number 22 of 2021 on Environmental Protection and Management. on Friday, February 19, 2021, the announcement of business plans and activities in the context of the environmental impact analysis study was made via Radar Kudus's mass media. Announcements were also posted at the project site, the Pladen village office, the District Office, the Housing Service, the Kudus Regency Environment and Forestry Service, and the Central Java Province Environment and Forestry Service.

The public consultation will take place at the Pladen Village Hall on Friday, March 12, 2021. The public consultation will be held by inviting representatives from the Housing and Settlement Service, the Environment and

Forestry Service, PT. Nuswantoro Manunggal Jati as the initiator, consultant for planning and environmental impact analysis, sector police, regional military command, sub-district head, village head, community leaders, and representatives of affected communities.

The business plans and/or activities were welcomed by the community surrounding PT. Nuswantoro Manunggal Jati. However, the community around the project location is given priority in terms of being properly empowered as workers, industrial operations will comply with the recommendations from the environmental impact analysis, will not pollute the air, soil, or noise, and cooperation between actors is required. To avoid a public outcry, business, government, and law enforcement must work together.

The public consultation activity also determines who will take part in the feasibility test as a member of the Environmental Impact Analysis Commission, this shows that the involvement of the community in the establishment of the precious metal processing industry, so that the surrounding community feels concerned and has a sense of belonging. Table 5, shows a list of the names of the people who were elected to the EIA assessment commission. It is hoped that members of the Environmental Impact Assessment Commission will be able to supervise, monitor, and manage the surrounding environment.

Table 5 . Elected community representatives

| No | Name | Address | Description |
|---|---|---|---|
| 1 | Disguised name | Pladen RT04 / RW03 | Landowners |
| 2 | Disguised name | Pladen RT04 / RW03 | Landowners |
| 3 | Disguised name | Pladen RT03 / RW02 | Landowners |
| 4 | Disguised name | Pladen RT03 / RW01 | Landowners |
| 5 | Disguised name | Pladen RT02 / RW03 | community leaders |
| 6 | Disguised name | PT. Prima THI | Landlord's representative |

## IV. Conclusion

In general, the community's perception of industrial locations is positive; most respondents agree with the existence of the base metal and precious metal processing industry on Kudus – Pati street , KM.11 in Pladen village, Kudus, while a small proportion disagrees and is not significant; and stakeholder outreach activities to affected communities were deemed inadequate; however, these problems were minimized by public consultation and providing guidance on environmental issues.

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Annex 1. Instructions for environmental management and environmental monitoring

| No | Impact | Impact Source | Environmental Management Instructions | Environmental Monitoring Instructions |
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| Construction Stage | | | | |
| 1. | Available job openings | Recruitment of labor. | a. Prioritizing the local community of Kudus Regency in recruiting workers based on qualifications and needs.<br>b. Work with the Jekulo District Government and Pladen Village to recruit workers, as well as the Kudus Regency Office of Manpower, Industry, and Cooperatives. | a. Data collection methods include observing and distributing questionnaires, as well as conducting interviews related to the implementation of recruitment, including involving local workers in construction activities.<br>b. Analysis method: Qualitative descriptive analysis |
| 2. | Income fluctuation | Recruitment of labor. | a. Payment of labor wages in accordance with applicable laws and regulations.<br>b. Wages are adjusted in accordance with the Kudus Regency Minimum Wage.<br>c. Allow local communities to conduct business | a. Data collection methods include conducting observations and/or distributing questionnaires, as well as conducting interviews to determine the turnover of local merchants, the number of local workers involved, and the wages of the local workers involved.<br>b. Method of Analysis: Qualitative descriptive analysis |

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| | | | activities near the project site. | |
| 3. | Air quality has deteriorated. | Equipment and materials are being mobilized. | a. Driving a roadworthy vehicle, passing the emission test, and maintaining a valid certificate of passing the motor vehicle test on a regular basis.<br>b. Limiting the number of convoys / convoys of transport vehicles (traffic restraint).<br>c. Covering the tailgate of the transport truck with a tarpaulin or similar tool to reduce the impact of dust and soil/sand spills.<br>d. Before leaving the project site, clean the dirt/mud off the vehicle's wheels.<br>e. Water the site material and equipment transportation routes around the project site on a regular basis, especially during the dry season, in order to reduce the impact of dust.<br>f. Clean up spilled soil, sand, or other materials on project-related transportation routes.<br>g. Observing road traffic conditions to limit the speed of transport vehicles to less than 60 km/h. | Data collection method:<br>a. Observations on the closure of transportation means that have the potential to cause dust, the speed of passing transport vehicles, efforts to clean vehicle wheels, efforts to clean up spilled materials.<br>b. Direct sampling of air in the field in accordance with applicable National Standards, including the use of impinger and dust sampler.<br>Method of Analysis:<br>a. Laboratory analysis with Pararosanilin (SO2), Saltzman (NO2), NDIR (CO), and Gravimetric (dust) methods.<br>b. Comparing measurement results to baseline and quality standards based on Attachment VII Ambient Air Quality Standards to Government Regulation Number 22 of 2021. |
| 4. | Changes in public perception | Material and equipment mobilization | a. Conducting socialization to the public regarding the implementation of the establishment of the precious metal industry<br>b. Provide a complaint post that is easily accessible by the public<br>c. Receive and respond to input/complaints regarding the mobilization/demobilization of equipment and materials.<br>d. In collaboration with the Pladen Village Government, Terban Village Government, and Jekulo Regency. | Methods of data collection include conducting observations, distributing questionnaires, and/or conducting interviews, which include:<br>a. Manpower recruitment mechanism and announcement of worker recruitment.<br>b. The number of local workers and their qualifications.<br>c. The number of businesses in the vicinity of the project site.<br>d. The response of the community.<br>Method of analysis: Descriptive qualitative analysis |
| 5. | The prevalence of disease | Material and equipment mobilization | a. Control the deterioration of the quality of the ambient air.<br>b. Coordination with relevant agencies such as the Kudus District Health Office and the Jekulo Health Center is required.. | Data collection methods include<br>a. Conducting observations, distributing questionnaires, and conducting interviews on the management of the impact of decreasing air quality.<br>b. Secondary data on community disease patterns are being collected.<br>Analysis methods include tabulation and descriptive qualitative analysis. |
| 6. | Increased surface water runoff | Land Preparation | a. Cleaning up any garbage or sediment that accumulates on a regular basis.<br>b. Creating temporary or permanent water channels to ensure that water flows smoothly and that rainwater does not run off into the environment.<br>c. Waterway dimensions in the project area change in response to topographic conditions and rainfall intensity.<br>d. Construct a talud or guard to prevent soil from entering nearby waterways.<br>e. Ensuring that the project area's drainage channel empties into the Kretekwaru River | Data collection methods include conducting observations and/or distributing questionnaires and/or conducting interviews on topics such as:<br>a) the occurrence of water runoff (flooding)<br>b) the creation of temporary or permanent channels<br>c) Efforts to remove materials that obstruct the canal's water flow.<br><br>Method of Analysis: Qualitative descriptive analysis |
| 7 | Decline in the quality of surface water | Land Preparation | a. Construct a sludge settling pond at the end of the water channel where the land matures before entering the Kretekwaru River.<br>b. Maintaining the sludge settling pond's depth to keep it operational. | Data collection method:<br>a. Observing: drainage channels around the site of land preparation, efforts to handle sedimentation with settling ponds, drainage channel maintenance and maintenance.<br>b. SNI river sampling standard 6989.59:2008<br>Method of Analysis:<br>a. Laboratory analysis using SNI 06-6989<br>b. Comparing waste river water measurement results to quality standards based on Government Regulation No. 22 of 2021, Attachment VI of National Water Quality Standards. |
| 8. | Decreased ambient air quality | Land Preparation | a. Using construction equipment in accordance with technical specifications and needs.<br>b. Water the project site as needed to reduce the impact of dust.<br>c. Install a project fence made of zinc or other materials, with a minimum height of 2 meters or | Data collection method:<br>a. Observing: the closure of transport material that has the potential to cause dust, efforts to clean vehicle wheels, efforts to clean up spilled material, efforts to water the land maturation area, and the installation of a safety fence around the project site.<br>b. Use an impinger and dust sampler to conduct |

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| | | | adjusted to the needs and conditions of the surrounding area. | direct air sampling in the field in accordance with applicable SNI.<br>Method of Analysis:<br>a. Pararosanilin (SO2), Saltzman (NO2), NDIR (CO), and Gravimetric (dust) methods were used in the laboratory.<br>b. Comparing measurement results to baseline and quality standards established by Government Regulation Number 22 of 2021, Attachment VII Ambient Air Quality Standard. |
| 9 | Noise level has increased. | Land Preparation | a. Using construction equipment in accordance with technical specifications and needs.<br>b. Scheduling work to be completed outside of community break hours (20.00 – 06.00).<br>c. Install a project fence made of zinc or other materials, with a minimum height of 2 meters or adjusted to the needs and conditions of the surrounding area. | Data collection method:<br>a. Observing the implementation of land preparation activities, as well as the installation of guardrails around the project site.<br>b. Noise measurement in the field with the sound level meter.<br>Analysis method:<br>a. Calculating the difference between day and night noise levels<br>b. Comparing the measurement results to the baseline and quality standards established by state minister of environment decree No.48/MENLH/11/1996. |
| 10 | Changes in people's perceptions and attitudes | Land Preparation | a. Manage the impact of reduced ambient air quality<br>b. Manage the impact of increased surface runoff<br>c. Manage the impact of reduced surface water quality<br>d. Manage the impact of increased noise<br>e. Socialize the establishment plan to the surrounding community.<br>f. Coordinate with the community on public facilities and infrastructure that may be disrupted.<br>g. Coordinate with the Pladen Village Government and the surrounding community if construction activities are required during community breaks (20.00 WIB – 06.00 WIB) andmMake complaint posts easily accessible to the public.<br>h. Accommodate and respond to input/complaints about the land preparation. | 1. Analysis method: Qualitative descriptive analysis<br>2. Data collection methods:<br>3. Conducting observations and/or distributing questionnaires, and/or interviews, which include:<br>a. Management of the impact of decreasing ambient air quality, increasing surface runoff, decreasing surface water quality, and noise.<br>b. Coordination with the community on public facilities and infrastructure that are likely to be disturbed.<br>ec. Coordination with pladen village and terban village governments.<br>d. Availability of complaint posts and public responses.<br>4. Analysis method: qualitative descriptive analysis |
| 11. | Reduced air quality | Construction of main and supporting buildings | a. Using construction equipment in accordance with technical specifications and needs.<br>b. Install a project fence made of zinc or other materials, with a minimum height of 2 meters or adjusted to the needs and conditions of the surrounding area. | Method of collecting data:<br>a) Observing: the closure of transport materials that may cause dust, efforts to clean vehicle wheels, efforts to clean up spilled material, efforts to water the land maturation area, and the installation of safety fences around the project site.<br>b) Conduct direct air sampling in the field in accordance with applicable SNI, including the use of an impinger and a dust sampler, among other things.<br>Method of Analysis:<br>a) Laboratory analysis using the Pararosanilin (SO2), Saltzman (NO2), NDIR (CO), and Gravimetric (dust) methods.<br>b) Comparing measurement results to baseline and quality standards based on Government Regulation Number 22 of 2021, Attachment VII Ambient Air Quality Standards. |
| 12. | Noise level has increased. | Construction of main and supporting buildings | a. Using construction equipment in accordance with technical specifications and needs.<br>b. Choosing a tool with a lower noise level.<br>c. Scheduling work to be completed outside of community break hours (20.00 – 06.00).<br>d. Install a project fence made of zinc or other materials, with a minimum height of 2 meters or adjusted to the needs and conditions of the surrounding location. | Data collection method:<br>a. Observing the implementation time of building construction activities, as well as the installation of guardrails around the project site.<br>b. The Sound Level meter is used to directly measure noise in the field.<br>Examine Method for calculating the level of noise during the day and night (NGO) and Comparing measurement results to the baseline and quality standards established by State Minister of the Environment Decree No.48/MENLH/11/1996. |
| 13. | Vibration enhancement | Construction of | a. Scheduling work to be completed outside of community break hours (20.00 – 06.00 WIB).<br>b. Documentation of the condition of the | Data collection method:<br>a. Observing: time of building construction activity implementation, construction equipment used, |

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| | main and supporting buildings | surrounding buildings prior to the implementation of the physical work phase of the building and other facilities within a 25-meter radius of the project location.<br>c. Observing complaints about building damage that are suspected to be the result of project activities.<br>d. Accountable for building damage caused by project activities.<br>e. Collaborate with the community surrounding the project site. | documentation of the condition of surrounding buildings prior to project implementation, forms of responsibility in case of building damage due to building physical work activities.<br>b. Measurement of direct vibration in the field with a vibration analyzer, accelerometer, and/or seismometer.<br>Analysis Method:<br>a. Determine the vibration speed and deviation.<br>b. Comparing the measurement results to the baseline and quality standards established by State Minister of Environment Decree No.49/MENLH/11/1996. |
| 14. | Changes in public perception | Construction of main and supporting buildings | a. Control the effects of poor air quality and dealing with the consequences of increased noise<br>b. Control the effects of increased vibration<br>c. Organizing community outreach for establishment activities<br>d. Coordination with the community on public facilities and infrastructure that will be impacted.<br>e. If construction activities are required during community breaks (20:00 – 06.00 WIB), coordinate with the Pladen Village Government and the community around the project site.<br>f. Provide easily accessible complaint posts to the general public.<br>g. Accept and respond to feedback/complaints about the main and supporting buildings' construction. | Data collection methods: conducting observations and/or distribution questionnaires, and/or interviews, which include:<br>a. Management of the impact of decreasing ambient air quality, increasing noise, increasing vibration.<br>b. Dissemination of socialization to the community related to establishment activities.<br>c. Coordination with the community on public facilities and infrastructure that are likely to be disrupted.<br>d. Coordination with Pladen Village and Terban Village Governments.<br>e. Availability of complaint post<br>f. Community response.<br>Analysis method: Qualitative descriptive analysis |
| 15. | Prevalence of disease | Construction of main and supporting buildings | a. Provide adequate and healthy sanitation facilities, such as latrines, toilets, and trash cans, throughout the project area.<br>b. Provide masks tailored to the needs and abilities of the surrounding community.<br>c. Provide construction workers with personal protective equipment (PPE), particularly masks.<br>d. Make first-aid facilities available, particularly for construction workers.<br>e. Collaborate with the Jekulo Health Center. | a. Data collection methods include conducting observations, distributing questionnaires, and/or conducting interviews to learn about the disease patterns of the community surrounding the project site, labor disease patterns, and the number and types of environmental-based diseases that occur.<br>b. Method of Analysis: Qualitative descriptive analysis |
| **Operation stage** | | | |
| 16. | Job openings | Recruitment of Operations Workforce. | a. Prioritizing industrial workers from the local community.<br>b. In terms of labor recruitment, coordinate with the Pladen Village Government, Terban Village, and Jekulo District. | a. Data collection methods include conducting observations, distributing questionnaires, and/or conducting interviews related to recruitment implementation, which includes involving local workers in operational activities.<br>b. Method of analysis: Qualitative descriptive analysis |
| 17. | Changes in income | Recruitment of Operations Workforce. | Strive to have workers or employees in the precious base metal processing industry paid on a monthly basis at the Kudus Regency minimum wage. | Methods for gathering data include observing and/or distributing questionnaires, as well as interviewing the number of local workers involved and the amount of wages received.<br>Method of analysis: Descriptive qualitative analysis |
| 16. | Decline in the quality of surface water | Industrial Operations. | a. Do not dispose of liquid waste directly into surface water bodies<br>b. Wastewater is treated in a liquid waste treatment plant before being channeled into surface water bodies | Method of collecting data:<br>a. Observation: waste water disposal and wastewater treatment in Wastewater Treatment Plant (WWTP)<br>b. River sampling (SNI 6989.57:2008)<br>Analysis Method:<br>a. Analysis in the laboratory using SNI 06-6989<br>b. Comparison of measurement results of waste river water with quality standards based on Government Regulation Number 22 of 2021, Attachment VI of National Water Quality Standards. |
| 17. | The quality and quantity of ground water is deteriorating. | Industrial Operations. | a. Do not discharge waste water directly into bodies of water.<br>and wastewater from industrial activities is routed to a wastewater treatment plant.<br>b. Coordinate the construction and operation of wastewater treatment plants with relevant agencies from the Kudus Regency's Office of Housing, Settlement Areas, and the Environment.<br>c. Maintain wastewater treatment plants on a regular | Data collection method:<br>a. Observing: the operation of the wastewater treatment plant, the sewerage channel that connects each building block to the wastewater treatment plant, and the maintenance and care of the wastewater treatment plant.<br>b. Groundwater/well sampling in industrial areas SNI 6989.58:2008<br>Analysis Method:<br>a. Analysis in the laboratory using a |

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| | | basis.<br>d. Use groundwater effectively and efficiently as needed.<br>e. Constructing infiltration wells and biopore holes in and around industrial zones.<br>f. Keep green open spaces in industrial areas in good condition.<br>g. Groundwater withdrawal is governed by applicable regulations, such as Central Java Provincial Regulation Number 3 of 2018 on Groundwater Management.<br>h. Apply to the Department of Energy and Mineral Resources of Central Java Province for a permit for the utilization and use of groundwater. | spectrophotometer.<br>b. Comparison of groundwater measurement results with quality standards based on Minister of Health Regulation No. 32 of 2017. |
| 18. Soil degradation | Industrial Operations. | a. Never dump waste water directly into the ground.<br>b. Wastewater from industrial activities is routed to a wastewater treatment plant.<br>c. Emissions from the manufacturing process do not exceed the quality standard.<br>d. No direct or impromptu emission.<br>e. Install a chimney in accordance with technical specifications.. | Soil sampling around an industrial area was used to collect data.<br>Analysis Method:<br>a) Laboratory analysis using the USEPA 3050 method B:1996 and the APHA 3125<br>b) B:2017 (Arsenic, Selenium, Cadmium, Chrome, Copper, Lead, Manganese, Nickel, Zinc) and USEPA 3050 B:1996 & USEPA Method 6020.A-1998 (Arsenic, Selenium, Cadmium, Chrome, Copper, Lead, Manganese, Nickel, Zinc) (Mercury).<br>c) Comparing soil quality measurement results to Government Regulation Number 22 of 2021 Attachment XIII. |
| 19. Increased air emissions | Industrial Operations. | a. No direct emission or sudden release of emissions and dispose of non-fugitive emissions through the chimney.<br>b. Do not add air to the chimney after the control device, outside of the activity operation process.<br>c. Install a chimney in accordance with technical requirements.<br>d. Consistently monitoring ambient air quality and emission concentrations.<br>e. Implement emission reduction and reuse measures.<br>f. Coordinate with relevant agencies. | a. Data collection method:<br>Collecting air samples in accordance with SNI 7117.<br>b. Analysis Method:<br>a) Laboratory analysis using SNI 7117.18:2009 (SO2) and SNI 7117.17:2009 methods.<br>b) Comparing the results of measurement of quality standards for immovable source emissions for other types of activities based on Ministry of Environment Decree 13/1995 Attachment VB |
| 20. Reduced air quality | Industrial Operations. | 1. Check that the emission control device is operational and carry out reforestation in industrial areas of Pladen Village in accordance with Minister of Public Works Regulation No. 05/PRT/M/2012 concerning Guidelines for Planting Trees in the Road Network System and Minister of Public Works Regulation No. 05/PRT/M/2008 concerning Guidelines for Provision and Utilization of Green Open Space in Urban Areas and/or other related regulations that are still in effect.<br>2. Coordinate the establishment and maintenance of green open spaces with relevant agencies such as the Kudus Regency's Office of Housing, Settlement Areas, and the Environment (RTH). | a. Method of collecting data:<br>Carry out air sampling in accordance with the applicable Indonesian National Standard.]<br>b. Metode Analisis:<br>a) Laboratory analysis using SNI 7119-7:2017 (SO2), SNI 7119-2:2017 (NO2), SNI 7119-10:2011 (CO), and SNI7119-3:2017 methods (TSP).<br>b) Contrasting measurement results with quality standards established by Government Regulation Number 22 of 2021, Attachment VII Ambient Air Quality Standards. |
| 21. Disturbance to aquatic biota | Industrial Operations. | a) Do not dispose of waste water directly into waterways.<br>b) Wastewater coming from each kiosk is channeled to the wastewater treatment plant.<br>c) Coordinate with related agencies between the Office of Housing, Settlement Areas, and the Environment of Kudus Regency in the construction and operation of wastewater treatment plants.<br>d) Perform routine maintenance on wastewater treatment plants. | a. Data collection method: SNI 13-4717-1998 (plankton) and SNI 13-4718-1998 (benthos).<br>b. Analysis Method: SNI 06-3963-1995 and calculate the diversity index |
| 22. Reduced air quality | Industrial Operations. | a. Manage the impact of decreasing ground water quality and quantity;<br>b. Manage the decline in soil quality;<br>c. Manage the increase in air emissions<br>d. Manage the decrease in ambient air quality.<br>e. Aquatic biota management<br>f. Make complaint posts easily accessible to the public.<br>g. Accommodate and respond to input/complaints received regarding the main and supporting buildings' construction. | 1. Data collection methods include conducting observations and/or distributing questionnaires and/or conducting interviews, which include:<br>a. Management of the impact of decreasing ground water quality and quantity, decreasing soil quality, increasing air emissions, ambient air quality, aquatic biota.<br>b. Complaint post availability<br>c. Community response<br>2. Method of analysis: Qualitative descriptive analysis |

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| | | h. Coordinate the settlement with the governments of Pladen Village, Terban Village, and Pladen District. | |
| 23. | Toxic hazardous waste | Industrial Operations. | a. Develop Standard Operating Procedures (SOP) for storing B3 waste and dealing with emergencies.<br>b. Placing all B3 waste in Temporary Storage of B3 Waste in a location that already has a permit and delegating management to a third party with a permit.<br>c. Perform B3 waste identification, inventory, recording, and reporting in the B3 Waste Temporary Storage.<br>d. According to Government Regulation No. 22 of 2021.<br>e. Base on Regulation P.12/Menlhk/Setjen/Plb.3/5/2020 of the Minister of Environment and Forestry of the Republic of Indonesia Concerning the Storage of Hazardous and Toxic Waste. | Data collection methods:<br>a. Make observations and/or observations of Availability of Standard Operating Procedure (SOP) for hazardous waste storage procedures.<br>b. The availability of temporary storage for B3 waste in accordance with applicable regulations.<br>c. Implementation of B3 waste identification, inventory, recording, and reporting<br>d. The amount and type of B3 waste.<br>Analysis Method: Qualitative descriptive analysis |
| 24. | Disease prevalence | Industrial Operations. | a. Manage the impact of declining ground water quality and quantity;<br>b. Manage the decline in soil quality; c. Manage the increase in air emissions; and d. Manage the decrease in ambient air quality.<br>c. Industrial waste water is routed to a wastewater treatment plant.<br>d. Temporary residential construction in the form of (temporary disposal) with 3R (Reuse Reduce Recycle) Waste in accordance with the provisions.<br>e. Develop Standard Operating Procedures (SOP) for the storage and handling of hazardous and toxic waste | a. Data collection methods include conducting observations, distributing questionnaires, and/or conducting interviews to learn about the disease patterns of the community surrounding the project site, labor disease patterns, and the number and types of environmental-based diseases that occur.<br>b. Method of Analysis: Qualitative descriptive analysis |

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