Addressing Poverty in Industrial Zones: An Agile Governance and Zoning-Based Approach

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Abstract: This study examines the socio-economic conditions in Jereweh and Maluk Districts, industrial regions associated with PT. Amman Mineral Nusa Tenggara, focusing on the economic disparities among various community groups. The research aims to analyze these gaps and propose context-specific policies and poverty alleviation programs. Grounded in Agile Governance theory, which emphasizes Responsiveness, Adaptability, Collectivity, and Innovativeness, the study employs a qualitative methodology. Informants include the Regional Government, PT. Amman Mineral Nusa Tenggara, local communities, and NGOs, selected through purposive sampling. Data collection methods encompass observation, interviews, and documentation, while data analysis involves reduction, presentation, and conclusion drawing, supported by NVivo 12 Plus software. The findings reveal significant economic disparities within the communities of Jereweh and Maluk Districts, particularly among economically disadvantaged groups who have not fully benefited from the industrial activities. This has exacerbated economic inequality in the region. To address these issues, the study introduces a novel approach that integrates Agile Governance with a zoning system. It offers actionable policy recommendations, such as enhancing access to information, providing skills training, facilitating access to capital for micro, small, and medium enterprises (MSMEs), and strengthening community participation in decision-making processes. Additionally, the study proposes innovative solutions like the sharing economy and crowdfunding to foster inclusive economic growth. The insights and recommendations from this research provide practical guidance for stakeholders and can serve as a model for addressing similar challenges in other industrial areas. By combining theoretical frameworks with actionable strategies, this study contributes to the broader discourse on reducing economic inequality and promoting sustainable development in resource-rich but economically divided regions.

Keywords: *Poverty; Agile Governance; Zoning System*

INTRODUCTION

There is a relationship between industrial areas and poverty (Zhong et al., 2024), where industrial areas can play a role in reducing poverty through several mechanisms, such as increasing economic growth, creating jobs, increasing income, and increasing access to infrastructure and public services (Zahra et al., 2022; Ringwald et al., 2023). However, paradoxically, industrial development can also have a negative impact on poverty, especially if it is not accompanied by appropriate policies (Rahman et al., 2022). This poverty problem is

generally related to the informal sector, low-paid workers, and lack of access to essential services such as education and health (Budiani et al., 2022).

There is no exception to the case of poverty in the industrial area of PT Amman Mineral Nusa Tenggara (AMNT). Based on 2022 data, the poverty rate around the industrial area (Jereweh and Maluk Districts) reached 13.02% or equivalent to 21 thousand people with different problems and needs in each District (NTB, 2023). Some of the factors causing poverty in the PT Amman Mineral Nusa Tenggara industrial area are as follows: low levels of education and skills of the workforce around the mine, limited job opportunities available around the mine, high cost of living around the mine, low welfare of the community around the mine, limited access of the community around the mine to resources and public services such as clean water, sanitation and health, and injustice in the distribution of profits between the company and the community around the mine (Idham Anhari, 2023; Wijimulawiani et al., 2023).

However, it must be acknowledged that each area in the Industrial Zone often has different problems (Del Rio et al., 2023; Feng et al., 2024; Boschma & Lambooy, 1999), including industrial areas that are experiencing changes or declines facing structural imbalances in terms of employment, infrastructure, and human resources, this can affect the ability of industrial areas to attract investment and create new jobs. Industrial areas are highly dependent on certain industries, so declining demand or policy changes can have a negative impact on employment and community income. More relevant skills in industrial areas need to be developed, which can affect the ability of local people to get decent jobs. In addition, environmental damage is also a serious concern in some industrial areas, especially if the previous industry was not environmentally friendly, which can affect the quality of life of local people and the potential for more sustainable industrial area development (Del Giudice et al., 2020; Yao et al., 2024; Radziszewska-Zielina et al., 2022; Ssekibaala & Kasule, 2023; Lestari et al., 2023).

Therefore, the use of the Zoning System becomes very relevant. The Zoning System can be used in poverty management to identify and address specific poverty issues in each industrial area (Elements, nd). Therefore, this study aims to use the Agile Governance approach based on the Zoning System in addressing poverty issues and differences in basic service needs in each industrial zone. This aims to ensure balanced economic growth, the availability of decent jobs, and adequate basic services for people living in the industrial area according to the needs and problems of each region.

Relevant poverty indicators in the context of industrial impacts, especially with the Zoning System approach, cover several essential aspects that reflect the socio-economic conditions of the community (Yao et al., 2024; Shahrabi-Farahani et al., 2024). Indicators such as household income, unemployment rates, access to critical services (education, health, clean water, and sanitation), and infrastructure quality highlight how industry benefits are not always evenly distributed (Llavero-Pasquina et al., 2024). In zones closer to industrial areas, improvements in community welfare are often more pronounced, while more remote zones tend to lag (Suprastiyo et al., 2023; Amruloh & Putri, 2023). The socio-economic gap between those with access to industrial opportunities and those without access remains a significant challenge. The Zoning System can help identify specific needs in each region and ensure that policies are more targeted and relevant. When combined with Agile Governance, which emphasizes responsiveness, adaptability, collectivity, and innovation, this approach can create more inclusive economic growth, provide decent jobs, and improve access to essential services according to local needs (Putra, 2020; Halim et al., 2021).
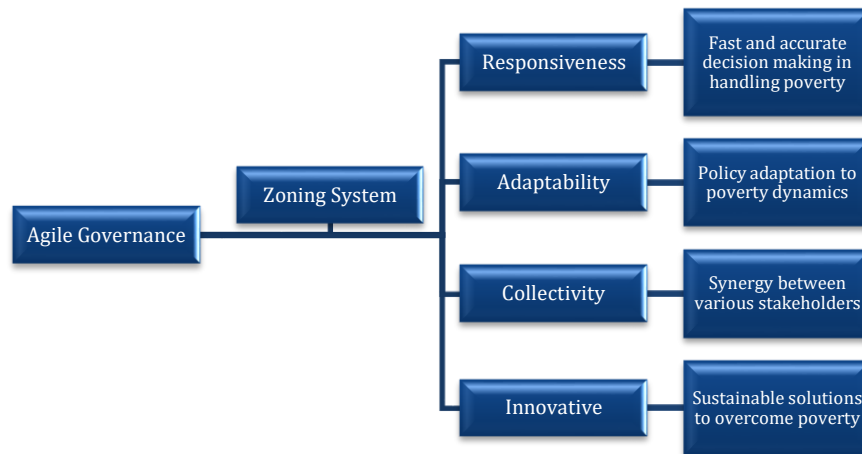
Figure 1. Research design
Source: Processed by the researcher, 2024

The image above illustrates the Agile Governance approach integrated with the Zoning System to address poverty, especially in industrial areas. Agile governance is a responsive, adaptive, collective, and innovative approach that enables more dynamic policies to address socio-economic challenges. In this context, four main elements are focused on: Responsiveness, Adaptability, Collectivity, and Innovation. The Responsiveness element highlights the importance of fast and accurate decision-making in addressing poverty. Using up-to-date data from the Zoning System, the government and stakeholders can respond to community needs in real-time, ensuring that the policies implemented are practical and relevant. Furthermore, adaptability shows the ability of policies to adapt to the dynamics of poverty in each zone. The Collectivity element emphasizes the importance of cross-sector collaboration. The synergy between government, companies, communities, and non-governmental organizations is key to the success of this approach. Finally, the Innovative element focuses on developing sustainable solutions that are short-term and provide long-term positive impacts. The approach depicted in this diagram shows how combining Agile Governance and the Zoning System can create inclusive and sustainable policies.

Previous studies have shown that industrial areas are often evaluated through household income, unemployment rates, and access to essential services, including education and health (Yao et al., 2024; Shahrabi-Farahani et al., 2024). However, these studies provide a general overview without considering the differences in conditions between zones within an industrial area. In addition, although (Llavero-Pasquina et al., 2024) discuss social and economic disparities in communities around the industry, their approach is less specific in offering zoning-based solutions that suit the needs of each region. This research gap lacks a holistic approach that integrates the Zoning System and Agile Governance in addressing poverty in industrial areas. Most previous studies have not considered the specific needs of each zone or adopted principles such as responsiveness, adaptability, collectivity, and innovation in policy strategies. This study seeks to fill this gap by proposing a more inclusive and adaptive approach while providing a zoning-based implementation strategy that can create sustainable impacts in addressing poverty in the PT AMNT industrial area.

RESEARCH METHOD

This study applied a descriptive qualitative approach focusing on poverty alleviation in industrial areas based on Agile Governance through a zoning system. This method was chosen because it can provide a deep and comprehensive understanding of complex socio-economic dynamics (Sugiyono, 2006; Mohajan, 2018). Through this approach, the study comprehensively explored individuals' and groups' motivations, perceptions, and experiences in the context of poverty policies in industrial areas. In addition, this method provided flexibility in adapting research questions to capture relevant nuances and details.

Primary data in this study were collected through face-to-face interviews with key informants, including representatives of the Regional Government, PT: Amman Mineral Nusa Tenggara, the community, and NGOs. Semi-structured interviews were used to explore various main themes, such as the socio-economic impacts of the industry, local employment challenges, the effectiveness of CSR programs, and government policies related to poverty alleviation. The informants were selected through purposive sampling techniques (Creswell, 2014), considering individuals who have in-depth and relevant knowledge of the issues being studied.

Secondary data in this study were obtained from various reliable sources, including policy documents, academic journals, institutional reports, and official industry and poverty policy publications. In addition, this study also utilized data from social media such as Twitter to identify public perceptions of PT. AMNT and the policies implemented. Validation was carried out through triangulation techniques to increase the reliability of data from social media by comparing information from digital platforms with official reports, interviews, and academic literature. The social media accounts analyzed were strictly selected based on their authenticity, using only verified or highly credible accounts (Sugiyono, 2015; Pratama et al., 2024; Drigas et al., 2020).

This study uses the zoning system as a spatial approach that divides industrial areas into several zones based on socio-economic characteristics, such as income levels, access to essential services, unemployment rates, and economic potential. The zoning system framework consists of three main stages: (1) identification and collection of socio-economic data from each zone, (2) comparative analysis between zones to identify specific needs, and (3) implementation of zoning-based policies that are adjusted to the conditions of each zone. The impact of zoning is evaluated through key indicators, such as increasing community income, decreasing unemployment rates, and increasing access to essential services.

This study also strengthened the zoning evaluation by incorporating spatial and geographic analysis. Spatial data was collected to map areas based on infrastructure access, population density, and distribution of essential services. Geographic analysis was used to understand the spatial relationship between industrial locations and their surrounding zones, allowing for a more comprehensive evaluation of zoning effectiveness. This study recommended collecting longitudinal data to assess the sustainability and long-term impact of zoning policies. This approach provided periodic monitoring of socio-economic changes in each zone, using key indicators such as household income, unemployment rates, access to essential services, and community perceptions of the policies implemented. With this approach, research can identify trends and patterns of change that may not be visible in a single-point study (cross-sectional). Longitudinal data also evaluated the effectiveness of zoning policies in reducing economic disparities and improving community welfare in industrial areas. The findings of this study were expected to provide more accurate, adaptive, and sustainable policy recommendations for zoning-based poverty alleviation in industrial areas.
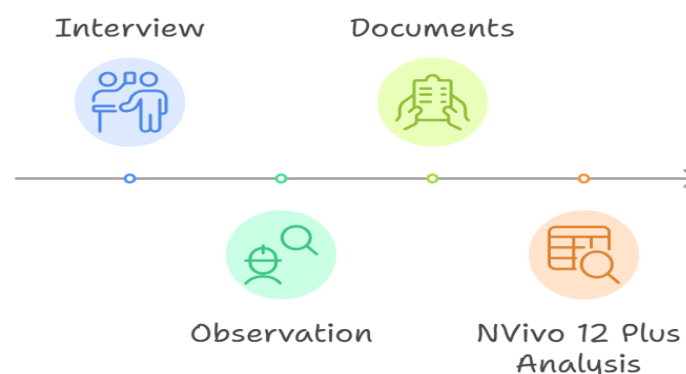

Figure 2. Methods of Data Collection and Data Analysis
Source: Processed by the researcher, 2024

Based on Figure 2 above, this study adopted a methodological approach that included in-depth interviews with various stakeholders, including representatives from the government sector, PT. Amman Mineral Nusa Tenggara, non-governmental organizations (NGOs), and local communities. These interviews were designed to explore key aspects, including the socio-economic impacts caused by the industry, local employment issues, the effectiveness of corporate social responsibility (CSR) programs, and government policies in poverty alleviation efforts.

In addition, this study also used a direct observation method to determine the conditions of the PT. Amman Mineral Nusa Tenggara industrial area. This observation aims to obtain a more holistic insight into handling poverty issues in the area.

At the secondary data collection stage, this study collected various documents related to poverty alleviation strategies and policies in the industrial area. The data collected was then analyzed descriptively and processed using NVivo 12 Plus software to support qualitative analysis. To enrich the study and identify potential gaps in the research, this study also utilized additional data sources obtained from Google Scholar.

The theory used in this study was agile governance, initiated by Luna, A. J. H. de O., Kruchten, P., and de Moura, H. P. (2015). It is based on a zoning system, so it views poverty management from a broader perspective.

This research was conducted in West Sumbawa Regency, focusing on Jereweh District and Maluk District. The selection of this research location was based on the consideration that both districts are located in an industrial area. Furthermore, these districts also recorded significant levels of poverty, which was one of the main reasons for choosing the research location (Wijimulawiani et al., 2023).

To obtain relevant discussions and conclusions, the author used NVivo 12 Plus software (Mortelmans, 2019) as an analysis tool. The selection of NVivo 12 Plus was based on several fundamental reasons, considering that this software is specifically designed for qualitative data analysis. NVivo 12 Plus allows researchers to explore, analyze, and understand data more efficiently. In addition, this device provided tools to present analysis results effectively, including the ability to create reports, diagrams, and graphs, as well as compile attractive presentations using the data that has been analyzed. These features facilitated communication and presentation of research results clearly and persuasively.

This study applied data collection analysis techniques that were divided into three stages: Data Import, Data Processing, and Data Categorization. The following process involved data observation and interview transcripts consisting of four stages: Data Categorization, Coding, Data Visualization, and Preview Results. The last stage included documentation divided into four steps: Coding, Data Analysis, Project map creation, and Data Visualization, combining concept maps and project maps. NVivo 12 Plus is the leading choice for qualitative researchers in data analysis with its various features and capabilities. These advantages make NVivo 12 Plus an effective and efficient tool for exploring and understanding qualitative data (Edwards et al., 2021; Nonci et al., 2023; Mohajan, 2018; Salahudin et al., 2020).

RESULTS AND DISCUSSION

The Agile Governance approach enables more dynamic poverty alleviation policies based on local needs. The concept of responsiveness is reflected in rapid decision-making based on zoning data. At the same time, adaptability is seen in the ability of policies to adjust to changing economic and social conditions in each zone. Collectivity highlights the importance of collaboration between government, industry, and society, while innovation is key to creating sustainable solutions. A new approach is integrating the zoning system and Agile Governance to ensure a more equitable and inclusive distribution of economic benefits in the PT. Amman Mineral Nusa Tenggara industrial area.

Alternative Policies for Addressing Poverty in Industrial Areas

The following are alternative policies that can overcome poverty in the industrial area of PT. Amman Mineral Nusa Tenggara, seen from the agile governance theory initiated by Luna, AJH de O., Kruchten, P., and de Moura, HP, then developed by researchers based on the zoning system to see poverty management from a broader perspective.

1. **Responsiveness**

The concept of responsiveness in the context of development and empowerment in industrial areas refers to the extent to which stakeholders, including the government, PT. AMNT and the community can quickly and effectively respond to local communities' needs and socio-economic problems. Based on the findings in this study, responsiveness is a crucial element in ensuring that development policies and programs can provide accurate and relevant impacts for the community, especially in dealing with the dynamics of change that occur due to industrialization. This can be seen based on the results of interviews with the Jereweh and Maluk District Communities as follows:

Figure 3. Interview with the Community of Jereweh and Maluk Districts
Source: Processed using Nvivo 12 Plus (2024)

From the picture above, the transition from PT can be explained in the case of Jereweh and Maluk Districts. NNT to PT. AMNT changed the socio-economic landscape, where some people experienced decreased purchasing power and access to social programs such as scholarships and job training. The inability of related parties to respond quickly to this change has caused the social gap to widen, especially among local workers who do not yet have the skills needed by the industry. Therefore, responsiveness not only includes the speed in dealing with emerging issues but also reflects the extent to which policies can adapt to the specific conditions in each zone in the industrial area. One main factor hindering responsiveness in industrial area management is weak stakeholder coordination. Local governments still have limitations in overseeing the implementation of corporate social responsibility and are less than optimal in designing inclusive policies based on local needs. In addition, the dominance of large companies in the industrial area economic ecosystem makes it difficult for small and medium enterprises (MSMEs) to develop because they do not get adequate support even though they have received training and assistance.

The low responsiveness in this aspect indicates the need for a more systematic mechanism to ensure that training programs, access to capital, and industrial benefit distribution policies can run more effectively and evenly.

The government and companies must be more proactive in utilizing the zoning system to identify specific problems in each region and adjust interventions based on local needs. In addition, strengthening technology-based information systems can accelerate data delivery and improve the decision-making process so that every policy implemented can be more responsive to the socio-economic dynamics. By increasing responsiveness in all aspects of development, it is hoped that the policies implemented can be more effective in overcoming social disparities, improving community welfare, and creating a more inclusive and sustainable industrial ecosystem.

2. Adaptability

Implementing more adaptive and zoning-based policies is a strategic step in ensuring a more proportional distribution of economic benefits in each industrial area, considering the differences in characteristics and socio-economic challenges. This approach allows the government and stakeholders to design more specific local needs-based interventions. This can be seen from the poverty conditions in Jereweh and Maluk Districts below:

Table 1. Poverty Conditions in Jereweh and Maluk Districts 2020-2022

Indicator	Jereweh District	Maluku Regency
Total population	10,244	14,642
Number of Poor People	1,384 (13.50%)	468 (13.67%)
Open Unemployment Rate	6.93%	5.50%
Average Income per Capita (Rp)	950,000	1,200,000
Number of Poor Households	421	873

Source: BPS, 2020-2022

Data shows that Jereweh and Maluk Districts are in the same industrial area, namely PT. AMNT, both face different poverty challenges, reflecting the unequal distribution of economic benefits from the presence of PT. AMNT. The percentage of poor people in Jereweh District was recorded at 13.50%, slightly lower than Maluk, which reached 13.67%. However, the difference in population between the two districts makes the impact of poverty in Jereweh more significant, mainly due to the high unemployment rate, which reached 6.93%, compared to 5.50% in Maluk. The high unemployment rate in Jereweh shows that local people still face limited access to decent jobs, so the mining industry's economic benefits are not evenly distributed.

Several factors, including differences in infrastructure availability, education levels of local workers, and access to economic empowerment programs, can cause this inequality—Maluk District, which has more excellent geographic proximity to the PT. AMNT Industrial Center tends to receive more financial benefits, including job opportunities and supporting infrastructure. Meanwhile, Jereweh, relatively more remote, faces limited access to these resources, making its people more vulnerable to poverty and unemployment. This imbalance indicates that economic growth generated by the industrial sector is not inclusive and is still centered on specific areas, without an even distribution of benefits throughout the industrial area.

To address this imbalance, the local government needs to increase Jereweh people's access to skills training programs, create jobs in alternative sectors other than mining, and strengthen economic infrastructure to encourage local MSMEs' growth. In addition, industrial companies also have a role in expanding corporate social responsibility programs to cover more expansive areas and provide a more even impact. With a more inclusive approach, socio-economic disparities between Maluk and Jereweh can be minimized so that industrial growth provides sustainable benefits to all people in the industrial area.

3. Collectivity

Collectivity in poverty alleviation in industrial areas emphasizes the importance of collaboration and synergy between various stakeholders, including local governments PT. AMNT, communities, academics, and civil society organizations. This collective approach aims to create more holistic policies and responsive to local needs by considering various perspectives and interests. Currently, community involvement in the policy process is still limited, with industry

and government dominating decision-making that often does not feel actual conditions on the ground.

Therefore, more inclusive and participation-based policies are key to creating more effective solutions to social and economic disparities in industrial areas.

One strategic step in strengthening collectivity is to build a systematic coordination mechanism between stakeholders. Local governments must initiate multi-party forums for open dialogue between industry, academics, and the community. This forum can be a forum for evaluating policies that have been implemented and designing more adaptive strategies based on feedback from the community. In addition, periodic policy evaluation is a must so that the policies implemented remain relevant to the ever-evolving socio-economic dynamics.

Collectivity-based policies also encourage innovation in poverty alleviation. One approach is crowdfunding as an alternative funding model to support education and community economic empowerment. By involving the community in collective financing, scholarship programs for children from low-income families can be expanded, while social assistance can be allocated more precisely. In addition, crowdfunding initiatives can also support skills training and business capital for local MSMEs, which contribute to increasing social and economic mobility.

Furthermore, collectivity can also be strengthened by building a more transparent and technology-based communication system. Utilizing online platforms to share information about empowerment programs, economic opportunities, and policies implemented can increase community participation in decision-making. Transparency in the distribution of resources and corporate CSR policies can also be monitored more effectively if the community has access to clear and easily accessible information.

Thus, collectivity in poverty alleviation policies in industrial areas focuses on collaboration between stakeholders and creating broader, more innovative, and local-needs-based participation mechanisms. By building inclusive and synergy-based policies, industrial areas can develop more sustainably, with more equitable economic benefits for all levels of society.

4. Innovative

Innovative approaches to poverty alleviation in industrial areas emphasize creative and adaptive solutions in facing various socio-economic challenges. One of the main strategies that can be applied is utilizing the sharing economy concept to strengthen the micro, small, and medium enterprises (MSMEs) sector. By developing an online platform that connects MSMEs with consumers and industry, market access for local products can be expanded, increasing the competitiveness of small businesses and creating a more inclusive and sustainable business ecosystem. In addition to increasing marketing reach, this platform can educate MSME actors on market trends, branding strategies, and the increasingly growing digitalization of businesses.

In addition, using crowdfunding as an alternative funding source has the potential to encourage the growth of innovative businesses that have difficulty accessing capital from traditional financial institutions. This approach can empower local communities to contribute to supporting community-based economic initiatives while creating financial independence for economically disadvantaged groups. In industrial areas, collective funding can be focused on work skills development programs, environmentally based entrepreneurial initiatives, and support for social businesses with broad economic and social impacts.

Furthermore, innovation in poverty alleviation must also include aspects of education and human resource development. Providing scholarships and social assistance for children from low-income families around industrial areas can be a strategic step to increase social mobility and create equal access to quality education. Thus, the younger generation in industrial areas has a more significant opportunity to improve their living standards in the future and contribute to regional economic development.

The successful implementation of this innovative policy requires support from various stakeholders, including local governments, industry, and local communities. The government needs to encourage regulations that support the development of the sharing economy, provide incentives for digital platforms that contribute to the empowerment of MSMEs, and oversee the implementation of scholarship and social assistance programs so that they are correct on target. Meanwhile, industry can play an active role in providing technological support and social investment, which allows innovation in poverty alleviation policies to run effectively and sustainably.

Integrating innovation-based solutions such as sharing economy crowdfunding and strengthening access to education will create inclusive economic growth in industrial areas. Through an approach oriented towards community empowerment and enhancing local capacity, this strategy is expected to sustainably reduce socio-economic inequality and improve the welfare of communities around industrial areas.

When compared with previous studies (Li & Zhou, 2024; Lippert & Sareen, 2023; Del Rio et al., 2023; Marshall et al., 2024; Feng et al., 2024), these findings are consistent with results showing that the presence of mining companies often brings significant economic benefits to surrounding areas, but these benefits are not evenly distributed. Previous studies have also noted that the industry's positive impacts are often offset by challenges such as social inequality and environmental degradation.

This study strengthens these findings with concrete examples from the Jereweh and Maluk Districts, where PT. AMNT plays a role in triggering economic growth and increasing inequality. For example, studies by (Tao et al., 2024; Koster et al., 2024; Thomas et al., 2024; Byaro et al., 2024) highlight the importance of fair and sustainable management in the extractive industry sector to ensure a more equitable distribution of benefits and minimize negative impacts.

In response to these challenges, this study proposes an Agile Governance approach based on the Zoning System to address economic disparities. This approach emphasizes responsiveness, adaptability, collectivity, and innovation, with strategies such as increasing access to information, skills training, facilitating access to capital for MSMEs, and innovative solutions such as the sharing economy and crowdfunding. This study provides concrete policy recommendations to strengthen collaboration between companies, governments, and communities to achieve a better balance in inclusive and sustainable economic development.

CONCLUSION

Poverty in the industrial areas of PT. Amman Mineral Nusa Tenggara, particularly in Jereweh and Maluk Districts, remains a persistent issue shaped by economic disparities, limited access to quality employment, and an unequal distribution of industrial benefits. This study highlighted the potential of the Agile Governance approach, implemented through a Zoning System, to enhance policy responsiveness, adaptability, and inclusivity. By identifying specific regional needs, the zoning-based approach enabled more targeted and effective interventions. Key recommendations include improving access to information, enhancing local workforce skills through training programs, strengthening MSMEs by facilitating access to capital, and leveraging innovative solutions such as the sharing economy and crowdfunding. While this approach offers a promising strategy for poverty alleviation, challenges remain, including weak stakeholder coordination, inadequate oversight of corporate social responsibility policies, and the dominance of large corporations in the local economy. To address these issues, the study emphasized the need for more participatory policymaking, stronger government involvement in monitoring industrial benefit distribution, and regulatory enhancements to support local economic sustainability. A governance model that is both adaptive and zoning-based has the potential to provide a more effective, long-term solution to poverty in industrial regions.

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