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Improving Mineral Mining License System in North Sumatera Indonesia

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Abstract:

The establishment of One-stop Service in Indonesia is expected to improve the quality of licensing process. In the mining license system, the investors still find some obstacles. Meanwhile the resources of mining area in Indonesia still attractive to the investors. Therefore, it is obvious that there is room for improvements in the mining license system. This research uses the Soft System Methodology. The primary data are obtained by interviewing the stakeholders and the secondary data are gathered through document review. The result shows that there are several problems in mining license system in North Sumatera. The problems occur because of the absence of local regulation in the mining license system, lack of coordination and unfit regulation. To improve the service in mining license system, the government need to issue a new regulation on mining license system, arrange a coordination system and issue new regulation on rock mining license.

Introduction

Indonesia continues to boost private investment to increase economic growth and reduce poverty. The World Bank researched the competitiveness ranking in Doing Business in 2018. Indonesia managed to step up to the position number 72 from 114 in 2015. However, the rank is still considered low compared with other ASEAN countries such as Singapore (2), Malaysia (24), Thailand (26), Brunei Darussalam (56), and Vietnam (68) (The World Bank, 2018).The Indonesian National Government issued policies to simplify the licensing process and to reduce the number of business regulations. The establishment of One-stop Service is one of the efforts to improve the licensing process at the provincial and regional/municipal government level. The idea of One-stop Service is to integrate the licensing process in the various departments into one office (The Asia Foundation, 2007). Despite the lack of private investment, the land-based investment appears to be one of Indonesia's most common investment options. In 1967–1998, the use of natural assets such as mining has been encouraged to boost financial development and growth (Casson et al, 2015). Before the establishment of One-stop Service, dealing with a license in Indonesia was complicated, high cost and inefficient. There are significant differences in processing times, costs, and requirements between these regulations and the related (locally implemented) laws (Steer, 2006).

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The issuing of Investment Law No 25 of 2007 on Investment changed the former process of investment in Indonesia by providing equal treatment to the investors. The law gives freedom to the investors to transfer and repatriate investment and profit, opens all business sector to the investment activity, provides fiscal and non-fiscal activities, and delivers better investment service to the investors by implementing One-stop Service. The law transformation has brought significant improvement in the Investment climate in Indonesia (The Swedish Trade & Invest Council, 2018). However, investors still find some obstacles in the license system in Indonesia. There are several obstacles in Mining business in Indonesia. Some of them are the difficulties in dealing with the downstream in-country processing requirement under the Mining law, lack of coordination between the central, provincial and regional/municipal governments, community relations and labor regulations (PwC Indonesia, 2017). The innovation in the license system not only regarding the service to the public but also in process beneath the system itself. In this context, the role of the different stakeholders involved in the process should be considered.

The mining sector in North Sumatera are quite promising, where the resources spreading in all regencies (Pemerintah Provinsi Sumatera Utara, 2017). Some of the area where the mining resources located are also overlapped with other sectors, such as Forestry, Plantation and river area. It is important to provide license system that is able to accommodate all the stakeholders. Furthermore, the lack of general operational procedure regarding the system also become a burden to the License Institution to perform more effective and efficient license system.

Roy & Tisdell (1996), found good policies, strong institutional structure and good governance are important to reach sustainable development. Many scholars found the principals of good governance in different sectors. Williams & Young (1994), formulated four characteristics of good governance: an efficient public service, accountable administration, a dependable judicial system and a balance between the government and the governed. Kaufmann et al. (2007), described the characteristics of good governance more broadly into six: voice and accountability, political stability and absence of violence, efficiency of government, quality of regulation, rule of law and control of corruption. In order to boost investment in a country Taylor, (2003), emphasized four elements of good governance to promote investment : Predictability, Accountability, Transparency and Participation. Furthermore, in the field of land administration Zakout et al. (2006), acknowledged eight keys of good governance : Efficiency, Effectiveness, Transparency, consistency and predictability, Integrity and accountability, Subsidiarity, autonomy and de-politicization, Civic engagement and public participation, Equity, fairness and impartiality and Legal security and rule of law. However, Zakout did not explain the elements of good governance on the license system for land-based investment, especially mining sector.

Therefore, the structuring of the problem characteristics is an essential step to develop an improved license system. The main objective of this study is to find clear strategies to improve Mining License system in North Sumatera Provincial Government Indonesia.

Literature Review

The term "good governance" was introduced by The World Bank in a report on sustainable growth in sub-Saharan Africa in 1989 (Doeveren, 2014). Kaufmann et al. (2007), reinterpreted the term of good governance as "traditions and institutions by which authority is exercised in a country".

Good governance is a theory that arranges some basic principles as a guidance for a government to run a Nation (Ekundayo, 2017). Good governance is distinguished by a high level of accountability, an independent judiciary, freedom of thought and speech and, above all, freedom of choice for its people (Rahman, 2016).

Policy is a comprehensive process from policy making to the implementation (Turner and Hulme in Keban, 2014). Public policy is the strategies from the government in response to public problems by utilizing available resources (Chandler & Plano, 1988). Public policy can be defined as four types : (1) regulatory, where the government regulate people behaviour, (2) redistributive, where the government redistribute existing wealth, or take wealth from the rich and give it to the poor, (3) distributive, where the government distribute or give the same access to the resources, (4) constituent, as a form of policy to protect the country (Keban, 2014). Shafritz et al. (2016), formulated the policy making process into a cycle. First, the government need an agenda setting to identify policy issues. The second step is to make a decision whether a policy is necessary or not. The third step is the implementation of the policy. The fourth step is to evaluate and analyze the policy.

One-stop Service in the world became well known in the 1980s to promote investment in a country. The institution is established so that the investor would only have to be in contact with one single entity to obtain all the essential documents in one efficient and synchronized process, rather than having to go through a complicated bureaucratic process (Stone, 2006). The introduction of One-stop Service also aims to increase the customer-orientation of public, to eliminate coordination gap among public organizations (Ongaro, 2004).

There are five stages in mining activity: Prospecting, exploration, development, exploitation and reclamation (Hartman & Mutmansky, 2002). According to The World Bank, there are five steps in achieving (Pemerintah Provinsi Sumatera Utara, 2017) sustainable extractive investment: (1) Policy, legal and contractual framework; (2) Sector Organization and Regulatory Institutions; (3) Fiscal Design and Administration; (4) Revenue Management and Distribution; (5) Sustainable Development Implementation. Investment in the extractive industry (EI) sectors (oil, gas, and mining) is the challenge to the policy makers (Cameron & Stanley, 2017).

Research Method

Location and Research time

Data gathering were conducted on 11th to 26th February 2019 in North Sumatera, Indonesia.

Methodology and Data Resources

The research was conducted using qualitative method including in-depth interviews of a selected panel of stakeholder about the focus of this research.

This research uses primary and secondary sources of data. The primary data is information obtained directly from interviewees, while the secondary data is acquired from reports, acts, regulations, articles, news and other documents.

The Stakeholders that are interviewed are investors who have experiences in investing in mining sector in North Sumatera (8), Officers in Provincial Government such as Officers in One Stop Service (3), Officers in Energy and Mineral Resources Department (2), Officers in Energy and Mineral Resources Department (2), Officer in Planning Agency (1), Officer in Spatial Planning and Housing (1), Officer in Water resources Management Department (1), Officer in Forestry Department (1) and Officers in Spatial Planning Department of North Sumatera Regencies (2) .

Data Analysis

The soft system methodology (SSM) method is used in this study. The licensing system is conducted by diverse stakeholders who have various and often conflicting strategies. The SSM method approach will be undertaken to take consideration of the involving stakeholders. The SSM will compare the existing conditions with the model conditions that should occur in the license system.

The SSM compares what is happening in the real world with different perceptions and develops supportable models that help make decisions or recommendations about how the problems are answered (Burge, 2015). The steps in Soft System methodology are explained in Figure 1.

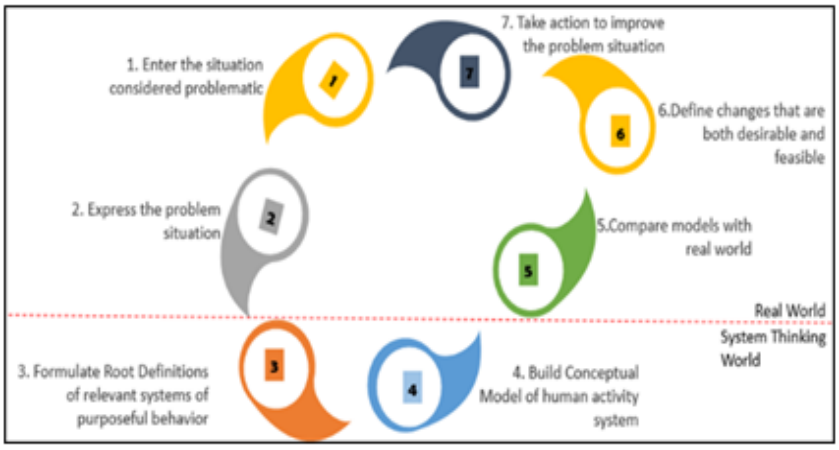
Result and Discussion

Review the Unstructured Problem

Based on the interviews with the investors and Government Officers, several obstacles are mentioned by the investors and the Government Officers. Both sides are facing problems in the system. The barriers in mining license system in North Sumatera can be grouped into five categories: time-consuming, uncertain, complicated, over-lapping, and uninformative.

The investors mentioned that the time-consuming problem happen when they have to go back and forth to the provincial and regional/municipal offices to deal with some documents . The idea of One-stop Service is to simplify licensing process, where the investors only visit one particular government office to deal with their license procedure (Stone, 2006). In the case of mining license system in North Sumatera, the investors still need to visit other offices to gain some documents as requirements for their license application. The One-stop Service Officers realize the problems. There are complaints from investors that they have to spend more time and money in mining license because they have to go to different offices to gain recommendation documents. In the license system in North Sumatera, each office has its procedure that is different from One-stop Service Office. There is no regulation from the provincial government that binds all the involving offices at the provincial and regional/ municipal government in the mining license system. The time-consuming problem takes places in the mining license system in North Sumatera because of the lack of coordination and no local regulations in the mining license system.

Uncertainty was also mentioned as a problem in mining license system in North Sumatera. Both investors and government



Source: Adapted from Burge, 2015

Figure 1. Steps in Soft System Methodology

officers pointed out the issue. There are confusions in dealing with spatial plan recommendation. The office that issues the documents are different in each region, and the requirement in obtaining the spatial plan recommendation is also not clear, either. The investors stated that they could not predict the completion time of recommendation papers from the regional/ municipal office and technical offices. The offices do not have a standard on how long the documents are issued. Even though there is a ministerial decree the national government that regulates the time completion of spatial plan recommendation, the regional/municipal government is not aware of the procedure (Kementerian Energi dan Sumber Daya Mineral Republik Indonesia, 2018). The government officers mentioned that sometimes there is no synchronization among the government offices, and this confuses investors. The lack of coordination among government levels has led to the problem. An officer mentioned that there are diverse procedures in each regional/municipal government in issuing spatial plan suitability recommendation. The investors will find it challenging to deal with spatial plan suitability recommendation if the rules are different at the regional/municipal government level. An officer stated that there should be other instruments for the provincial government to assess spatial plan suitability. The provincial spatial plan is not sufficient to assess that suitability since the scale of the provincial spatial plan is larger. The detailed spatial plan and regional spatial plan can be used to evaluate the suitability . However, the various processes at the regional/municipal level confuses the investors. The Ministry decree on mining guidelines does not explicitly mention which institution takes the authorization at each step of mining license. The absence of local regulation on mining license system keep the process in the grey area.

The government officers mentioned that the mining license system in North Sumatera is complicated. An officer stated that each office that involves in this system has its standard procedure, which sometimes brings difficulties to the One-stop Service Officers in uniting different perceptions. At the first stage of the system, an officer mentioned that the provincial spatial plan cannot be used as a reference to determine spatial suitability of mining activities, because the scale is not suitable. For example, 5 Hectare mining area does not appear in the provincial spatial map since the map scale of provincial spatial plan is $\geq$ 1: 250,000. Therefore, as an operational basis for activities, a detailed spatial plan with a scale of 1: 5,000 should be used. However, the various procedures in the regional/municipal government create complicated processes in the mining license system. The officer from the Spatial Planning, Water Resources, Human Settlements and Spatial Planning Office also mentioned that sometimes there are miss-matchings among a land title deed map, a spatial layout map and water basin recommendation, which confuse the investors. An officer indicated that the regulation is not quite suitable for the mining circumstances in North Sumatera. Most of the mining commodities in North Sumatera are rocks that have more simple mining activities compared with other commodities. The unfit regulation makes a complicated process for small-scale rock mining business.

The Overlapping process also occurs in the mining license system in North Sumatera. The problem takes place in all stages of the mining license. The field surveys that are conducted by different offices at the regional/municipal and provincial offices from stage 1 to 3. At the first stage, the field survey is conducted by three offices at separate occasions. The offices that conduct the field surveys

are the regional/municipalities offices that deal with spatial planning and the technical offices in the provincial government. At the second stage, the study is conducted by the Forestry Office if the mining area is located in the forest. At the third stage, the survey is conducted by the environmental office in the regional/municipal government to issue an environmental license as a requirement for mining production operation license. The mapping process that occurs in all stages is also found to be overlapping. The surveys also produce a map that to the investors are found to be overlapping. An officer mentioned that the different interpretation of technical regulations in the mining system causes the overlapping surveys. There is an overlapping process between mining production operation license and forest lease hold permit technical recommendation. An investor said that he was advised by the Energy and Mineral Resources Office at provincial level to acquire forest lease hold permits for both exploration and production operation license. The officer from forestry office said that it is not necessary to obtain different forest lease hold permit for the same location for small-scale rock mining business. He mentioned that the recommendation for forest lease hold permitfrom provincial government is sufficient for mining exploration. Forest lease hold permit is issued after Mining Operation Production is obtained by the investors.

The investors stated that it was difficult for them to find proper and valid information on the mining license process at the regional/municipal offices. The problem occurs at the first stage of the system. They also stated

that there is no information on the requirement and time completion in obtaining spatial plan suitability recommendation from the regional/ municipal office. An investor said that it is better for them to obtain information on the mining license system at the regional/ municipal office. Thus they do not have to visit the provincial office only to search for information.The Government officers acknowledged that it is difficult for investors to find proper and valid information on the mining license process at the regional/ municipal offices. The problem occurs at in stages of the system. The officers mentioned that it is essential to give information to the investors about the mining license system that accessible to the investors.

From the problems that were found in the mining license system in North

Tabel 1. Causes - Problems Matrix of Mining License System in North Sumatera

Stakeholders	**No local regulation on mining license**	**Lack of Coordination**	**Unfit Regulation**
Investors	Time-consuming	Complicated	Complicated
	Uncertain	Overlapping	
	Complicated	Uninformative	
	Overlapping		
	Uninformative		
Government Officers	Time-consuming	Time-consuming	Complicated
	Uncertain	Uncertain	
	Complicated	Overlapping	
	Overlapping	Uninformative	
	Uninformative		

Source : Author Analysis, 2019

Sumatera, it is crucial to formulate the causes of the problems. Based on the discussion on problems found in the overall process of mining license system in North Sumatera, several reasons trigger the issues. The problems happen because of the lack of coordination between the involving offices, no local regulations on mining license system, and the unfit regulation of mineral and coal mining regulation for rock commodity.

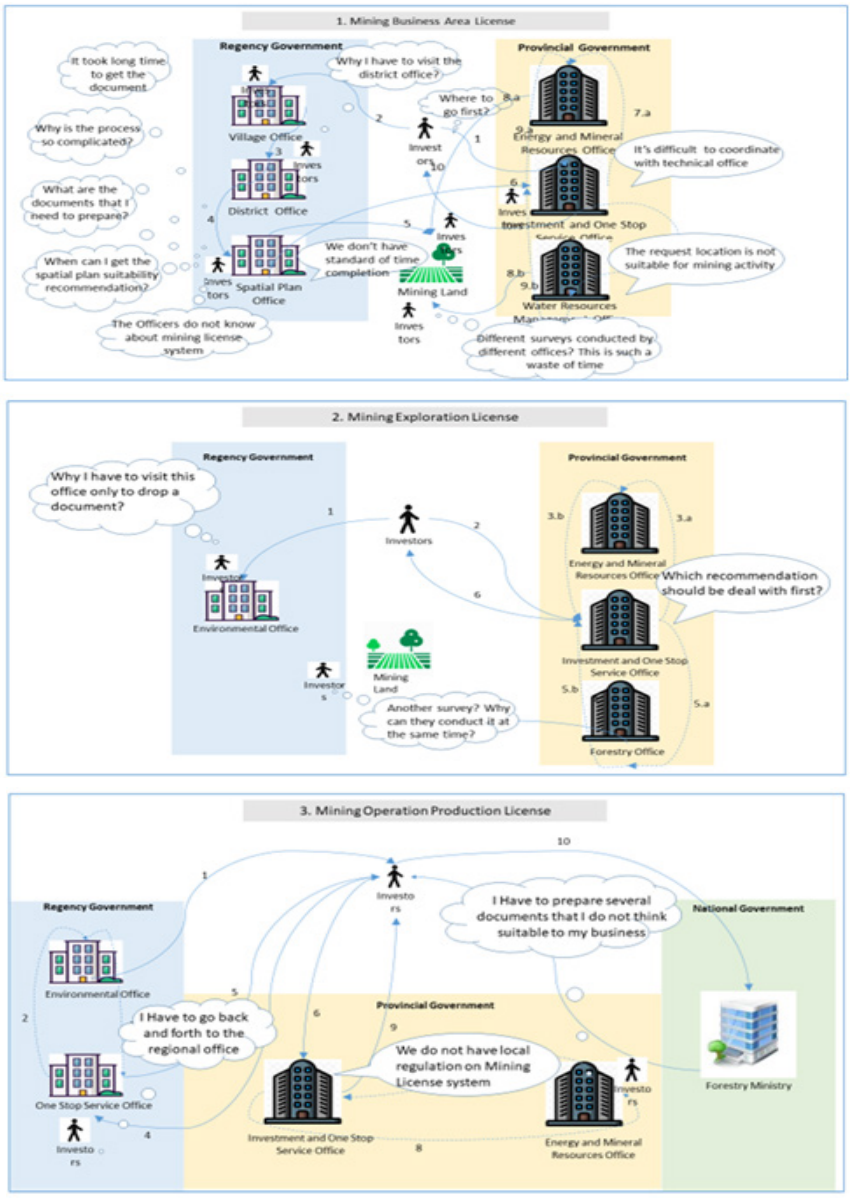
Express the Problem Situation

Based on the interviews, the problem situation can be explained in the Figure 2.

Root Definition

No local regulations on mining license.

Based on a rich picture that is showing the problematic situation and interview results, XYZ variable are formulated in Table 2. The CATWOE analysis for more detailed analysis can be formulated in Table 3.



Source: Author Analysis, 2019

Figure 2. Rich Picture of Mining License System in North Sumatera

Table 2. Root Definition 1

Variable	Description
X	Issue mining license based on existing local regulations
Y	Setting clear local regulation on mining license
Z	Deliver a fast, certain, simple, no overlapping and informative mining licensing system

Source : Author Analysis, 2019

Table 3. CATWOE Analysis for Root Definition 1

Variable	CATWOE Analysis
Customers	Investors
Actors	One-stop Service Office and Technical Offices
Transformation	No local regulations on mining license in North Sumatera --> existence of local regulations on mining license in North Sumatera
Worldview	Local regulations that can accommodate the entire licensing process
Owner	Provincial Government
Environment Constraints	Technical regulations and regencies policies

Source : Author Analysis, 2019

Table 4. Root Definition 2

Variable	Description
X	Conduct an integrated mining license
Y	Coordinating all the involve offices
Z	Deliver a fast, certain, simple, no overlapping and informative mining license system

Source : Author Analysis, 2019

The root definition statement: The system owned by Provincial Government (O) and operated by One-stop Service Office and technical offices (A) to issue mining license based on existing local regulations (X) by setting clear local regulation on mining license (Y) to investors (C) in order to deliver a fast, certain, simple, no overlapping and informative mining licensing system (Z) within the constrain of technical regulations and regencies policies (E).

Lack of Coordination

Based on a rich picture that is showing the problematic situation and interview results, XYZ variable are formulated in table 4. CATWOE analysis for more detailed analysis can be formulated in Table 5.

The root definition statement : The system owned by North Sumatera One-stop Service Office (O) and operated by Natural Resources License Division at North Sumatera One-stop Service Office (A) to conduct an integrated mining license (X) by coordinating all the involve offices (Y) to technical offices and regional/municipal governments (C) in order to deliver a fast, certain, simple, no overlapping and informative mining license system (Z) within the constrain of wide spread area (33 regencies and municipalities) (E).

Unfit Regulation

Based on a rich picture that is showing the problematic situation and interview results, PQR variable are formulated in Table 6. CATWOE analysis for more detailed analysis can be formulated in Table 7.

The root definition statement: The

system owned by Ministry of Energy and Mineral Resources at National Government (O) and operated by Directorate General of Mineral and Coal of Ministry of Energy and Mineral Resources at National Government (A) to manage regulations related to rock mining licensing (X) by Setting regulations that accommodate rock commodity type (Y) to investors and local government (Provincial and Regional/ municipal Government) (C) in order to deliver a simple mining license system (Z) within the constrain of Non-government Organization acceptance (E).

Build Conceptual Model

No local regulations on mining license

Local regulation at the provincial level is needed as guidelines to issue the license based on the situation at the North Sumatera Provincial Government. Mining license system in Indonesia is regulated by the Ministry of Energy and Mineral Resources at the national level. The Ministry issued regulations and guidelines on how to issue the mining license. However, other sector such as Forestry and water resources management also involve in the mining sector. The Ministry of Environmental and Forestry and Ministry of Public Works and

Table 5. CATWOE Analysis for Root Definition 2

Variable	CATWOE Analysis
Customers	Provincial Technical Offices and Regional/Municipal Governments
Actors	Natural Resources License Division at North Sumatera One-stop Service Office
Transformation	Lack of coordination on mining license in North Sumatera --> full of coordination on mining license in North Sumatera
Worldview	Licensing will be better if each office involved coordinated with each other
Owner	North Sumatera One Stop Service Office
Environment Constraints	Wide spread area (33 regencies and municipalities)

Source : Author Analysis, 2019

Table 6. Root Definition 3

Variable	Description
X	Manage regulations related to rock mining licensing
Y	Setting regulations that accommodate rock commodity type
Z	Deliver a simple mining license system

Source : Author Analysis, 2019

Table 7. CATWOE Analysis for Root Definition 3

Variable	CATWOE Analysis
Customers	Investors and Local Government (Provincial and Regional/municipal Government)
Actors	Directorate General of Mineral and Coal of Ministry of Energy and Mineral Resources at National Government
Transformation	Unfit regulation on mining license → new regulation on rock commodity mining license
Worldview	Regulation need to accommodate all the commodities
Owner	Ministry of Energy and Mineral Resources at National Government
Environment Constraints	Non-government Organization (NGOs) acceptance

Source : Author Analysis, 2019

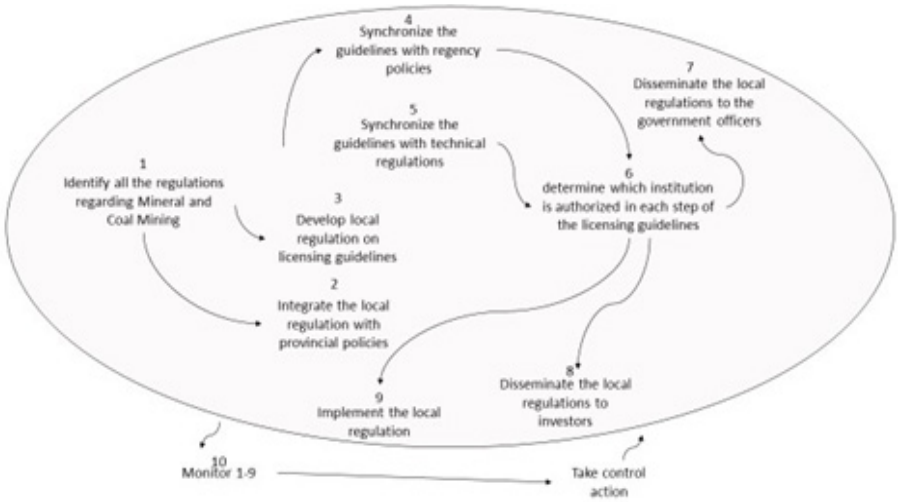
Housing produce regulations that are not in line with mining regulations. The officials at the One-stop Service Office mentioned that the local regulation is essential to bind every agency involved in it so that it can reduce the differences in perceptions. It is difficult for the One-stop Service Officers to manage the license without the local regulation. All CATWOE analyses to create a local regulation on Mining License system in North Sumatera are incorporated into a conceptual model as seen in Figure 3.

Lack of Coordination

Lack of coordination is one of the causes that mining license process is time-consuming, uncertain, complicated, overlapping and uninformative. Basically, all the problems are caused by the lack of coordination. All CATWOE analysis is incorporated into a conceptual model as can be seen in Figure 4.

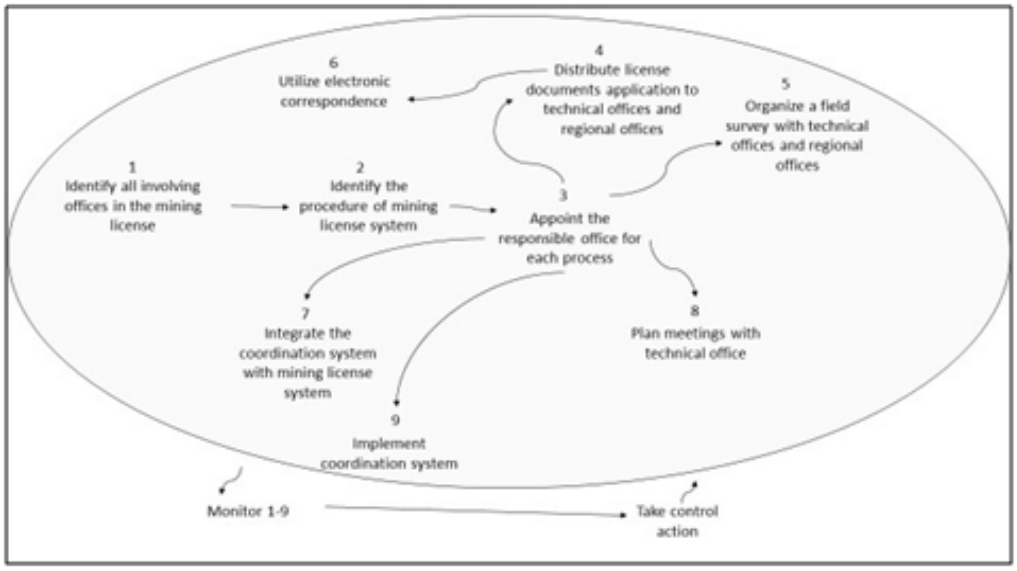
Unfit Regulation

Unfit Regulation is one of the causes



Source: Author Analysis, 2019

Figure 3. Conceptual Model 1 Local Regulations on Mining License System



Source: Author Analysis, 2019

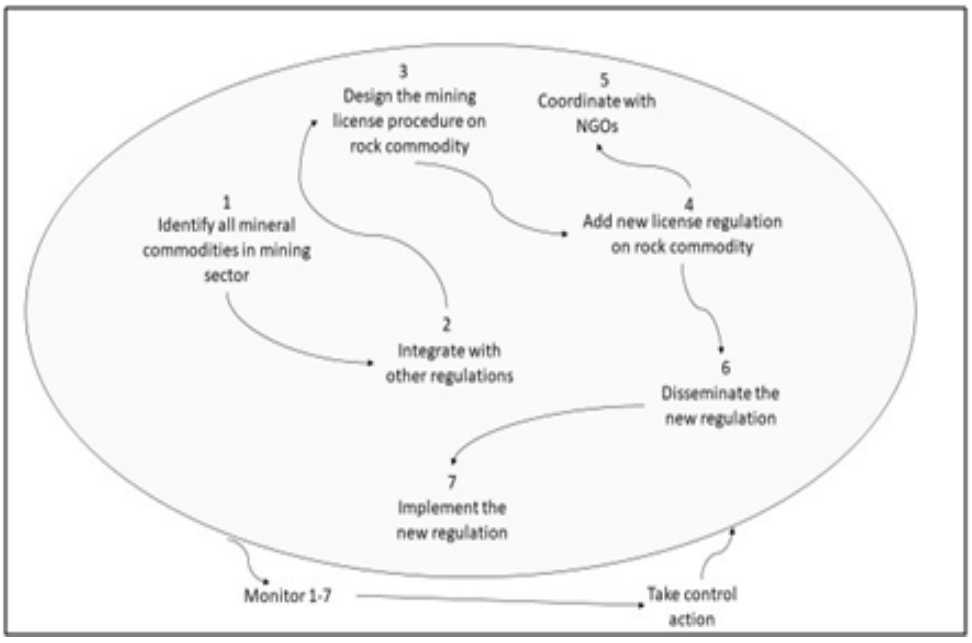
Figure 4. Conceptual Model 2 Coordination on Mining License System

regarding complicated license system in North Sumatera. The investors complained that the requirements for the mining sector are too complicated for them to fulfil. The investors found that the obligation to prepare various documents is not suitable to their business. The investors claimed that although they are running a small mining business, there is no differentiation of business scale in the regulations. The documents preparation required them to hire consultants that was quite expensive for them.

An officer at the Energy and Mineral Resources Office in the provincial government found that the problem occurs because of the unfit regulations of Mineral and Coal Mining. He mentioned that the regulation is not quite suitable to the mining circumstances in North Sumatera. Most of the mining commodities in North Sumatera are rocks. The rock mining is usually run by small scale business. He stated that the characteristics of mining commodities are different. Even if the law that regulates the licenses is the same, at least the Minister's Regulation must be distinguished. It is challenging for the small business to fulfill all the requirement that are the same as other valuable commodities. The rock mining is conducted by using semi-mechanical tools. They only need one or two days to conduct an exploration. According to the current regulation, the exploration needs to be completed before feasibility study. It is problematic for the investors because they have to conduct the exploration activities several times. The policies need to be taken to facilitate the investors to obtain the license in the shorter time.

Based on the current ministry decree, it is difficult to set up a new procedure only for rock mining commodity. In order to set up a new procedure, different ministry decree is required. That is why new regulation is needed to issue new regulations. All CATWOE analysis is incorporated into a conceptual model as can be seen in Figure 5.

The findings in this research in line with previous research. Based on the



Source: Author Analysis, 2019

Figure 5. Conceptual Model 3 New Regulation on Rock Mining Commodity

findings, both investors and government officers agreed that One-stop service need to be strengthen in order to achieve good quality in license service delivery. One-stop service need to be given authorization in managing the mining license system. The findings in line with the previous research, Roy and Tisdell (1996) emphasizes the importance of institution in good governance to gain sustainable development. Policy formulation is not enough to ensure effective implementation. A strong institution is need to be strengthen to gain an effective implementation.

Predictability is one of the elements in good governance that is important to promote investment. It is refers to clear policies and legal framework. Taylor (2003) mentioned that the clearer the application criteria, the higher the degree of predictability and the lower the investment risk. In North Sumatera mining license system, the investors mentioned that they need clear laws and regulations to get better prediction on their business scheme. Mimicopoulos (2007) mentioned that predictability is an elements of efficiency as a dimension of good governance. The author emphasized that the unpredictability in public policy or regulation will rise the risk factor in the business environment. Designing local regulation and regulation for rock mining will increase the predictability in mining license system.

Establishing coordination system will increase the accountability in mining license system. Based on the findings, the investors need to go back and forth to get information of mining license. Taylor (2003) mentioned that the accountability problem appeared when it is not clear who is in charge or taking decision. In order to ensure that the tasks are carried out properly, it is important to have consistent implementation requirements. Moreover, Mimicopoulos (2007) mentioned that accountability improves the legitimacy of the government.

Transparency also found as a challenge in The North Sumatera mining license system. The concept of transparency is based on the free flow and distribution of information. Institutional procedures and information should be provided easily available to the affected people and, in general, sufficient documentation should be provided in a comprehensible and controlled manner (Ekundayo 2017). In North Sumatera mining license system, both investors and government acknowledged the importance of transparency. The investors need it to develop confidence in doing business, meanwhile the government feel it important have clear guidance in taking decision. Cameron and Stanley (2017) acknowledged that transparency in the license process of extractive industries will decrease the discrepancy of information and skill that can arise between inexperienced officials in small governments and experienced investors.

Participation is important to ensure that the policies reflect development goals and stakeholders' interest (Taylor 2003). In current mining license system, the mining procedure are not suitable small scale rock mining business. It is important for the government to find strategies to build new regulation and procedure regarding rock mining. Furthermore, the government also need to coordinate with the NGOs to make sure that the new regulation will not harm both communities and natural resources.

Policy Recommendation

Based on the conceptual model, there are several recommendations for policy changes in the Mining License system in North Sumatera.

1. Integrate Mining Business Area with Spatial Plan.

   The provincial government needs to integrate the mining business area map with the spatial plan that contain spatial

pattern for mining area. The integration of those maps will make it easier for the technical team to decide whether an area is suitable for mining activity or not. It will also shorthorn the process time that will be beneficial for the investors. This policy can be derived by conceptual model 1.

2. Issue a new local regulation on mining license system.
   The Provincial Government needs to issue a regulation that binds all the involving office. The regulation will contain a standard operational procedure on mining license system since currently there is no regulation on procedure and requirements on mining license system in North Sumatera. This policy can be derived by conceptual model 1.
3. Publish the new local regulation to community and potential investors.
   The One-stop Service Office needs to provide information on mining license system at the regional/municipal government, on the website, and social media. Currently, it is difficult for investors to gain precise information on the mining license system. This policy can be derived by conceptual model 1.
4. Place the technical team at the One-stop Service Office.
   The technical team from the technical offices need to be stationed at the One-stop Service Office to give clear information and judgment on mining license process. The provincial government issued a decision letter on the technical team for the license in North Sumatera. However, the technical team members are not obligated to be stationed at the One-stop Service Office currently. This policy can be derived by conceptual model 2.
5. Utilize electronic correspondence to coordinate with technical office and regional/municipal governments.
   One-stop Service Office needs to utilize electronic communication to send required documents to technical offices and regional/municipal governments. Therefore, investors do not have to visit regional/municipal government offices to obtain the required materials. This policy can be derived by conceptual model 2.
6. Give access to the online license system for technical office and regional/municipal governments.
   By giving access to the online license system for the technical office and regional or municipal governments, the licensing process will be more manageable. Each institutions will have the responsibility of processing the license quickly and correctly. This policy can be derived by conceptual model 2.
7. One-stop Service manage the field survey. One-stop Service Office needs to be given authorization in leading the field survey by planning and conducting the study together with technical offices because field surveys are conducted by different Offices at different time currently. This policy can be derived by conceptual model 2.
8. Issue a new regulation on rock mining.
   The new rule on rock mining license system is essential and should be issued since the current regulation does not fit with rock mining business capability. The new regulation will contain the procedure and requirements of rock mining license. This policy can be derived by conceptual model 3.
9. Simplify the financial report requirement for small scale rock mining.
   In the new regulation on rock mining license system, it is crucial to eliminate the obligation to be audited by the public accountant for the small scale of the rock mining business. Currently, the investors have to prepare a

financial report that is audited by a public accountant to fulfil the financial requirement for Mining Exploration License. This policy can be derived by conceptual model 3.

10. Simplify the expert requirements for small scale rock mining.
    The obligation to hire an engineer needs to be eliminated. The small scale rock mining business does not need to hire an engineer. An experienced field supervisor would be sufficient. This policy can be derived by conceptual model 3.
11. Simplify the reports for small scale rock mining.
    In the new regulation on rock mining license, the exploration and feasibility study report on rock mining need to be simplified. Currently, the investors have to prepare a complicated exploration and feasibility study report. This policy can be derived by conceptual model 3.

Conclusion

Based on the study, several obstacles are found in the Mining License System in North Sumatera. The problems that are covering the whole process of license system in North Sumatera can be grouped into five categories: time-consuming, uncertain, complicated, overlapping and uninformative. It is essential to formulate the causes of the problems in the mining licensing scheme in North Sumatera. Based on the analysis of problems that are observed in North Sumatera's mining licensing process, the problems are caused by several factors. They are lack of coordination between the offices that involved, no local regulations on the scheme of mining licenses, and the unsuitable regulation of mineral and coal mining regulation for rock commodity. In order to improve the service in the mining license system, both provincial and national government need to apply clear strategies. The provincial government needs to issue a new regulation on mining license system and arrange a coordination system. The national government need to issue a new regulation on rock mining license.

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