Building Sustainable Mining Policy in Indonesia using Social Networks Analysis

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Abstract—**This study aims to look at the role of all actors involved in the transformation of mineral and coal ("mining") governance in Indonesia in order to build good public governance on mining sector. Considering, if the decentralization of mining policies in Indonesia is still as it is today, then the potential for natural resource curses will be difficult to avoid and increasingly apparent in the future. This study uses Social Networks Analysis (SNA) to see the relationships and forms that occur between actors in a network of mining policies in Indonesia (Law No. 4 of 2009). The results of the study show a strong influence of actors IUP(K) Production Operation in this mining policy. For this reason, it is necessary to improve mining governance at both the national and regional levels. The improvement of mining governance aims to provide a reference for the Government, Legislature, and Regional Government (provinces or districts / cities) in developing good mining governance; from granting business licenses to sustainable mining policies.**

Keywords—resource curse; sustainable mining policy; collaborative governance; social network analysis

I. INTRODUCTION

The new development paradigm leads to the occurrence of equity, growth, and sustainability in economic development. The new paradigm of decentralization development in Indonesia, refers to the second fundamental of economics welfare. This argument states that actually the government can choose the desired target of economic equality through transfers, taxation and subsidies, while the rest of the economy can be left to the market mechanism. Including the target of economic equality in the mining sector.

In Indonesia, the decentralization of mining which main purpose is to improve regional welfare through equity has not yet been achieved, even the number of economic disparities between regions is getting bigger [1]. If the decentralization of mining policies in Indonesia is still as it is today, the potential for natural resource curses will be difficult to avoid and more apparent in the future. History notes that the natural resource curse phenomenon has occurred in many countries. Nigeria is the most dramatic example [2,3]. The results of the study by Auty and Warhurst state: a favorable natural resource endowment may be less beneficial to countries at low and mid income levels of development than the conventional wisdom

might suppose that beneficial natural resources rewards less benefits for countries at low economic levels and medium than expected conventional wisdom [4]. Sachs and Warner conducted research in various countries by measuring the ratio of natural resource exports to GDP, finding that countries rich in natural resources tended to have relatively slow growth [5].

According to the study of Aragón-Correa *et al.*, on one side of abundant natural resources, it actually inhibits the development of institutional and democratic governance, which further impedes the prospect of economic growth [6]. This has caused a disruption of the role of the state, market and people. The curse of natural resources like this, now occurs in Venezuela as a country that is very rich in oil, but the condition of its people is in fact at the brink of collapse because its country is experiencing bankruptcy due to natural resources policies that are not managed properly [7]. With the above considerations, Indonesia needs to have a good mining policy management to support economic growth and equity in the era of regional autonomy. What about the current Indonesian mining policy?.

The significant of this study is to identify crucial actors who have different roles based on regulation of mining policies in Indonesia (Law No.4 of 2009). Hopefully, decision makers of mining policies in Indonesia may identify the actors who are giving dominance, influence, stand between two parties, or even unpredictable actors from outside of the mining system.

II. METHODS

Social Network Analysis (SNA) is a technique of studying patterns of human interaction [8]. Scott defines SNA as an analytical method for investigating aspects of social structures relations [9]. The outline of the SNA leads to the process of analyzing social networks related to the shape of the structure and patterns of interaction of the attributes in it [10]. Thus, the network pattern from the SNA analyst is a pattern of interaction between actors with one another in an activity. To analyze a social network, XL Node is used by using several dimensions of actors, links, ties, or connections in the analysis table of actor centrality in the network.

TABLE I.   THE ANALYSIS TABLE OF ACTOR CENTRALITY

	Definition
Degree centrality	The number of connections a node has. • In degree; node / actor has an important role. Many other actors try to get in touch with them. • Out degree; nodes / actors who have a very influential position in social networks because they are able to access other actors. This shows the ability of actors who can exchange information with other actors.
Closeness centrality	Closeness between individuals and other people in social networks.
In-between centrality	Measure how far the actor lies between other actors in the graph
Eigenvector centrality	Measure the importance of an actor in a network. This gives a relative score for all nodes in the network

III. RESULTS

As the reforms progressed, since the issuance of the Law on Regional Government Number 22 Year 1999, which was later amended into Law No. 32 of 2004, which was later amended into Law Number 23 Year 2014, it has given hope to wider regions to participate in various aspects development. This regulation gives some authority to the regions in the affairs of natural resources, even though in principle the responsibility for managing natural resources remains in the hands of the central government.

On the other hand, mining management arrangements have only been issued through Law Number 4 Year 2009 concerning mining. That is, since the reforms began in 1999 to 2009, the mining sector did not get clear regulatory guidelines.

Mining itself tends to be highlighted as a source of state revenue through tax revenues and non-tax state revenues. This cannot be denied considering that from year to year the contribution of state revenues from mining continues to increase significantly in the total state revenue of the Energy and Mineral Resources Sector in the State Budget. The important role of the mining subsector for national development includes: sources of state revenues, investments to encourage economic activities of the people and the national economy, energy sources for domestic needs, providers of raw materials for domestic industries, increased value-added mining, re-negotiation of mining contracts to provide greater benefits for the State.

The results of the Law of Mining Number 4 Year 2009 using Social Network Analysis with NodeXL data processing show (Figure 1).The biggest in degree in the mining policy is Government Regulations that are quite far from other values, which are followed by the Minister of Energy and Mineral Resources (Figure 2). The SNA results show that these two actors are most often accessed by other actors in policies related to mine governance.

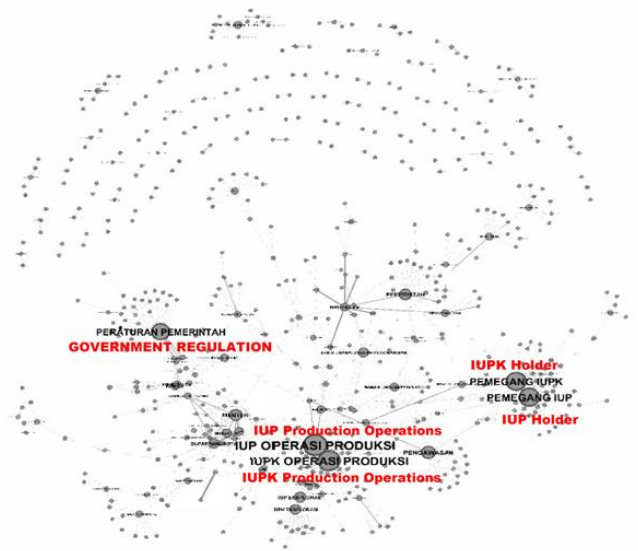Fig. 1. The results of the Law of Mining Number 4 Year 2009 using Social Network Analysis with NodeXL.

Fig. 2. In degree.

The biggest out degree is owned by: Mining Business Permit (IUP) Production Operations, Special Mining Business Permit (IUPK) Production Operations, IUP Holder and IUPK Holder. These four actors play an important role because they have the authority to access other actors in this mining regulation (Figure 3).
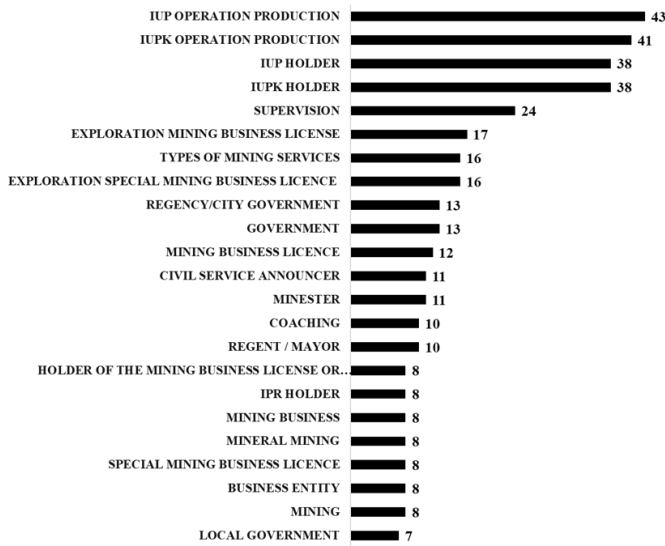
IUP OPERATION PRODUCTION | 43
IUPK OPERATION PRODUCTION | 41
IUP HOLDER | 38
IUPK HOLDER | 38
SUPERVISION | 24
EXPLORATION MINING BUSINESS LICENSE | 17
TYPES OF MINING SERVICES | 16
EXPLORATION SPECIAL MINING BUSINESS LICENCE | 16
REGENCY/CITY GOVERNMENT | 13
GOVERNMENT | 13
MINING BUSINESS LICENCE | 12
CIVIL SERVICE ANNOUNCER | 11
MINESTER | 11
COACHING | 10
REGENT / MAYOR | 10
HOLDER OF THE MINING BUSINESS LICENSE OR... | 8
IPR HOLDER | 8
MINING BUSINESS | 8
MINERAL MINING | 8
SPECIAL MINING BUSINESS LICENCE | 8
BUSINESS ENTITY | 8
MINING | 8
LOCAL GOVERNMENT | 7

Fig. 3. Out degree.

The highest in-betweeness centrality is IUP Production Operations. According to Marsden [11] and D'Andrea, Ferri, Grifoni [12], these actors can be the most dominant facilitators to bridge communication in the mining policy management (Figure 4).

IUP PRODUCTION OPERATIONS | 55365,093
IUPK HOLDER | 24938,503
GOVERNMENT REGULATIONS | 24910,492
MINESTER | 21819,882
IUP | 21610,534
TYPES OF MINING SERVICES | 21234,140
POST MINING | 19836,438
MINING | 19098,916
IUPK OPERATION PRODUCTION | 18872,624
RECLAMATION GUARANTEE FUND | 18555,070
SUPERVISION | 17157,988
GOVERNMENT | 17114,733
TAXPAYER | 16951,125
IUPK HOLDER OF OPERATION PRODUCTION | 15993,401
NON-TAX REVENUE | 14399,766
LOCAL GOVERNMENT | 14184,024
CONSULTATION | 13608,000
MINING BUSINESS | 13441,735
COACHING | 13102,000
REGENT / MAYOR | 12463,276
BUSINESS ENTITY | 12063,167
MINING BUSINESS ACTIVITIES | 10293,606
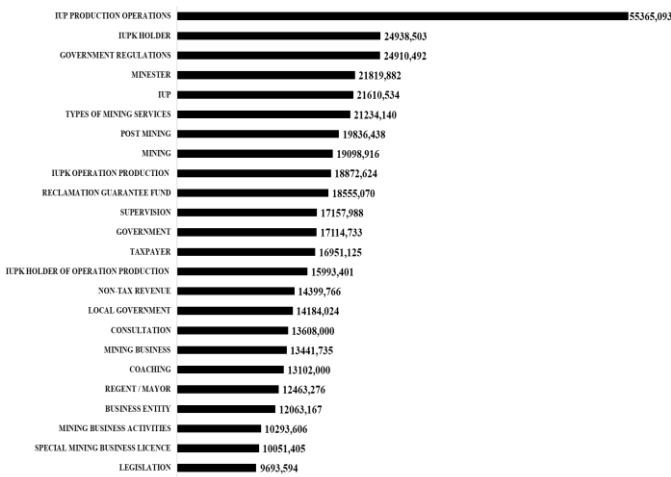SPECIAL MINING BUSINESS LICENCE | 10051,405
LEGISLATION | 9693,594

Fig. 4. Betweenness centrality.

The highest eigenvector centrality in mineral and coal governance policies is in (1) IUP Production Operations; (2) IUPK Production Operations. This means, these two actors are very important on all nodes in the network (Figure 5).
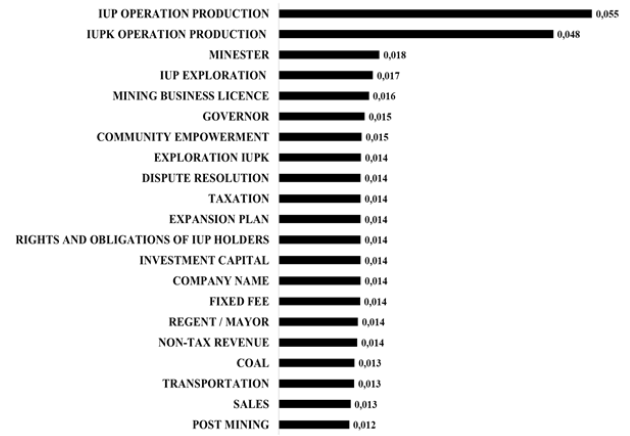
IUP OPERATION PRODUCTION | 0,055
IUPK OPERATION PRODUCTION | 0,048
MINESTER | 0,018
IUP EXPLORATION | 0,017
MINING BUSINESS LICENCE | 0,016
GOVERNOR | 0,015
COMMUNITY EMPOWERMENT | 0,015
EXPLORATION IUPK | 0,014
DISPUTE RESOLUTION | 0,014
TAXATION | 0,014
EXPANSION PLAN | 0,014
RIGHTS AND OBLIGATIONS OF IUP HOLDERS | 0,014
INVESTMENT CAPITAL | 0,014
COMPANY NAME | 0,014
FIXED FEE | 0,014
REGENT / MAYOR | 0,014
NON-TAX REVENUE | 0,014
COAL | 0,013
TRANSPORTATION | 0,013
SALES | 0,013
POST MINING | 0,012

Fig. 5. Eigenvector centrality.

IV. DISCUSSION

The data given above shows the strong influence of IUP and IUPK Production Operations actors in this mining policy. Referring to the Law No.4 of 2009, what is meant by "Production Operation" is the stage of mining business activities which includes construction, mining, processing, refining, including transportation and sales, as well as environmental impact control facilities in accordance with the results of the feasibility study. Even though it should, not only production operations must be dominant, but also the governance of mining activities outside of production operations which includes: (1) Licensing, (2) General Investigation; (3) Exploration, (4) Feasibility Studies (including analysis of environmental impacts), (5) post-mining activities (including reclamation), (6) community empowerment activities, including relationships with other stakeholders.

In relation to the enactment of Law Number 23 Year 2014 concerning Regional Government, it has been stipulated that the district / city government has no authority in government affairs in the mining sector. This is what causes legal and technical problems. Mining operations will be disrupted systematically. The issuance of Law Number 23 Year 2014 which revoked the authority to grant permits by regents / mayors and the authority was handed over to the governor gave birth to various issues concerning mining permits. Some of these problems, namely the existence of a legal principle which states that legislation that specifically overrides / overrides general regulations (*lex specialis derogat legi generalis*). According to this principle, Law Number 4 Year 2009 is a special regulation relating to the implementation of mineral mining. For this reason, all matters including mining permits are only guided by Law No. 4 of 2009. This opinion can be refuted if using the principle of *lex posteriori derogat legi inferiori* (the published rule later defeats the previous published rules).

In addition, to be able to apply the principle of *lex specialis derogat legi generalis*, in addition to having to meet the requirements for level rules (comparing fellow laws) must also be cognate (in the same field of regulation). Law Number 23

Year 2014 and Law Number 4 Year 2009 are considered as not allied. This difference of opinion affects the licensing process because it will cause potential legal disputes if there are parties who consider the authority to grant the permit illegal because it is not in accordance with Law Number 4 Year 2009 and Law Number 23 Year 2014. In this regard, the role of inclusive institutional strengthening is very important in developing sustainable mine governance policies [13].

V. CONCLUSION

The results of the Social Network Analysis with NodeXL data processing show that the Mining Law Number 4 Year 2009 is too technical and is dominated by discussions about IUP and IUPK Production Operations. Even though it should include discussion of: (1) Licensing, (2) General Investigation; (3) Exploration, (4) Feasibility Studies (including analysis of environmental impacts), (5) post-mining activities (including reclamation), (6) community empowerment activities, including relationships with other stakeholders.

In addition, it is necessary to synchronize regulations between Law Number 4 Year 2009 and Law Number 23 Year 2014 concerning Regional Government, specifically related to regional autonomy, in this case the importance of implementing decentralization.

Based on the foregoing, the revision to improve current Act (Law Number 4 Year 2009), is a necessity to provide a reference for the Government, Legislature and Regional Government (provinces or districts / cities) in developing good mining practices, both in terms of providing business licenses to sustainable mining policies so that resource curse can be avoided.

REFERENCES

[1] Warta Mineral and Batubara, Edisi X - Agustus 2011.

[2] P. Collier and J.W. Gunning, "Explaining African economic performance," Journal of economic literature, vol. 37, no. (1), pp. 64-111, 1999.

[3] G. Hawawini, V. Subramanian, and P. Verdin, "Is performance driven by industry-or firm-specific factors? A new look at the evidence," Strategic management journal, vol. 24, no. (1), pp. 1-16, 2003.

[4] R. Auty and A. Warhurst, "Sustainable development in mineral exporting economies," Resources Policy, vol. 19, no. (1), pp. 14-29, 1993.

[5] J.D. Sachs and A.M. Warner, "Natural resource abundance and economic growth (No. w5398)," National Bureau of Economic Research, 1995.

[6] J.A. Aragón-Correa, N. Hurtado-Torres, S. Sharma, and V.J. García-Morales, "Environmental strategy and performance in small firms: A resource-based perspective," Journal of environmental management, vol. 86, no. (1), pp. 88-103, 2008.

[7] https://www.bbc.com/news/world-latin-america-36319877.

[8] L.C. Freeman, "The development of social network analysis–with an emphasis on recent events," The SAGE handbook of social network analysis, vol. 21, no. (3), pp. 26-39, 2011.

[9] J. Scott, "Social network analysis," Sociology, vol. 22, no. (1), pp. 109-127, 1988.

[10] R. Fitriati, Membangun model kebijakan nasional keamanan siber dalam sistem pertahanan negara, dengan pendekatan soft systems methodology dan social network analysis. Jakarta: Universitas Pertahanan Indonesia. Jakarta: Universitas Pertahanan ISBN, 978-602, 2014.

[11] P.V. Marsden, "Egocentric and sociocentric measures of network centrality," Social networks, vol. 24, no. (4), pp. 407-422, 2002.

[12] A. D'Andrea, F. Ferri, and P. Grifoni, "An overview of methods for virtual social networks analysis," In Computational social network analysis. Springer, London, 2010, pp. 3-25.

[13] D. Acemoglu and J.A. Robinson, Why nations fail: The origins of power, prosperity, and poverty. Broadway Business, 2013.