
Principal-agent relationship in policy implementation of the use of forest area for mining activity, Indonesia

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Abstract: The use of forest area (UFA) is defined as utilization of a portion of forest land for any development purposes outside forestry without changing its function and designation. This study is aimed to explore the relationship of principal and agent in the UFA implementation. Based on the agency theory and using descriptive-qualitative methods, this study identified specific relationship characteristics, i.e. the lack of authority in agent selection, the domination of principal on information, the moral hazard behavior of both principal and agent, the higher risk assumed by the principal, and the poor implementation of incentive structure. The relationship patterns did not occur only between principal and agent, but also among different principals and between one agent and another especially in cooperation and conflict relationship. This study confirmed that better implementations of UFA are strongly influenced by the efficiency of contractual agreement, the principal control on the process of UFA implementation, the agent commitment on the agreed contract and the amount of transaction costs.

Keywords: The Use of Forest Area, Agency Theory, Principal, Agent

1. Introduction

Forest management and mining in forest resource management perspective and mine resources, has undergone a paradigm struggle due to strong demands of all parties to fulfill the needs of both the raw material resources of the community both local, national and international. Those fulfillment is related to environmental and economic issues which then leads to a difference in opinions when states allow some licenses/concessions of mining operations in forest areas [19].

The most obvious problem is deforestation and degradation due to activities of forest concessions, encroachment and conversion of land, while mining generally revolve around the issue of land and environmental degradation. Reference [13] state that deforestation in various simulation models which conducted by that the dominant stimulant of deforestation are logging activities and mining (large scale), and also potentially illegal activities.

To accommodate conflict interests of the management of natural resources, in particular between the interests of

management and utilization of forest resources from mining, the government has devised UFA policies. UFA is defined as the use of a portion of forest land for development purposes outside forestry without changing its function and designation (Regulation of the Minister of Forestry No. P.16/Menhut-II/2014).

UFA policies are set forth in the legislation, in the form of laws, regulations, President's instructions until ministerial regulations as implementation of technical regulations. In essence, those laws and regulations set operation of activities outside the forestry sector in the forest area in the mechanism of leasehold of the forest area license (LFAL). Up to now, the Ministry has issued a license to use forest land for mining activities as many as 1,025 units, with an area of 3,392,898.87 hectares¹.

Basically, LFAL is a principal-agent (PA) relationship as a form of authority (contract) forest management from the government as the principal (P) to the mining company as

¹ General Directorate of Planology, Ministry of Forestry. 2014. Progress of leasehold of the forest area license for mining activity until January 2014. Accessed at <http://www.dephut.go.id/index.php/news/details/9468> on March 15th 2014

an agent (A). With those LFAL allowed to use and utilize+ e energy and mineral resources in the forest area for both public inquiry, survey, exploration and exploitation (production operations). Contractual relationship between P and A is not always run smoothly, many problems occurred when implemented in the field as a result of policy imperfections. Some researchers argue that PA approach can be done in the realm of policy (Table 1).

Table 1. Some researchers arguments about the use of PA relationship in policy

No	References	Principal-agent in policy
1.	[1]	Principal-agent model is an analytical framework that is very useful in explaining incentives problem in the public institutions with two possible conditions, i.e,(1) there are several principals with each goals and interests are not coherent and (2) the principal can not act in accordance with public interest, but give priority to interests that are more narrow. PA framework is an approach to analyze commitment of public policy for the manufacture and implementation involves contractual issues relating to assymmetric information, moral hazard, bounded rationality, and adverse selection.
2.	[2]	Agency theory is able to explain the potential conflict of interest between the various interested parties.
3.	[10]	Principal-agent model can be used to explain the central problems in the interaction between the principal-agent in formulation and implementation of public policy related to the performance and service. Then the reciprocal relationship between the principal-agent on the policy cycle, from formulation to implementation of the policy and vice versa: 1) government as a principal to agent in the public service; 2) the society as a principal to political agent in various forms of government.
4.	[14]	

Agency theory is intended to solve two problems that can occur in agency relationships. First, the agency problem arises when: a) the desires or goals of the P and A opposite; and b) is a costly affair for P to verify what was actually done by A. Secondly, the problem of risk sharing arises when the P and A have different attitudes towards risk [22]. Agency theory focuses on the problem of asymmetric information, where the agent has more information about the actual performance, motivation, and goals, which could potentially create moral hazard and adverse selection. P itself must pay (costs) to monitor the performance of A and determine the structure of incentives and monitoring efficiency [20]

The purpose of this study was to analyze the implementation of UFA policy approach in relationship between the government (the principal) and the company of LFAL holders (agents) as well as identify problems and obstacles.

2. Method

This study used descriptive qualitative approach.

Qualitative approach look at reality as a result of reconstruction of researchers who are directly involved in social situations. One of fundamental characteristic of this research method is involvement and interaction of the researchers with the reality observed [24].

Data will be collected by the method of document review and regulation analysis, in-depth interviews with some experts and informants, and field observations at several mining companies having LFAL. Preferred observation form is unstructured observation that is carried out without using a guide. In this observation, the researcher must be able to develop the power of observation in observing an object and the object must master the science of research/observation [3]. The sampling was choosed using purposive and snowball sampling technique. However, approach methode conducted by [17] was used to know the transaction costs issued by the agent in UFA implementation.

Primary data were obtained from experts and informants of parties involved directly in the process of UFA implementation namely Ministry of Forestry, Provincial and District Forestry, District Department of Mines and Energy, Technical Implementation Unit in the center region, companies holding of LFAL and companies holding of the license of forest production utilization (LFPU). Secondary data was obtained from the documents and reports belong to companies as well as government agencies, books, magazines, newspapers or research reports and other relevant and reliable published sources.

Data collection was conducted in Bogor, Jakarta and several observation locations in Kutai Kartanegara regency of East Kalimantan, Tanah Bumbu regency of South Kalimantan, North Konawe regency and Kolaka of Southeast Sulawesi. Data and information collecting was conducted in 2006. Furthermore, field observation was carried out within Juli - December 2013.

3. Results and Discussion

Various issues in agency theory are described by [15] namely: moral hazard, adverse selection, asymmetric information, risk preferences, transaction costs, monitoring, incentives and contract design. While the issues or characteristics of PA relationship in UFA implementation are as follows:

3.1. Adverse Selection

Selection in PA relationship is an important early stage for the implementation and sustainability of the contract which will be agreed together. Selection of A determine the success of P in achieving goals or importances. However, in practice, P often made a mistake in choosing A (adverse selection). References [20 , 15] defined miscast as P mistake in identifying A expertise and inability of P to verify completely A capabilities before making decision to give authority to A.

In UFA implementation, A is a company that has

received mining exploitation permit from the central government (Minister of Energy and Mineral Resources) or from the local government (governor or regent). So the selection of A is in other sectors. P does not have the option of selecting A given authority to manage the forest. P accepts a mining company (as A) that asked LFAL if A has all the requirements.

Adverse selection has a huge impact on the contract implementation. Especially mismatch in contract implementation, P has responsibility and must struggle to achieve goals. Furthermore, P also should be able to eliminate the moral hazard that is done by A and alleviate costs in monitoring the implementation of the contract (monitoring costs).

Generally, the PA relationship is developed on the basic of needs of P that have the importances or the goals of the organization then gives trust to the other party (A) to conduct the work for achieving the goals or importances of P. While the PA relationship in UFA implementation is more on a request from A who have an importance or purpose to exploit mineral with P. Situations of PA relationship bring two (2) consequences, i.e. P does not have opportunity to choose and select A and A does not have opportunity or 'right' to reject the contract. The lack of choice for P has large impact on the performance of

institutions which formed during UFA implementation, especially on the fulfillment obligation of A during implementation of the contract.

3.2. Contractual Relationship

Agency problems triggered by difference of interest between the principal and agent. These problems can be eliminated by arranging an efficient contract to juxtapose P and A importances. The contract should be arranged by considering all aspects that can boost enhancement performance and reinforce A commitment to fulfill the goals of P. Contracts can also minimize the possibility of A deviating behavior in its performance. P always hoped A can fulfill its importances. While the failure in arranging contract would cause opportunistic attitude on A. Opportunistic attitude of A arises in form of neglect obligations and responsibilities or perform other illegal activities.

To resolve the agency problem, agency relationship theory identify and determine the choice between the two types of formal contract to control PA relationship, first is behavioral-based contract, and second is outcome-based contract.

Table 2. Comparison of characteristics of PA relationship in UFA implementation with contract based on the behavior and the final result.

No	Indicators that determining Principal-Agent Relationship	Behavior Based Contract*	Outcome Based Contract*	UFA's Contract**
1	<i>Asymmetric information</i>	Low	High	High
2	<i>Outcome Uncertainty</i>	High	Low	High
3	<i>Outcome Measurement</i>	Relatively Difficult	Relatively Easy	Relatively Easy
4	<i>Risk aversion</i>	High	Low	High
5	<i>Conflict of importance</i>	Low	High	High
6	<i>Incentive approach</i>	Principal and Agent have the view that the agent entitled to a reward	Principal give reward to Agent based productivity capabilities	Principal does not give any reward for the ability of agent productivity
7	<i>Transaction cost **</i>	-	-	Relatively High
8	<i>Moral hazard**</i>	-	-	Relatively High
9	<i>Contract implementing ** (contract implementation)</i>	-	-	Difficult

Sources:

* = Adapted from Rungtusanatham et al (2007)

** = Assessment is the result of researcher interpretation during the UFA policy implementation research and observation

When analyzing and comparing LFAL contract with indicators which proposed by [22], LFAL contract tend to avoid model of the second contract. The data show that P does not have capability to oversee A behavior, as well as the desired outcome is not as desired by P. An Assessment of A responses in implementation of the contract shows that almost all A obligation is not properly implemented according to LFAL contract. This condition is not as proposed by [23] where when P has the sufficiency to acquire and analyze information that is used to monitor agents behavior with efficient cost, then behavioral-based contract become an option.

According to [13], P can arrange contract where they can do a tactic or strategy to modify A behavior. To design an

efficient P-A relationship, the contract should be self-enforcing. That is, the contract can force or press selfishness in A to obey with what is expected of P. P must have at least four (4) ways to design an efficient contract and have self-enforcing to limit the possible fraud that will be done by A. First, P can be carefully filter the potential of A when they want to do agreement. Second, P can monitor A activities. Third, P can arrange the contract in which include provisions that may enhance P credibility and A commitment (rewards and punishment approach). Fourth, P can compare the performance between two or more A. If the design is appropriate, to compare how they can collect information about A behavior and also can prevent A behavior that would ruin his performance.

3.3. Asymmetric Information

Asymmetric information that occurs in the process of UFA implementation can be identified in two (2) cells of four (4) cells according to [26] were related with differences in goals between P and A. In the UFA implementation only identified B and C cells with different material information related to goal differences between P and A. If material information was based on P goal, then the mismatch relationship information such as cell C, where P control the information completely. Whereas if the material information is based on A goal, then the situation will be opposite to be B, where information is widely controlled by A. While A and D cells were not identified in this study. In various studies and literature, mismatch information B cell type were much found and discussed. Mismatch type such those information by [26] called as a 'classic case' (Fig. 1).

		A's Level Information	
		Little	Many
P's Level Information	Many	C	D
	Little	A	B

Figure 1. Quadrant of mismatch information related to the goal differences between P and A (adapted from Waterman and Meier 1998)

Differences goals between P and A which caused by differences goals generate the difference in material information that is had by both parties. That differences creates the existence of two types of mismatch information in the study of the UFA implementation. Types were referred as ' classic case ' in agency theory above refers to the goal to be achieved by A. P did not have any information, knowledge or experience about A goal, so P could not oversee activities related to mine production was done by A. so, P did not know A performance and very difficult to know whether A did deviation or not from the contract (moral hazard). In contrast, in the UFA implementation has a C cell type. Almost all information about forest management was the domain of the Ministry of Forestry as P. While LFAL holder companies hardly have such information. The absence of forest management information had by A cause a wide gap between P goal and A performance.

3.4. Lack of Incentives

Reference [18] stated that the amount of compensation received by A depends on the amount of profit generated in

accordance with the P contract agreement. Reference [4] argued that in countries with high levels of corruption, incentive mechanism greatly help to improve the motivation and worker performance. Base on both opinions, P should give incentives to A for successfully managing forests comparable with fruition of P. In the practice, the incentives were not applied.

Specifically, in the context of the UFA implementation incentives is an award or ease given by the government to LFAL holder for their performance in carrying out their obligations in accordance with their LFAL. The purpose of these incentives include: respect agent performance achievement, increase motivation and agents commitment, ensure fairness, maintain performance, and reduce risk of failure.

According to some officials in the Ministry of Forestry, non-tax government revenues (NTGV) through success reduction in the reclamation and revegetation was the incentive form for A. As for A, reduction in the NTGV was not attractive, especially with the discretion of the Director General of Planology about NTGV actually be a disincentive for A. A is more interested in legal certainty and continuity of their business in the forest area. On the other hand, the received of forest area which has reclaimed and revegetated did not guarantee A to get replacement area, because there has no regulations about it.

Incentives in the form of law certainty, area certainty and guarantee the continuity of the business as well as in other forms was expected by A, Therefore, P need to make restrictions or rules about incentives instrument in LFAL to increase motivation and commitment of A in doing the contract properly and accordance with P desire.

3.5. Risk Preferences

None of the people who want the risk to be assumed in relationship because it connotes to loss that should be accepted as result of taken decisions. In P-A relationship, the risk can certainly be felt by both parties. However, the agency theory both P and A will struggle to avoid the risk of implementation of the agreed contract. UFA implementation is essentially a risk management policy caused by other operational sectors in forest area. The most rational option, is giving other sectors chance to use forest as well in synergy with other sectors to restore forest condition.

Risk received (either by P or A) is the result of incomplete and weak supervision enforcement contract by P. The risk will be bigger assumed by P, especially in law consequence. The implementation of contract process was quite long, should provide an opportunity for P doing intensive supervision and continuous. Effectiveness factors and continuity of supervision become greatest challenge during implementation of the contract. If we follow the implementation process of the contract, the risks assumed by P was accumulation of A performance and result of the effectiveness and continuity of P supervision. The biggest risk will be assumed by P was the destruction of forest,

abandoned mine pits without reclamation and revegetation, so the purpose of forest recovery have failed.

3.6. Moral Hazard

In agency relationship, the two parties (P-A) will struggle to maximize their utility with the mutual benefit principle. However, because one party controls information better, will lead to opportunistic behavior of one party did not act for other party's importance. This situation caused the appearance of temptation for one or more persons to deviate in order to maximize [5, 8].

Opportunistic behavior performed by A to achieve the goals, reduce risk and transaction costs in implementation the contract. Lack of information that had about policies and regulations in forest management, it triggered A to do moral hazard. This behavior was supported by inability of P in controlling function and enforcement of A behavior. On the other hand, A precisely controlled the information, knowledge and experience techniques to achieve the same goal which was not owned by P.

Many cases that occurred in East Kalimantan and South Kalimantan is let the former mine that was not longer used. The holes of mine left open without reclamation and revegetation. Behavior without reclamation and revegetation or 'mine-and-run' would be the greatest risk for P if neglect LFAL contract allowed to happen.

Greater moral hazard was illegal mining caused by several factors, namely financial inability of A to fulfill the transaction costs for LFAL request, long permit bureaucracy, weak supervision and enforcement, market demand and mining commodity prices in the market as well as the strength backing of companies.

In the UFA implementation, moral hazard was not only done by A, but also by P. The collusion practice and gratification indicated in the UFA implementation process. Lack information of A was used by the person who becomes a free rider for profit. In LFAL submission process, A spent transaction costs between 7-15 billion. According [9] self-importanced behavior was not a moral issue. In the organization context, it was normal behavior because an opportunity to do so was available. However, it should be assessed whether it supports the implementation of the UFA policy actually towards forest destruction

3.7. Control

Control in the contract implementation of LFAL to be one thorny issue in the UFA implementation. To overcome the agency relationship problems between P and A, the required management control systems which is means to align goals between agent and principal [6]. Important aspects in control management systems there are existence a system and information exchange process, internal controls and audits, performance measurement and evaluation, compensation and incentive.

Although the contract in LFAL is based on combination of behavior and outcomes, but control is done by P toward

A performance tends to be based on behavior. However, these controls can not be implemented properly by P. Inability of P in control function becomes the cause of failure achieve that has been established. Budget and personnel resources constraints to be the reason for P performing control functions. Decentralization also has not implemented properly. Decentralization did not automatically result better forest resource management methods [18, 19]. Meanwhile, P could not simply rely on A commitment to carry out the contract properly, moreover A has not knowledge of forest management.

Low effort of A is the moral hazard problem in agency theory. Moral hazard problems may occur at the ex ante that is when LFAL submission and ex post at the time of contract execution, fulfillment the obligations, monitoring and control of post-mining results. In the stages of agency theory, the second problem was an error in A selection. A may not have the ability and P did not observe on A ability. Unknowing of P toward A ability requires P to control behavior of A tightly. In such situations the behavior-based control become the first option, although it occurred higher transaction as a logical consequence that must be accepted.

3.8. Principal-Agent Relationship Issues in the UFA Implementation

Agency theory gives attention to the settlement of two problems that can occur in agency relationship [15] A, was always positioned as party who tend to prioritize their importances rather than P importances. This tendency at last raises its own problems (agency problems). Agency theory that has developed is generally directed to solve any problems that may occur in agency relationship.

3.8.1. Principal-Agent Problems

PA relationship in the UFA implementation has different characteristics and problems with the PA in theory of its agency relationship in general. As an illustration to make it easier to compare different problems that occur in two types of PA relationship are summarized in the following table:

Table 3. Comparison of PA relationship problems in general with P-A relationship in the UFA implementation

Problem Identification	Principal-Agent Relationship	
	Generally	UFA implementation
Initiative	Principal	Agent
Agent Selection	Applied	Not Applied
Contract Formulating	Together (bargaining)	Principal (absolute)
Mastery of information	Agent	Principal
Moral Hazard	Agent	Principal and Agent
Incentives application	Applied	Not Applied
Control	Strong	Weak
Risk Distribution	Principal	Principal

3.8.2. Principal-Principal Problems

Recent studies show that P-P problem can occur in an institution if there is a mismatch goals between P in that institutions [25]. In particular, it will happen because of difference importances between big P (superior) and small P (inferior). Previous studies examined the problem of P-P have solid foundation of economic problems which the majority of P doing conspiracy with the company's owner to take over the resources / assets of the company [12].

In the context of the UFA implementation, P-P relationship was due to the two delegation of authority to the LFAL holder that were the Ministry of Forestry (P-for) and the Ministry of Energy and Mineral Resources or Regent (P-mine). Reference [11] defined the P-P problem as a conflict between two individuals or groups P, big P as the party that controls and small P as controlled. [25] developed the definition by stating that the problem of P-P refers to the adjustment of the value of small P becomes P big, it often affects decisions such as asset sales and purchases. While in this study, the P-P problem is defined as a relationship between two or more P who gave delegates to the A to achieve the goals of each level of P. P can be parallel or there are different levels, both positions in government, politics, economics, social and culture.

The existence of more than one P by [16] referred to as multiple principals. Each P delegate accordance with their authority. P should solve internal problems between them then collectively (collective principal) motivate A to improve their performance to fulfill P importance. The establishment of collective principal will make it easier for A to implement contract that has been formulated. However, the collective principal in the UFA implementation is difficult to formed due to lack of coordination both P.

The fundamental problem that arises between P-for and

P-mine is the difference importance in natural resource management. Until now there is unavailable policy or rule that can bridge two importances. These conditions make the forestry sector's bargaining position is very weak in determining policy the existence of mining in forest area. The forestry sector is almost always defeated by other sectors with the reason of national importance and economic growth.

3.8.3. Agent-Agent Problems

AA problem also identified in the UFA implementation. P-for having 2A, that were mining company as LFAL holder (A-mine) and forestry company as LFPU holder (A-for). Problems appear as a result of the P-for giving LFAL area to A-mine overlapping with LFPU concessions given to A-for. Conflict between A-mine and A-for still occur both in the domain of administration, coordination and in the field. Some problems between A-mine and A-for resolved with business to business (B to B). Most other cases are forced to be reported to the P-for.

In general, the conflict appears because A-for does not agree with A-mine activities considered disruptive the preservation of A-for forests status. The other reason, there is no agreement on stands compensation and infrastructure that has been built. While A-mine feel has had LFAL lawful to perform activities in forest areas that have been set. A-mine also complains to irrational demands of stands compensation and infrastructure of A-for. In situations of unresolved conflict, identified that A-for trying to do rent seeking/opportunistic behavior in conflict. As a result, transaction costs of A-mine are rising. Some advanced problems due to overlapping licenses in the same area is unclear boundaries of forest management authority, the opening access to the LFPU territory belonging to the A-for uncontrolled.

Table 4. Some cases A-for and A-mine conflicts in forest area

No	A-for	A-mine	Conflict Matter	Resolution	Progress
1.	Intracawood Manufacturing PT	Jelai Cahaya Mineral, PT	Forest area management problem	Mediation by Ministry of Forestry	Unfinished
2.	Adindo Hutani Lestari, PT	Pipit Mutiara Jaya, PT	Forest area management problem and compensation fee	Mediation by Ministry of Forestry	Unfinished
3.	ITCI Hutani Manungga, PT	Gunungbayan Pratamacoal, PT	Forest area management problem and compensation	Mediation by Ministry of Forestry	Unfinished
4.	Kirana Chatulistiwa, PT	Anugerah Daya Gemilang, PT	Compensation fee	Business to Business	Finished/Clear
5	Karda Traders, PT Amprah Mitra Jaya, PT. and Sari Bumi Kusuma, PT	Kapuas Prima Coal, PT	Compensation fee	Business to Business	Finished/Clear

As a brief overview of PA relationship problem in the study of UFA policy implementation were identified as

quadrant in Fig. 2.

		Forestry	
		Principal (P-for)	Agent (A-for)
Mining	Principal (P-mine)	<ul style="list-style-type: none"> - Differences motivation and natural resource management objectives (self-importance conflict) - Lack of coordination between sectors, and between central and regional - The exchange of information is limited - <i>Bargaining position (Politic, Power)</i> 	Unidentified
	Agent (A-mine)	<ul style="list-style-type: none"> <i>Adverse Selection</i> <i>Moral hazard</i> P's Lack of Control A's low commitment <i>Transaction Cost A</i> The absence of incentives 	<ul style="list-style-type: none"> - Interrupting forest governance performance of A-for - Unclear boundary management authority <i>Compensation cost</i> - The lack of coordination and cooperation <i>Moral hazard (rent seeking, opportunistic behavior) A-for</i> <i>High transaction cost to A-mine</i> <i>Forestland access</i>

Figure 2. Quadrant of P-A relationship variations and problem identification.

3.8.4. Transaction Cost

In the UFA implementation process, A can not be separated from cost consequences, start from information retrieval, LFAL submission, implement their rights and obligations (contract). Transaction costs in the UFA implementation context is a cost to be assumed by P and A as implementation result of the agreed contract. Transaction costs include the obtaining cost up to the LFAL publication (contract), implementation of contract along with other costs as a result of the contract implementation and contract settlement costs. As an illustration of the estimated transaction costs issued by A is as follows:

Table 5. Transaction cost of agent in the UFA implementation

No	Type	Transaction Cost (Rp)
1.	Submission of LFAL application	7 billion
2.	Conflict resolution	≥ 8 billion
3.	Non Taxes Government Revenue	1,76 billion/year
4.	Agreement with the LFPU holder	66,5 billion/year

Some characteristics of agency theory in the UFA implementation that studied conical on four important factors that affect A performance in implement contract as detailed in LFAL. Five supporting factors are effective contract, high commitment from both parties, strict control of P to A performance, low transaction costs and appropriate incentive for A.

4. Conclusion

PA relationship in the UFA implementation had distinctive characteristics. The initiative relationship comes from A, there was no Agent's election, P mastering more information, moral hazard was done by both parties, and there has been no incentive. Agency relationship identified not only PA relationship happened, but also the relationship of PP (P-for and P-mine) and the relationship of AA (A-for

and A-mine) in cooperation and conflict form. Conflict relationship between P-for and P-mine caused by differences goals and motivation in resource management and lack of coordination. While the conflict relationship between A-for and A-mine caused by overlapping licenses in the same forest area.

PA relationship in the UFA implementation could walk better if there were at least five supporting factors, namely; effective contract, high commitment from both sides, strict controls, low transaction costs and appropriate incentive

In general, agency theory was a simple analytical tool and relatively applied easier to unravel the problems of principal-agent relationship in public policy. The use of agency theory in the study of public policy make it easier to analyze the relationship, roles, responsibilities, behaviors, risks and prediction results (outcomes) to be obtained. Thus, in the public policy of implementation process, the principal had the opportunity to do remediation efforts on policies to improve performance of the institution.

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