

Effectiveness of Supervision of Spatial Planning Policies in the Karangasambung Geological Preserve Area

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Abstract. The Karangasambung Geological Preserve area (KCAGK) is an area that has unique rocks and fossils, so it is nicknamed the "Black Box" process of the universe. Spatial policy in the form of a national, provincial and district Spatial Plan (RTRW) which establishes as a strategic area from the interests of environmental carrying capacity, as a consequence it is prohibited from all activities that change geological formation. Illegal mining activities are still a threat to the loss of protected rock diversity. The development of the industrial revolution era 4.0 has brought consequences and demands for increased accountability, transparency in public services by the government, thus bringing a paradigm shift and the role of supervision of spatial planning policies. This research will focus on aspects of supervision that are reviewed from the institutions and participation of the community. The study was carried out at the KCAGK location in Kebumen Regency, using quantitative methods through the information target was the community represented by village officials, community leaders and miners, while the institutions consisted of LIPI (Indonesian Institute of Science) and local government.

Keywords: RTRW Policy; Effectiveness; Supervision; Geological Preserve Area; Community; institutional

1 Introduction

Regional development is an embodiment in creating economic growth that has an impact on the welfare of society, but economic growth seems to be the main goal and heed the impact and sustainability. Conditions in the late 80s, where the environment had not been considered a priority in economic and social growth. These conditions changed in 1987 when the paper on the Brundtland report "Our shared future" and the emergence of the concept of sustainable development [1]. Development that can fulfill the current generation without reducing future generations is defined as sustainable development [2].

In realizing sustainable development, we are confronted with sectoral conflicts, namely: social, economic and environmental. The existence of social, economic and ecological sectoral interactions will lead to land-use conflicts in a particular location [3]. The environmental problem in sustainable development is triggered by economic interests that are considered a priority, so that material welfare is the main thing especially in favor of large investors. Whereas the environment is seen as a less important need so that it will lead to exploitative ways of utilizing existing natural resources.

The interests of the space each have sectoral goals, including: 1) Social interest, with the aim of improving quality of life, welfare and empowerment, 2) Economic

interests, goals are growth, equity, economic stability, and efficiency and 3) Environmental interests, objectives carrying capacity and environmental capacity for nature conservation. The spatial planning policy in the form of a regional spatial plan is expected to become a reference, a direction for development, this is in accordance with Law Number 26 of 2007 concerning Spatial Planning.

The legal product of spatial planning is a policy set forth in the form of legislation nationally and regionally [4]. The understanding of the spatial plan in the implementation process is carried out continuously, meaning that the monitoring or evaluation process, evaluation and review of spatial plans are important in creating sustainable effectiveness and planning [5]. Today's environmental protection challenges in addition to fulfilling spatial planning policies require implementation that must synergize with technological advances, where almost all sectors are aware of the era of 4.0 which integrates physical, digital and biological conditions so that it will fundamentally change lifestyles and social interactions [6]. Karangasambung area, which is a meeting of the Indo-Australian plate with the Continent Asia plate, is an area that has been designated as a Geological Reserve Area. One of the provisions is through the National, Provincial and Kebumen Regional Spatial Planning policies. Areas that should be sterile from rock mining activities, but the reality in the field is often found in these activities. This condition will have

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an impact on the reduction and even loss of geodiversity at KCAGK.

1.2 Formulation of the problem

In facing challenges in the industrial era 4.0 it is necessary to immediately address the existing pattern of change, while spatial planning policies still face many obstacles. In its mandate, the RTRW must protect KCAGK from geodiversity extinction, but it is still weak at the supervision stage, marked by the existence of rock and sand mining activities that can change geological formation and damage the environment.

1.3 Research question

What factors have caused the effectiveness of the RTRW policy supervision to be seen from the institutional aspects and community involvement in Geological Preserve Area?

1.4 Goal research

Identifying the effectiveness of institutional roles and the risks involved in overseeing the RTRW policy in Geological Preserve Area.

1.5. Hypothesis (optional)

There are factors that cause the oversight aspect of the RTRW at KCAGK to be weak, in terms of the institution and role of the community. Institutional aspects have a significant relationship to 1) task authority, 2) coordination between institutions, 3) funding and 4) human resources. Whereas from the role of the community are: 1) ignorance of the RTRW policy, 2) lack of socialization, 3) environmental indifference and 4) lack of place in supervision involvement.

2 Literature Review

2.1 Spatial plan based on environmental carrying capacity

Spatial planning based on environmental sustainability is an effort to realize a balance of natural resources and a sustainable environment [7]. Whereas the understanding of the carrying capacity of the environment is the ability of the environment to support the lives of humans and other living beings and the balance between the two.

2.2 The implementation of Spatial Planning

The implementation of Spatial Planning basically includes 4 (four) important contents, among them: 1) Arrangement of Spatial Planning, 2) Development of Spatial Planning, 3) Spatial Planning Implementation and 4) Spatial Planning Supervision. The following is the process of organizing spatial planning in each process.

2.3 Monitoring spatial plans in maintaining sustainability

Monitoring regional spatial plans has been considered as an increasingly important factor in the implementation of the learning plan and process, besides monitoring spatial plans is fundamental in the planning process, useful in whether the plans are in line with objectives and ensuring sustainable development [8].

2.4 Geopark concept as protection against KCAG

The definition of Geological Reserve Area is part of a geological protected area that has unique rocks, fossils, and landscapes. The uniqueness of rocks and fossils functions for natural laboratories, past life traces, anthropological and archaeological values and historical traces of geological structures [9].

The concept of geopark is an integrated unity that will 1) conservation, 2) education and 3) sustainable development, while this concept is considered an approach in promoting geological conservation according to McKeever [10]. Three main aspects of supporting the concept of Geopark include: 1) conservation of rock heritage, 2) economic development, and 3) community participation [11].

2.5 Effectiveness of Policy Supervision

Understanding effectiveness is a measure that states the achievement of targets in quantity, quality and time, a high level of effectiveness is indicated by the large percentage of targets achieved according to Hidayat in [12]. In other words, effectiveness is the achievement of a target or goal by carrying out the right and appropriate actions. While the elements of the effectiveness criteria consist of accuracy: 1) time, 2) cost calculation, 3) measurement, 4) making choices, 5) thinking, 6) making orders, 7) setting goals and 8) goals [13].

Supervision is a systematic activity including setting standards, comparing real conditions with standards, determining and measuring deviations that occur and corrective actions. Artiya has a link between planning and supervision, so planning is a guideline for monitoring [14].

2.6 The role of industry 4.0 in public services

Another term for industry 4.0 is the digital revolution, the fundamental thing in digital mention is the occurrence of a computer revolution in all fields. These conditions make the world movement of the labor competition industry not monotonous or linear. Substitution of human power with robots causes cheaper, more effective, efficient.

3 Method

By using quantitative methods, this study chose descriptive study techniques. By trying to get

information in a descriptive and complete manner in a certain condition and situation according to Boyd, et al 1989 in [14].

3.1 Research variable

The research variables taken are 1) Still not optimal function and implementation of institutions in supervision, 2) Lack of community involvement. The following is a schematic variable that affects the effectiveness of monitoring spatial policy in protected areas. While the intervening variables include culture, costs and IT (Table 1).

Table 1. Research Variables

Independent Variable		Dependent Variable
Institutional	→	Effectiveness of supervision
The role of the community	→	
	Intervening Variable • Community culture in environmental protection • Cost • IT (era 4.0)	

3.2 Research Indicator

The classification of variables and indicators in this study selected 2 (two) variables to be examined, namely in the form of.

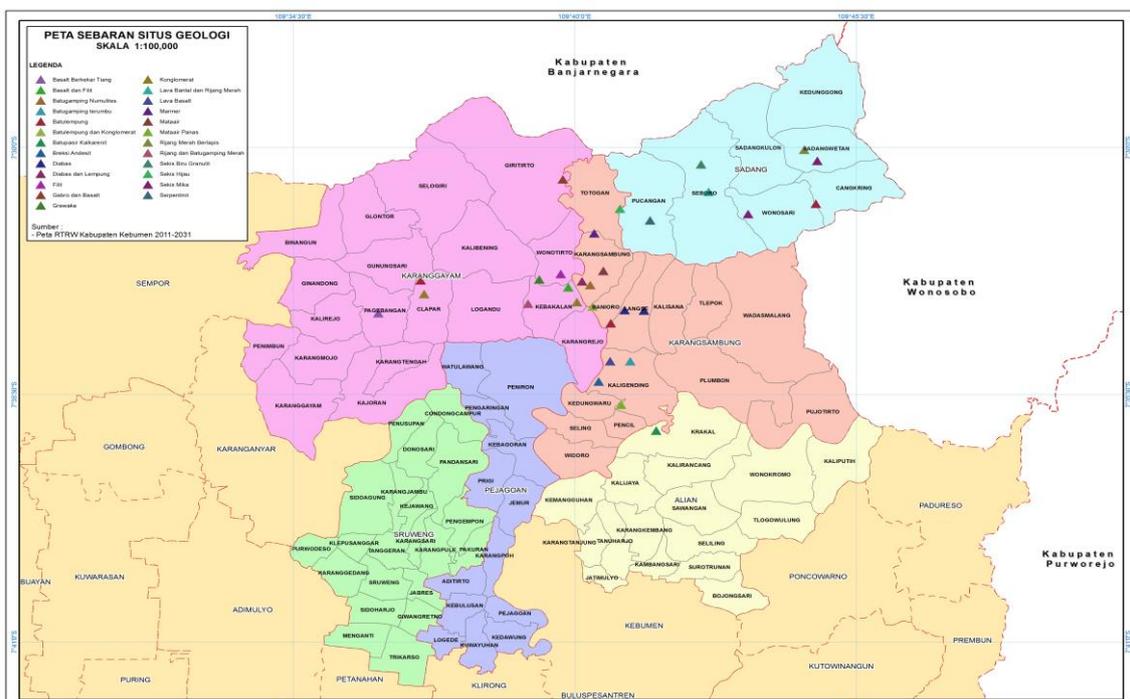
Table 2. Research Indicator

Variable classification	Indicator
Institutional Supervision	1. Role of external institutions (LIPI) 2. The role of internal institutions, in this case, the Regional Spatial Planning Coordinating Board (BKPRD)
Community involvement	1. The role of the community in delivering environmental information 2. Community involvement in activities supporting the environment

4 Results And Discussion

4.1 KCAGK Location Description

The Karangsambung Geological Reserve area in Kebumen Regency is located in 6 (six) sub-districts, namely: Karanggayam, Alian, Sadang, Karangsambung, Sruweng and Pejagoan. It has a land area of ± 22,154 Ha, with Desa Karangsambung in the center of the area. While the distance of the area to the urban center of Kebumen is ± 19 km. Geographically, the area is located in the north of the administrative district of Kebumen, which has the characteristics of valleys and hills as part of the Southern Serayu Mountains. The following is a map of the Karangsambung Geological Reserve Area in Kebumen Regency.



Source: RTRW Kebumen Regency
Fig. 1. Location of KCAGK in Kebumen Regency

4.2 Spatial planning policy at KCAGK

In 2008, based on the RTRWN (National Regional Spatial Planning) through PP (Government Regulation) No. 26 of 2008 stipulated a geological protected area as one of the national protected areas. Next in 2010 through the RTRW (Regional Spatial Plan) of Central Java Province with Regional Regulation No. 6 of 2010 reaffirmed the Karangsembung Geological Reserve Area. Lastly in 2012 through the RTRW (Regional Spatial Planning) of Kebumen Regency through Regional Regulation Number 23 of 2012.

4.3 The content of the RTRW to KCAGK

Regency RTRW is a strategic area according to environmental protection. In the general provisions of zoning regulations, states that the Karangsembung Geological Reserve protected area is prepared with the following provisions: 1) prohibited from carrying out activities that change certain geological forms that have benefits for the development of science, protection of flora and fauna, and water conservation; and 2) pay attention to the requirements for building establishment that support educational, research and tourism activities. Also in the content of the district RTRW also regulates: 1) Provisions for Licensing, 2) Provisions for Providing Incentives and Disincentives, 3) Community Participation and 4) Institutional.

4.4 Results

4.4.1. The Role of the Community in Supervision

Understanding of the RTRW policy, almost the majority did not know, only about 25% knew, but all respondents knew of KCAGK at their location. Lack of socialization was also felt by respondents, so most (76%) answered that socialization was not effective.

Table 3. Understanding and socialization of the RTRW

Understanding and socialization of the RTRW		
1.A	Understand/be aware of the RTRW	
	A	Understand/know 25.0%
	B	Do not know 75.0%
1B	Knowing the existence of KCAGK	
	A	Knowing 100.0%
	B	Do not know 0.0%
1C	Is there socialization?	
	A	There is 16.0%
	B	There is no 84.0%
1D	Has Effective Socialization Already?	
	A	It's effective 4.0%
	B	not so effective 20.0%
	C	Not yet / not 76.0%

On the indicators of mining licensing, the average answer is a difficult process (34%) and understands if there is no permission given for mining at KCAGK (30%).

Table 4. Mining licensing

Mining licensing		
2A	What about existing licenses?	
	a	No Easy / Difficult 34.6%
	b	Easy 11.5%
	c	Do not know 23.1%
	d	There is no permission 30.8%
2B	Why are miners not licensed?	
	a	There is no budget 22.6%
	b	Worry is not allowed 38.7%
	c	Difficult process 16.1%
	d	Do not know 22.6%
2C	Is it effective?	
	a	yes it's effective 0.0%
	b	not so effective 0.0%
	c	Not yet / not 76.0%
	d	Do not know 24.0%

As for intensive and disintensive provision, the whole is deemed necessary, but has not been implemented so far.

Table 5. Intensive and Disintensive Implementation

Intensive and Disintensive Implementation		
3A	Does it need to be applied?	
	a	Important 72.0%
	b	Not too important 12.0%
	c	No need 0.0%
	d	Do not know 16.0%
3B	Has it been applied?	
	a	Yes 0.0%
	b	Not yet / not 100.0%

Respondents' aspirations towards environmental monitoring were whether there had been 56% environmental monitoring from the local government answering it, while the rest answered they did not know and did not yet exist. While the opinions of respondents about environmental pollution mostly answered there, with the type of pollution in the form of loss of rocks and sand and river pollution. As for involvement in monitoring if there are pollution and environmental problems the respondents will be directly involved (56%) and report (34%) the rest are not involved.

Table 6. Environmental Monitoring

Environmental Monitoring		
4A.	Has there been monitoring so far?	
	a	Yes 56.0%
	b	Not yet / not 24.0%
	c	Do not know 20.0%
4B.	Is there environmental pollution felt in your environment?	
	a	Yes 80.0%
	b	There is no 20.0%
4C.	What pollution is there in your environment?	
	a	Rocks and sand 37.9%
	b	River 31.0%

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	c	Soil	6.9%
	d	Water	10,3%
	e	There is no	13.8%
4D. Is community involvement in environmental monitoring			
	a	directly involved	56.5%
	b	involved in reporting	34.8%
	c	not involved	8.7%

Environmental awareness indicators include obtaining information on whether there are concrete actions by the regional government on environmental issues at KCAGK, most of them have already known of actions (76%). The actions taken by the community if they are aware of the existence of environmental problems in the field are direct reprimand, especially carried out by community leaders (48%) while 48% will report to the village, LIPI or local community leaders.

Next is the involvement of local communities in protecting the environment, all respondents answered with activities such as voluntary work (84%), improving the environment (13%) and making local rules on environmental issues.

Table 7. Environmental Concern

Environmental Concern			
5A Are there actions taken due to existing environmental pollution?			
	a	There is	76.0%
	b	There is no	16.0%
	c	Do not know	8.0%
5B If there are environmental problems encountered in the field, what are your actions?			
	a	Direct warning	48.0%
	b	Report to the leadership	44.0%
	c	Ignoring	8.0%
5C Are there forms or roles in maintaining your environment			
	a	There is	100.0%
	b	There is no	0.0%
5D Role in maintaining the surrounding environment?			
	a	voluntary work	82.8%
	b	Make local rules	3.4%
	c	Improve environmental damage	13.8%

4.4.2 Institutional

A. LIPI (Indonesian Institute of Science)

A.1. Understanding and Dissemination RTRW

As a manager at KCAGK for the functions of education and conservation. The respondents' understanding of the spatial planning policy of the Spatial Plan all understood. While for policy dissemination activities, not all understand. For socialization initiatives carried out by LIPI, most of them are direct to the community (including students). The LIPI respondent believes that it is still not fully good at disseminating the RTRW regulations on KCAGK.

Table 8. Understanding and socialization of the RTRW

1. Understand/be aware of the RTRW	
a. Understand/know	100%
b. Do not know	0%
2. Is there RTRW policy socialization	
a. There is	25.0%
b. There is no	50.0%
c. There is	25.0%
3. Are there initiatives from your institution to support the dissemination of local regulations	
a. There is	100%
b. There is no	0%
4. to whom is the object of socialization given specifically related to KCAGK?	
a. Direct community	43%
b. socialite	29%
c. Miners	29%
5. Do you think that the above socialization has been effective?	
a. It's right	25%
b. not so effective	50%
c. Not yet / not	25%

A.2. Mining licensing

LIPI respondents' opinions on mining licenses at KCAGK include what causes unlicensed miners, the majority are worried that they will not be allowed (50%) and feel they do not need to be mined on their land despite being geodiversity (25%). Most of the miners' violations other than no permits are mining techniques that are not environmentally friendly and encroach on protected locations (40%). Internally LIPI's role in licensing is in the form of directives and recommendations.

Table 9. Mining licensing

1. Why are miners not licensed?	
a. There is no budget	0%
b. Worry is not allowed	50%
c. Difficult process	25%
d. Do not know	0%
e. Feel unnecessary	25%
2. What violations have been carried out by miners other than licensing?	
a. Limits of mining areas	40%
b. Mining technique is not correct	40%
c. Mining Geodiversity	20%
d. do not know	0%
3. what is the involvement of your institution in the implementation of licensing?	
a. Referrals and recommendations	100%
b. Monitor	0%
c. There is no	0%

A.3. Intensive and Disintensive Giving

The views of LIPI respondents towards the need for intensive and disintensive and have not been implemented so far (75%).

Table 10. Intensive and Disintensive Implementation

1. Does it need to be applied?	
a. Yes, Important	0%
b. Not Important	100%
2. Has it been applied?	
a. It is already done	0%
b. Half done	0%
c. Not yet	75%
d. do not know	25%

A.4. Environmental Monitoring

The involvement of LIPI in environmental monitoring is directly involved (60%), reporting (20%) and conducting environmental research (20%). The existence of staff involved in monitoring 75% answered there. The involvement of other institutions in environmental monitoring at KCAGK is evenly distributed between LIPI, provincial and district governments. Environmental problems in the form of rocks and sand (50%). While the opinions of LIPI respondents with mining still exist because there are no other jobs (60%).

Table 11. Environmental Monitoring

1. What is done by your institution in environmental monitoring at KCAGK	
a. Directly involved	60%
b. Provide periodic reports	20%
c. Conduct research related to environmental change	20%
2. Do you have special staff to monitor the environment at KCAGK	
a. There is	75%
b. There is no	25%
3. So far, who is involved in environmental monitoring at KCAGK?	
a. Internal LIPI	29%
b. Regency Agency / OPD	43%
c. Provincial Agency / OPD	29%
d. The other	0%
4. What pollution / environmental problems are there in your environment?	
a. Rocks and sand	50%
b. River	25%
c. Soil	13%
d. Water	13%
e. There is no	0%
5. Why do you think there is still mining at KCAGK?	
a. Good Income	0%
b. It is common	40%
c. There are no other jobs	60%

A.5. Financing

So far, financing has been through routine budget allocations (75%) and some have answered there is no specific location (25%).

Table 12. Financing

In the environmental supervision activities in your agency, where are the sources of funding?	
a. Allocation of routine budget	75%

b. Private assistance fund	0%
c. personal	0%
d. There is no allocational	25%

A.6. Recommendations for overseeing RTRW policies at KCAGK

Recommendations related to environmental monitoring of the RTRW Policy are to improve institutional synergy (40%), then 20% want the allocation of funds, the remainder is multiply socialization, involvement of local government and private roles.

Table 13. Recommendations for overseeing RTRW policies

a. Increase socialization	10.0%
b. Strengthen supervision from the community	10.0%
c. There is an allocation of funds under supervision	20.0%
d. Local governments are directly involved in supervision	10.0%
e. Law enforcement	0.0%
f. Increasing the role of CSR	10.0%
g. Institutional synergy	40.0%

B. OPD / BKPRD

B.1. Understanding and Dissemination RTRW

Overall, understanding the RTRW policy and socialization activities already exists, but implementation is still not optimal.

Table 14. Understanding and socialization of the RTRW

1. Understand/be aware of the RTRW	
a. Understand/know	100%
b. Do not know	0%
2. What form of socialization was carried out?	
a. Meetings/FGDs	80%
b. Media Advertising	0%
c. Social media (IT / era 4.0)	0%
d. Directly to actors in the field	20%
3. Do you think that the above socialization has been effective?	
a. It's right	25%
b. not so effective	75%
c. Not yet / not	0%

B.2. Mining licensing

Respondents' perception of illegal miners is that concern is not allowed (40%) and there is no funds (40%), while the rest is a difficult process. Associated with violations of illegal miners is mining technically not environmentally friendly (60%). While the role of OPD in licensing is direction and recommendations (100%).

Table 15. Mining licensing

1. Why are miners not licensed?	
a. There is no budget	40%
b. Worry is not allowed	40%
c. Difficult process	20%
d. Do not know	0%
e. Feel unnecessary	0%

2. What violations have been carried out by miners other than licensing?	
a. Limits of mining areas	20%
b. Mining technique is not correct	60%
c. Mining Geodiversity	20%
d. do not know	0%
3. what is the involvement of your institution in the implementation of licensing?	
a. Referrals and recommendations	100%
b. Monitor	0%
c. There is no	0%

B.3. Intensive and Disintensive Giving

The importance of intensive and disintensive is the answer of all respondents, but the application of most answers does not yet exist (75%).

Table 16. Intensive and Disintensive Implementation

1. Does it need to be applied?	
a. Yes, Important	100%
b. Not Important	0%
c. No need	0%
d. Do not know	0%
2. Has it been applied?	
a. It is already done	25%
b. Not yet	75%

B.4. Environmental Monitoring

OPD involvement 40% answered that they were not involved, gave reports of 40% and only 20% were directly involved. All respondents answered that they did not have human resources under supervision. In the supervision of involvement in KCAGK, the answer was carried out by the provincial government (44%), the rest were LIPI and the regional government. Most of the environmental problems that occur in KCAGK answer rock and sand pollution (50%). Whereas the perception of OPD related to the existence of mining is that there are no other jobs.

Table 17. Environmental Monitoring

1. What is done by your institution in environmental monitoring at KCAGK?	
a. Directly involved	20%
b. Provide periodic reports	40%
c. There is no	40%
2. Do you have special staff to monitor the environment at KCAGK	
a. There is	0%
b. There is no	100%
3. So far, who is involved in environmental monitoring at KCAGK?	
a. Internal LIPI	22%
b. Regency Agency / OPD	22%
c. Provincial Agency / OPD	44%
d. The other	11%
4. What pollution / environmental problems are there in your environment?	
a. Rocks and sand	50%
b. River	17%

c. Soil	0%
d. Water	17%
e. There is no	17%
5. Why do you think there is still mining at KCAGK?	
a. Good Income	0%
b. It is common	33%
c. There are no other jobs	67%

B.5. Financing

Indicators of financing respondents answered there were routine allocations (50%) and no allocations (50%).

Table 18. Financing

In the environmental supervision activities in your agency, where are the sources of funding?	
a. Alokasi dari anggaran rutin	50%
b. Private assistance fund	0%
c. Personal	0%
d. There is no allocational	50%

B.6. Recommendations for overseeing RTRW policies at KCAGK

Advice from OPD respondents related to environmental monitoring at the RTRW's policy, most of them want adequate funding (36%), the role of local communities needs to be strengthened in supervision (27%), and the existence of institutional synergy (27%).

Table 19. Recommendations for overseeing RTRW policies

a. Increase socialization	9.1%
b. Strengthen supervision from the community	27.3%
c. There is an allocation of funds under supervision	36.4%
d. Local governments are directly involved in supervision	0.0%
e. Law enforcement	0.0%
f. Increasing the role of CSR	0.0%
g. Institutional synergy	27.3%

5 Conclusion

There is a relationship if it is compared between the public's understanding of the RTRW policy and the respondent's answers in the institution (LIPI and OPD), where the community does not understand the existence of RTRW with socialization that is still not optimal according to institutional respondents' answers.

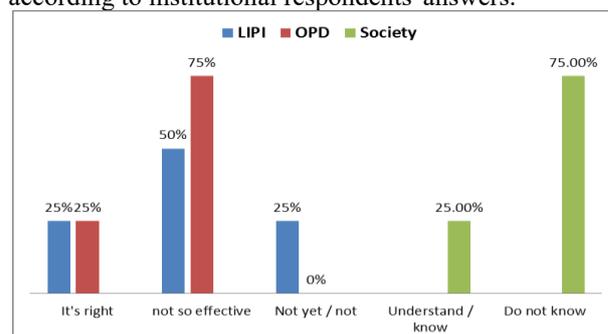


Fig. 2. Graphic relationship if it is compared between the public's understanding of the RTRW policy

The community's understanding of KCAGK all knows, due to the role of LIPI in KCAGK. In terms of licensing, most miners understand that the activities carried out are illegal because there are no more permits at KCAGK. This condition was strengthened by institutional respondents who chose to worry from miners not allowed. The most violations of illegal miners are mining techniques that are not environmentally friendly.

All respondents on average feel the importance of being intensive and disintensive, but there is no application in the field. Involvement of environmental monitoring of community respondents (community leaders) has been carried out and the desire to be involved in maintaining the environment at KCAGK. Problems arise because they have no place/place specifically in environmental supervision, the absence of funds is an obstacle. While the supervision carried out by the OPD through BKPRD did not work, because the establishment of this institution based on the organizational structure in its implementation on duty was a person who understood the substance.

6 Recommendation

- 1) As a follow-up, this study informs that in the implementation of spatial planning during this stage the supervision is less priority.
- 2) Opportunities through community leaders can be in the form of a forum to protect the environment, including the supervision of protected areas as strategic areas according to the RTRW.
- 3) The role of BKPRD needs to be reviewed again, both as a function and as an institutional formation.
- 4) The allocation of funding needs to be increased and institutional synergy improved between LIPI and OPD (district and provincial governments) in KCAGK supervision activities.
- 5) With the weak RTRW policy socialization, it is necessary to immediately change the policy supervision approach, namely by implementing an IT-based monitoring system. Industry application 4.0 is expected to be able to answer the lack of human resources, supervision costs.
- 6) Academically this research can be continued by looking at how they form and container of the community in the supervision of the protected area on the RTRW.

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