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PROSPECTIVE ANALYSIS OF FLOATING NET CAGES REDUCTION STRATEGY IN CIRATA RESERVOIR (CASE STUDY OF CIRANJANG SUB-DISTRICT CIANJUR DISTRICT WEST JAVA)

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KeyWords

cirata reservoir, floating net cages reduction strategy, prospective analysis, stakeholder

ABSTRACT

Research was conducted in Ciranjang Sub-district, Cianjur District, West Java on February to July 2018. Research aims to analyze influential stakeholder in reducing the number of floating net cages in Cirata Reservoir and analyze the strategies that must be done by stakeholder to reduce the number of floating net cages in Cirata Reservoir in order to be realized. The research was conducted by descriptive qualitative with prospective analysis approach. The technique of taking respondents conducted by purposive random sampling. Selection of respondents based on skills and expertise in accordance with the topic of research. Results show that the most influential stakeholder in the effort of reducing the number of floating net cages in Cirata Reservoir especially Ciranjang District is BPWC, Koramil Ciranjang and Dinas Kelautan dan Perikanan Kabupaten Cianjur. Floating Net Cages reduction can be realized if optimizing the role of influential stakeholder.

INTRODUCTION

One of area in West Java which is well known as the utilization of reservoir as a source of livelihood is Cirata Reservoir. This reservoir was built in 1988, located at 221 m above sea level. The extent of 6,200 hectares (ha), 34.9 m average depth, and 2,165 x 106 m³ volume (Garno 2002). The main functions of this reservoir are as hydroelectric power (PLTA) and secondary function as aquaculture area, water transportation and recreation.

Currently there has been overcapacity of floating net cages (KJA) in Cirata Reservoir. According to BPWC in 2016 the number of KJA is 77,195 plots. Exceeded the allowable amount of 12,000 plots. Special policies are required to reduce the amount of KJA in accordance with the carrying capacity of the environment with the pattern of production quota allotment (Rahmani et al. 2011).

Fisheries are one of the important sectors that contribute to Gross Regional Domestic Product (GRDP), especially in areas close to maritime due to their activities in the fishing business (Rizal 2017). According to Suryana (2013), the reduction of KJA will directly affect the number of KJA units that operate, the production produced, the input quantities, especially seeds, feed input, the amount of labor, contribution to GRDP and contribution to PAD (known as *penghasilan asli daerah*).

Formulation strategy that will be developed in this research is formulated based on scenarios that may occur in the future (prospective strategic). The scenarios wasbased on the likely future situation on the key factors that affect the reduction quantity of KJAs. According to Wibowo (2010), a prospective analysis is used to predict future possibilities based on influencing factors.

METHODS

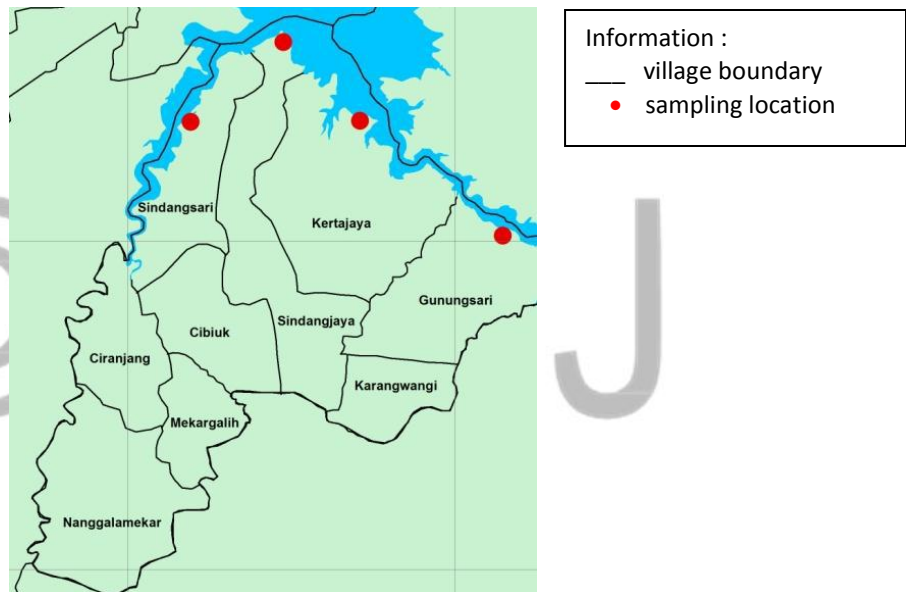


Figure 1. Research location

The research was conducted in Ciranjang Sub-District, Cianjur District, West Java on February to July 2018. The research was conducted by descriptive qualitative approach with purposive sampling technique method. Data were collected by interview, direct observation, and literature study. Selection of respondents based on ability and expertise as well as interests in accordance with the topic of research.

Data analysis method used prospective analysis. Prospective analysis is a method used to analyze problems in a system that can incorporate decision makers in order to rearrange multiple plans with different approaches. Stages of prospective analysis by Hardjomidjojo in Wibowo (2010) are:

1. Determining the purpose of the system under study.
2. Identify influencing factors.
3. Assessment of direct influence between factors.

Table 1. Prospective Analysis Assessment Guidelines

Influence	Score
0	No effect
1	Small effect
2	Medium effect
3	Influential is very strong

4. Preparation of the state that may occur (state) on the factor.
5. Build and choose scenarios.

RESULTS AND DISCUSSION

Results of stakeholder analysis that have an effect on the reduction of KJA in Cirata Reservoir are presented in table 2.

Table 2. Stakeholders who influence the reduction of KJA

No	Stages	Stakeholder
1	Sosialization	BPWC, Dinas Kelautan Perikanan dan Peternakan (DKPP), Koramil Ciranjang, Polsek Ciranjang, Academic Side
2	Implementation	Koramil Ciranjang, Polsek Ciranjang, BPWC, Dinas Lingkungan Hidup (DLH)
3	Post Implementation	Dinas Kelautan Perikanan Dan Peternakan, BPWC, Dinas Pariwisata Kepemudaan dan Olahraga (DPKO), Koramil Ciranjang, Polsek Ciranjang, Perangkat Desa, Academic side

Sosialization

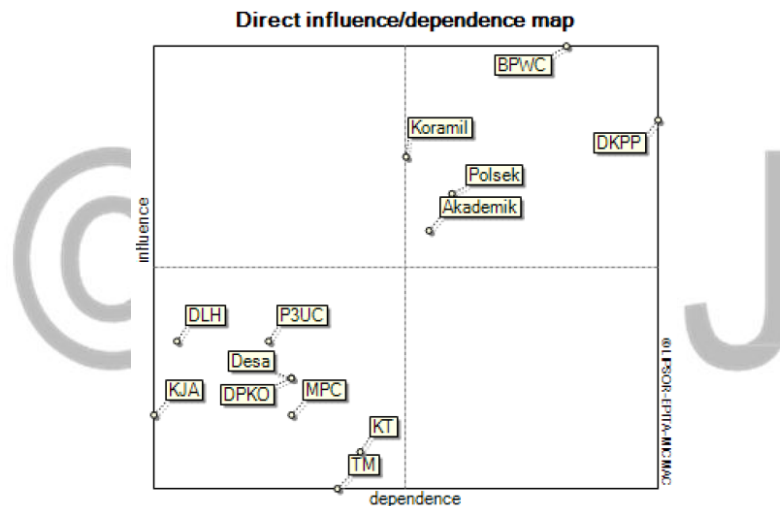


Figure 2. Micmac analysis result in socialization stage

Information :

Akademik	: Academic Side
BPWC	: Badan Pengelola Waduk Cirata
Desa	: Perangkat Desa
DKPP	: Dinas Kelautan Perikanan dan Peternakan Kabupaten Cianjur
DLH	: Dinas Lingkungan Hidup Kabupaten Cianjur
DPKO	: Dinas Pariwisata Kepemudaan dan Olahraga Kabupaten Cianjur
KJA	: KJA Bussines Owner
Koramil	: Koramil Ciranjang
KT	: Karang Taruna
MPC	: Masyarakat Peduli Cirata
P3UC	: UPTD Pengembangan Perikanan dan Perairan Umum Kabupaten Cianjur
Polsek	: Polsek Ciranjang
TM	: Public Figure

Result of analysis showed that BPWC, DKPP, Polsek Ciranjang, Koramil Ciranjang and Academic side are in second quadrant (stakes variable). DLH, MPC, Perangkat Desa, P3UC, DPKO, KJA Bussines Owner, KT and TM are in fourth quadrant (autonomous).

Variables in first quadrant and second quadrant are the key variables that have the most influence on KJA reduction. This position provides an overview for decision makers that sub-elements in the sector are carefully reviewed, because interaction between sub-elements can affect the success aquaculture of KJA in Cirata Reservoir (Widiyati 2009).

Variables in fourth quadrant (autonomous) do not play a role in the socialization of KJA reduction and the weak dependence on other systems. According Widiyati (2009) the influence is weak and the level of interconnection with other stakeholders in the management of aquaculture of KJA in Cirata Reservoir is weak.

Implementation.

Results showed that Koramil Ciranjang, BPWC, Polsek Ciranjang and DLH were in the second quadrant (stakes variable). DKPP and DPKO are in the third quadrant (dependent variable). Desa, MPC, TM, KJA business owners, Academic side, KT and P3UC are in the fourth quadrant (autonomous variable).

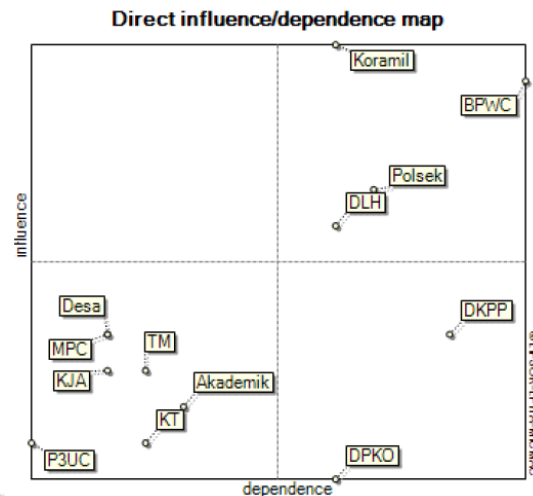


Figure 3. Micmac analysis result in implementation stage

There are no independent stakeholders in the implementation of KJA reduction in Cirata Reservoir. This indicates that the reduction of KJA can not be conducted by one of stakeholder without calculate the linkage between stakeholders. In second quadrant (variable stakes) there are Koramil Ciranjang, Bpwc, Polsek Ciranjang And DLH. It means that 4 stakeholders play an important role in the implementation of KJA reduction in Cirata Reservoir, especially in Ciranjang Sub- District.

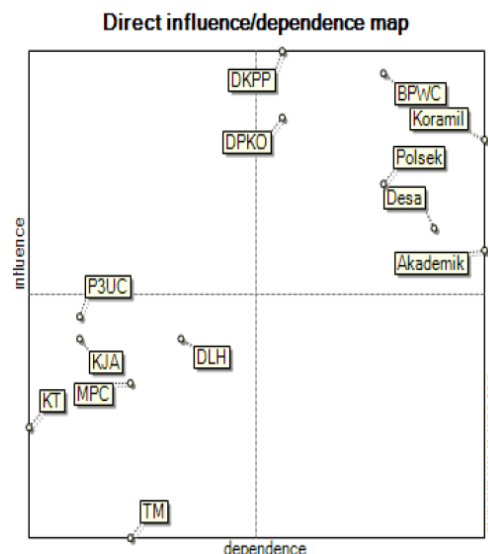


Figure 4. Micmac analysis result in post implementation

Role of variables in the fourth quadrant (autonomous variables) was same as a technical aide. This stakeholder will be assisted in controlling KJA and garbage in Cirata Reservoir area. Desa, MPC and TM are needed to mobilize local residents in KJA reduction. In addition, it also provides an education to the community around the reservoir to maintain the preservation of reservoir.

Result showed DKPP, Koramil Ciranjang, DPKO, BPWC, Polsek Ciranjang, Desa and Academic side are in second quadrant (stakes variable). Other stakeholders are P3UC, KJA Bussines Owner, DLH, MPC, KT and TM are in fourth quadrant (autonomous variable).

According to data from the DKPP, in 2017 Cianjur Regency freshwater production is 120,594.27 tons. 60,637.05 tons or half of total production was produced by KJA in Cianjur regency. As a direct consequence, this KJA reduction will result in reduced production (Suryana 2013). According to Ade Durahman (51) to resolve this situation, DKPP will make land transfers. Aquaculture that was originally done in the reservoir will be moved to land.

According to Agus (60) DPKO is one of the beneficiaries of Cirata Reservoir. Cirata Reservoir is one of tourism destination in Cianjur Regency. For example a floating restaurant in Jangari area. Positive impact of KJA reduction will affect the tourism aspect. With the reduction of KJA, it is expected that the waters environment of Cirata Reservoir will be clean. Thus DPKO can bring innovation new innovation in terms of water tourism in Cirata Reservoir.

The role of Polsek, Koramil Ciranjang and BPWC in the post-implementation phase of KJA reduction is as a controller. This stakeholder is assigned to oversee KJA business practices. It is feared after the enforcement will remain illegal KJA operated at Cirata Reservoir. The role of Academic side in the post implementation phase is quite important. research from the Academic side can be considerable input. Research can be directed to all sides.

Scenario Arrangement

KJA reduction scenarios in Cirata Reservoir is based on the key factors influencing the reduction of KJA. It is intended to predict the likelihood that the factor may occur, whether it will develop in a better direction from now, remain, or will be worse than the present situation. Wibowo (2010). This result can provide alertness for policy maker to execute the chosen strategy. From the analysis results, the state (state) that may occur is presented in table 3.

Table 3. Possible state in reducing KJA in Cirata Reservoir

No	State
1	Purpose of KJA reduction are not conveyed overall during socialization
2	The solution of the impact of KJA reduction is unclear
3	The method of KJA reduction is not appropriate
4	Lack of control at the post implementation stage

The purpose of KJA reduction allegedly not conveyed overall. This evidenced by the presence of stakeholder who refuse to KJA reduction. Stakeholder are mainly from among KJA business owners. According H. Cucu (54) them, KJA is not the only cause of contamination of Cirata Reservoir but many other factors such as factory waste which is passed by Citarum river flow.

Reduction of KJA in Cirata Reservoir means eliminating the livelihood of some people who are involved in KJA business. According to Widiyati (2012) most of the people around Cirata Reservoir area make a living as a fish farmer on land and as a fish farmer at the reservoir. So, solution is needed to resolve the loss of these livelihoods. Allegedly the solution offered primarily to business actors KJA not yet fully clear. This is evidenced by a complaint from business actors regarding the forward plans offered due to the reduction of KJA.

Another possible condition is ineffective reduction of KJA. The point is that the method used is not quite right. There are several methods of KJA reduction that can be based on ownership, based on quantity, based on location, based on construction, and based on conditions. This method should be studied deeply in terms of implementation sequences.

KJA reduction based on ownership is expected to be difficultly implemented due to the large number of frauds. According to Local Regulation no.7 2011, 1 of patriarch allowed to have only 5 units of KJA. 1 KJA unit consists of 5 plots. So 1 patriarch allowed to have only 20 plots KJA. The reality on the ground is not so. According H. Cucu (54) it was falsified by fake patriarch to increase the number of KJA. Fraud is not only initiated by KJA business actors but the elements in the licensing circle either in the relevant office or others. This is what causes the overcapacity of KJA in the Cirata Reservoir.

The method of KJA reduction can also be done based on the ownership of the indigenous or migrant. According to Hidayat (2016) policy can be directed to the restriction of business capital from outside the region which is a temporary profit. Viewed from the BPWC data of 2016 on the number of business actors in the Cirata KJA Reservoir, of 3,515 business actors, 768 of whom are immigrants. If returned to the original purpose of the establishment of KJA that is actually destined for indigenous then this can be taken into consideration. Indigenous person should be prioritized to have KJA business in Cirata Reservoir.

Reductions based on quantity can be realized after the exact data related to the number of KJA in Cirata Reservoir. The ideal thing in reducing the number is to review the maximum number allowed for KJA in Cirata Reservoir. There should be implementation of policy limiting the number of KJA according to reservoir capacity, optimization of KJA aquaculture using a two layer nets system, cultivation of marginal land reservoir and reduction of reservoir work activity (Hidayat et al 2016).

Reductions based on location are addressed to the KJA designation zone. According to West Java Governor's Decision no. 41 2002, puddle area that can be used for KJA business activity is 48 ha. KJA location should be adjusted so as not disturb with Cirata Reservoir function. In accordance with the statement of Lukman (2011) that need to be considered determination of KJA location, control and monitoring of its environment.

The most ideal and feasible to make the reduction based on the conditions first. In 2016, 77.195 KJA plots in the Cirata reservoir, 1806 of them are KJA which is already damaged and unused (1187 plots in Cianjur District) At least this method is done early considering the process of KJA reduction is also not possible all at once.

Positive impact that may be felt is the return of clean and bea Cirata Reservoir. In addition, the function of Cirata Reservoir as a hydropower will also last longer. However, it is suspected that the negative impact will be expected to be felt first by stakeholders, especially KJA business actors. With the reduced KJA then their income will be reduced so it needs another alternative.

Controlling and evaluation become an important aspect in the post implementation phase of KJA reduction. According to Widiyati (2009) monitoring and evaluation become the required program in the management of sustainable aquaculture KJA in Cirata Reservoir. If there is no strict controlling by the relevant agencies on KJA business practices, it's not impossible that KJA overcapacity will remain due to the illegal KJA in Cirata Reservoir.

Operational Recommendation

Operational recommendations for KJA reduction in Cirata Reservoir are prepared based on scenarios and possibilities that exist at the socialization, implementation and post implementation stage. The recommendations are based on data analysis, expert opinion and literature study. Recommendations focus on influential stakeholders at each stage by combining the best possible possibilities that stakeholders can implement. Operational recommendations can be seen in table 4.

The role of BPWC it's needs to be optimized as the most influential stakeholder for socialization in order to well. In addition, socialization should be followed by all relevant stakeholders so that the purpose of KJA reduction can be understood by all stakeholders. Implementation of socialization should be carried out on target by considering operational cost for socialization. It would be better if there are frequent discussions between stakeholders in depth so that the purpose of this reduction can be understood.

In strategic places should be installed bilborad, posters and leaflets that contain about KJA reduction plan as part of the program of "Citarum Harum" can be known by the public. This poster is made to attract public attention. In the poster described how this KJA reduction plan be held.

Table 4. Operational recommendation KJA reduction

No	Stage	Form of Activity	Executor
1	Sosialization	Collect all stakeholder representatives in a forum	BPWC, Koramil Ciranjang, Polsek Ciranjang
		Creat of posters and leaflets on the reduction of KJA and installed in strategic places.	BPWC, DKPP
		Submission of the program plan for mitigating the impact of KJA reduction	DKPP
		The strengthening of KJA reduction reasons is supported by statistical data	Academic side
2	Implementation	Collecting data on the number of KJA plots, KJA business owners, number of immigrants and indigenous people, KJA conditions, and complaints of KJA business actors.	BPWC
		Determination of operating targets	BPWC
		Recommendation reduction method	DLH, BPWC
		Execution of KJA reduction	Koramil Ciranjang, Polsek Ciranjang
3	Post Implementation	Transfer of cultivated land to inland waters.	DKPP
		Management of catch fisheries	DKPP
		Guidance and education regularly to KJA business actors	DKPP, Perangkat Desa
		Cooperation with investors in the framework of empowering communities affected by KJA reduction	DKPP, Perangkat Desa
		Regular monitoring of KJA's business practices	Koramil Ciranjang, Polsek Ciranjang, Perangkat Desa, BPWC
		Water tourism development Cirata Reservoir	DPKO
		Research that is recommendation or reporting of Cirata Reservoir situation	Academic side

At the time of socialization should have clearly disclosed the solution of KJA reduction policy, especially to business actors who in fact lost their livelihoods. In this case, DKPP plays an important role as an erector of KJA business actors. They should have planned the program to resolve the impact of KJA reduction. Possible options are to change the direction of the cultivation business to capture fisheries or divert the cultivated land to the inland waters. According to Widiyati (2009) it is necessary to increase participation of stakeholders around the reservoir area (fish farmers, fish feed mill managers) with intensive counseling by related institutions on the management of Cirata Reservoir.

The first step in the implementation phase is collecting data. Data collection process needs to be held in detail from the number of plots of KJA, KJA business owners, the number of immigrants and indigenous people, KJA conditions, and KJA business actor complaints. The complaints or constraints of business actors need to be taken into consideration in taking the method of implementing KJA reduction and its impact. Data collection should be held by BPWC as manager of Cirata Reservoir.

After the data collection can be determined the target operation. Try to get back on initial number based on West Java Governor's Decision no. 41 2002 is 12,000 plots for 3 districts are the most ideal thing for now. So from the current number (77,195 plots) should be reduced by 69,195 plots. For Cianjur region from the current number (34,081 plots) should be reduced by 28,621 plots.

The operational target is a reference for the implementers, namely Koramil Ciranjang and Polsek Ciranjang in implementing KJA reduction. It takes the best method to consider ecological, economic, social and cultural aspects. The recommendations are expected to emerge from the DLH. Through the Program of Control and Destruction of Environment and Conservation of Natural Resources, expected to give recommendation of method at least in ecological terms.

In implementation stage need to be optimized the role of Koramil Ciranjang as the most influential stakeholder. Koramil Ciranjang is the main executor of KJA reduction. According Ummah (2015) existing formal rules govern the management of fishery resources (KJA) covering economic and conservation objectives (protection against reservoir resources), but the implementation of the rules has not been implemented. Koramil Ciranjang as law enforcement is expected to implement the rule is optimally.

Interviews with stakeholders and data in the field, can be conclude that the most ideal method to take precedence is to reduce based on conditions or reduce the KJA that has been broken and unused (non-active) first. Then held reduction based on quantity and ownership. This intended for KJA business actors can still operate and earn income from KJA at least in the first year.

One alternative to anticipate the reduction of KJA that operates in reservoirs such as Cirata is to encourage increase production from freshwater aquaculture using media other than KJA, either in the form of ponds, swamps or rice field (Suryana, 2013). According to Statistics Book of Dinas Kelautan Perikanan dan Peternakan in 2017 there are still 14,360,000 m² of quiet water ponds in Cianjur District. Thus the cultivators or business actors from the Cirata Reservoir are very likely to be moved to the land. In this case, DKPP and Perangkat Desa is on duty of providing land for the transfer of the aquaculture

Reduction of labor due to KJA rationalization will lead to unemployment in rural areas around the reservoir (Suryana 2013). This reduction will also make the absorption of labor will be stopped. Therefore, the increased potential for unemployment due to this rationalization should be anticipated. One of the anticipation of unemployment due to reduction KJA can be done with increasing labor absorption and increasing aquaculture area.

The catchment sector of common waters in Cirata Reservoir has not received more attention than other fishery sectors. This is reflected in the still complex problems in the management of reservoir fisheries. With the reduction of KJA in Cirata Reservoir, the land for capture fisheries will be more open. This sector needs to be improved. Seed fish can be stocked in Cirata Reservoir. According to Anna (2016), sustainable fisheries management is required through input or output restrictions. The restrictions are based on overfishing that has occurred in the Cirata Reservoir.

The economic and cultural aspect became the heaviest focus after implementation of KJA reduction. One of actions that can be done to resolve the economic problems that expected to arise due to reduction of KJA in Cirata Reservoir is work with investors to empower the community, especially the KJA business actors. Accompanied with the guidance and education from DKPP. The educational system is essential for skills development, a fact that has long been recognized by policymakers and educators (Rizal 2012).

One alternative to empower the community is by doing water hyacinth processing that currently covers the waters of Cirata Reservoir. Utilization of water hyacinth into derivative products that have economic and social value is the optimal use of water hyacinth, so water hyacinth is no longer a threat to the continuity of Cirata Reservoir function as power plant, public water transportation, and recreation area (Nurhayati 2018). Hyacinth can be used as alternative feed ingredients. In addition it can be used as handicrafts and decoration.

According to Nurhayati (2015) there is inconsistency of West Java Provincial Government in the use of Cirata Reservoir as public waters, for example in the case of issuance of permit cultivation that is not based on the aquaculture map, should be an important part in supporting the continuity of cultivation in Cirata Reservoir. Since 2012 it has not been issued LPL license (Location Placement Letter) by BPWC. Because do not exist firm action for violators, so far the problem of overcapacity is still continuing. After the reduction of KJA, the controlling of KJA business practices is required. The controlling should be held periodically by BPWC accompanied by Koramil Ciranjang and Polsek Ciranjang.

Conclusion

1. Stakeholder most influential in efforts to reduce the number of KJA in Cirata Reservoir, especially Ciranjang Sub-district is BPWC, Koramil Ciranjang and DKPP. BPWC is influential in the socialization stage, Koramil Ciranjang is influential in the implementation stage and DKPP influential in the post implementation stage.
2. KJA reduction can be realized if optimizing the role of influential stakeholders.

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