Global Scientific JOURNALS

GSJ: Volume 7, Issue 1, January 2019, Online: ISSN 2320-9186

www.globalscientificjournal.com

PROSPECTIVE ANALYSIS ON STRATEGY OF REDUCING THE NUMBER OF FLOATING NET CAGES IN CIRATA RESERVOIR (CASE STUDY OF CIKALONGKULON, CIANJUR REGENCY, WEST JAWA)

Asep Agus Handaka Suryana [1)], Tanti Rinjani [2)], Iskandar[1)] and Atikah Nurhayati[1)]

[1)] Lecturer at the Faculty of Fisheries and Marine Sciences, Padjadjaran University
[2)] Student at the Faculty of Fisheries and Marine Sciences, Padjadjaran University

Keywords: Prospective Analysis, Floating Net Cages, Stakeholders, Cirata Reservoir

ABSTRACT

This research was conducted in Cikalongkulon, Cianjur Regency, West Java. It began in April-October 2018. It is aimed for determining the influential stakeholders in the Floating Net Cages reduction in Cirata Reservoir and determining the strategies that must be done to reduce the number of Floating Net Cages. The methods used were qualitative descriptive and quantitative with prospective analysis approach. Purposive sampling and snowball sampling methods were used as the sampling method with the total of 30 respondents. Respondents were selected based on their background ability, interest, and influence in the Floating Net Cages reduction. The results of this research showed that the most influential stakeholders in reducing the number of Floating Net Cage as placed in quadrant II are Cirata Reservoir Management Agency, Indonesian National Armed Forces (KODAM, KODIM, KORAMIL, BABINSA), and the Department of Marine, Fisheries and Animal Husbandry in Cianjur Regency. The reduction number of Floating Net Cage can be realized if the role of the influential stakeholders in these activities is optimized. The strategy for 2023, Cirata Reservoir Zero Floating Net Cage, needs to be reviewed since it affects fish farming using Floating Net Cages sector and other supporting sectors. The proposed strategy is doing the reduction activity by referring to the Governor's Decree No. 41 of 2002.

INTRODUCTION

Cirata Reservoir is one of the reservoirs formed from the Citarum River dam. The area is 7112 ha and the inundation area is 6200 ha. Cirata Reservoir inundates 32 villages and 7 sub-districts in 3 regencies, namely West Bandung Regency, Cianjur Regency and Purwakarta Regency with the largest inundation in Cianjur Regency which is 29,603.299m^2. The main function of Cirata Reservoir is as a Hydroelectric Power Plant. Cikalongkulon is one of 7 sub-districts inundated by Cirata Reservoir in Kamurang village. In this village, many people derive their livelihood from Cirata Reservoir especially by doing aquaculture using the Floating Net Cage system.

The extensive reservoir condition creates a variety of interests utilizing these resources. The use of Cirata reservoirs as fish cultivation place with the Floating Net Cage system can improve the economy of the surrounding communities both in direct employment in aquaculture activities and employment in other supported activities. Freshwater cultivation business using Floating Net Cage system is considered as the most effective and productive business (Ummah 2015).

The open access state of the reservoir causes everyone to freely make Floating Net Cage. According to census data by the Cirata Reservoir Management Agency, the Floating Net Cage overcapacity has occurred since 1996. In May-June 2018, it has become 98,397 plots (Figure 1). Cikalongkulon itself is the location with the third highest number of Floating Net Cage in 2018 as many as 12,180 as can be seen in Appendix 1. The amount of Floating Net Cage found in Cirata Reservoir, especially in Cikalongkulon has exceeded the maximum limit set by the Governor Decree No. 41 of 2002, concerning the maximum number of Floating Net Cage in the Cirata Reservoir which is 12,000 plots.

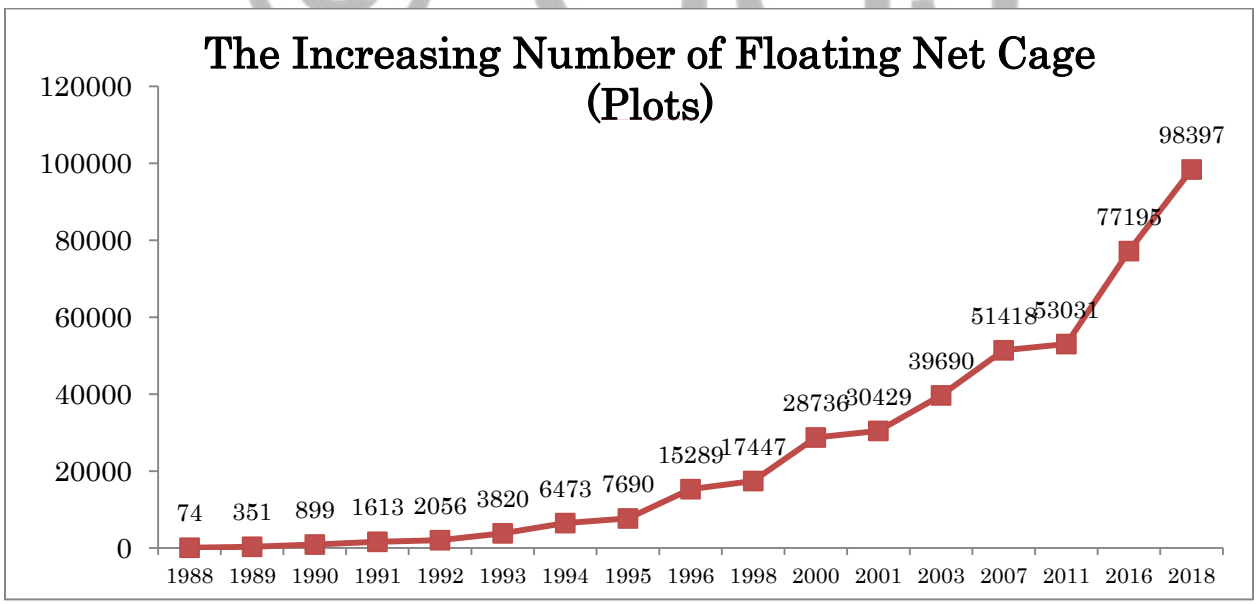

Figure 1. The Increasing Number of Floating Net Cage
Source: Cirata Reservoir Management Agency 2018

The growth number of the Floating Net Cage has been out of control increasing. This is indicated by the extraordinary increase in Floating Net Cage number since the reservoir was used as a fish cage farming production area from 1988 to 2018 (in 1988 the number was less than 100

plots). This shows that fish farming activities with Floating Net Cage provide great economic benefits. Although it is initially considered to provide real economic benefits, it turns out gives or raises problems that cannot be ignored (Zahidah 2004). It has also exceeded the carrying capacity of Cirata, causing the declining quality of the water because of the waste from aquaculture activities, destructed ecosystem for dissolve feed, disrupted hydroelectric power plant, pollution in Citarum upstream, and sedimentation increase in Cirata (Oktaviani 2015).

If the pollution and damage caused by the increasing number of Floating Net Cage left unchecked, it will create new problems and threaten the existence of Cirata Reservoir that functions are needed by all parties. Hence, reducing the number of Floating Net Cage is necessary in order to reduce pollution and damage in Cirata Reservoir and also implement government programs, namely Harum Citarum, which is reinforced by the Presidential Regulation Number 15 of 2018 concerning the Acceleration of Pollution Control and Damage of Citarum Watershed.

The right strategy is needed to fix this problem as it concerns the lives of many people. Not only environmental issues, but also social and economic issues are affected. The strategy is expected to run optimally to achieve the desired objectives. So, the contribution of stakeholders who play an important role in reducing the number of Floating Net Cage is needed to fix the problem and keep Cirata Reservoir as what it is intended.

The purpose of this research is to analyze and determine the influential stakeholders in an effort to reduce the amount of Floating Net Cage in Cirata Reservoir and determine the strategy that must be done by the government so that Cirata Reservoir run optimally.

METHODS

The method used in this research is descriptive approach. Descriptive methods are carried out to identify and analyze real conditions and various problems occur during the research.

Descriptive analysis method is used in this research by applying a prospective analysis model approach. Prospective analysis aims at predicting the possibilities that will occur in the future in accordance with the achieved objectives.

In this research, researchers used a Purposive sampling technique, which is the intentionally selection of the key informants to provide information in accordance with the research objectives (Siyoto and Sodik 2015). Respondents from Floating net cage owners or cultivators were chosen using the Snowball Sampling technique in which the researcher selected certain people who are considered to provide the required data. Then, based on the data or information obtained from the previous sample, the researcher determined other samples considered to provide more complete data (Sugiyono 2016).

Respondents consisted of key respondents (experts) and ordinary respondents with the total number of 30 people. Respondents in this study consisted of the Department of Marine, Fisheries and Animal Husbandry of Cianjur, Cirata Reservoir Management Agency, Indonesian National Armed Forces (KODAM, KODIM, KORAMIL and BABINSA), competent lecturers on water resources management in the Faculty of Fisheries and Marine Sciences at Padjadjaran

University, Floating Net Fish Cultivation entrepreneurs in Cirata, Cikalongkulon Police, Chair of Cirata Community Care, community leaders, Department of the Environment of Cianjur, Cianjur Fisheries and Water Conservation Center, Department of Tourism, Members of Cirata Reservoir Fish Cultivation Association, village officials and Kamurang Village Youth Organization.

Data analysis

The data is analyzed using prospective analysis approach with the assistance of MICMAC software. The results of the analysis will be described using descriptive analysis and compared with the interviews results in the field. The prospective analysis stages in this research are as follows:

(a) Identifying determinants in the future;
(b) Determining the strategic objectives and interests of the main actors; and
(c) Defining and describing possible evolution in the future (Bourgeois 2004).

All factors identified will be assessed directly with the assessment guidelines as shown in Table 1 below.

Table 1. Assessment Guidelines

Score	Influence
P	Potentially having role or doubted
0	No role
1	Small role
2	Medium role
3	Very important role

Results of diverse assessment will be normalized, so that each stakeholder has impact value and dependence value on linkages between stakeholders. These values will be plotted on a diagram of the stakeholders influence on the system and dependence between stakeholders, so that each stakeholder will be scattered to four quadrants (Figure 2)

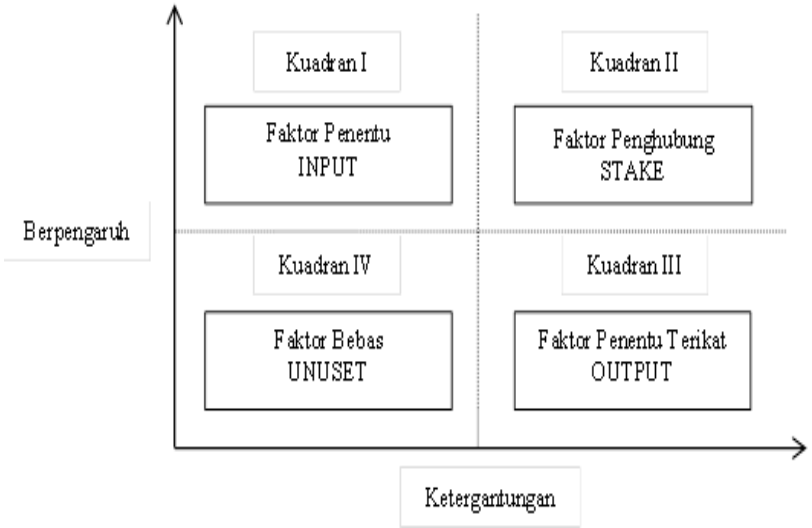

Figure 2 . The level of influence and dependence between factors in the system

RESULTS AND DISCUSSION

Influential Stakeholders in Floating Net Cage Reduction Dissemination Activities

Floating Net Cage reduction socialization was conducted in April 2018 with the aim of providing understanding to farmers and all elements involved in Floating Net Cage activities. The analysis results of the influential stakeholder in Floating Net Cage reduction socialization activities can be seen in Figure 3.

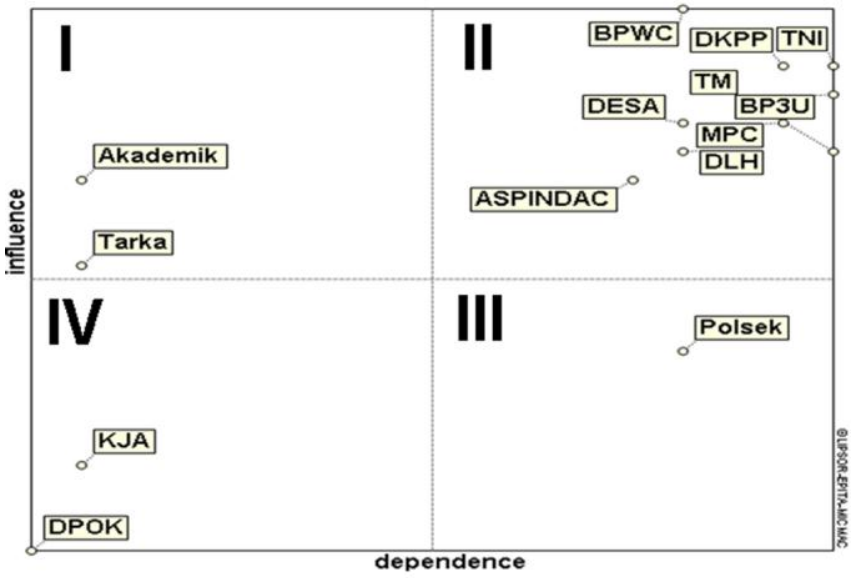

Figure 3 . MICMAC Analysis Results of Floating Net Cage Reduction Dissemination Activities

Information:

DKPP	:	Department of Marine, Fisheries and Animal Husbandry of Cianjur
BPWC	:	Cirata Reservoir Management Agency
DLH	:	Department of the Environment of Cianjur
DPOK	:	Department of Tourism , Youth and Sports of Cianjur
BP3U	:	Cianjur Fisheries and Water Conservation Center
Academic	:	Academic Parties
TNI	:	Indonesian National Armed Forces
Polsek	:	Cikalongkulon Sector Police
ASPINDAC	:	Cirata Reservoir Fish Cultivation Association
Village	:	Village officials
MPC	:	Cirata Community Care
TM	:	Community leaders
Tarka	:	Youth organization
KJA	:	Floating Net Cage cultivators

Stakeholders in quadrant I is Academic Parties. It has a strong activator power so that it can be a success factor that significantly affects the measurement. However, it has low dependence on

other factors. In the dissemination activities, the research of academic parties will be utilized to manage Cirata on its watering process and help to find other business prospect after the Floating Net Cage number is reduced.

Stakeholders in quadrant II are Cirata Reservoir Management Agency, Indonesian National Armed Forces, Department of Marine, Fisheries and Animal Husbandry of Cianjur, Department of the Environment of Cianjur, Cianjur Fisheries and Water Conservation Center, Cirata Community Care, Cirata Reservoir Fish Cultivation Association, village officials, and community leaders. These stakeholders have a strong driving force and dependency. In other words, these stakeholders are the key success in the socialization activity.

The Cirata Reservoir Management Agency as the manager in the socialization has the role of conveying the detail planned activities based on the current environmental conditions and giving understanding to the farmers that the Floating Net Cage reduction should be carried out since fish cultivation with Floating Net Cage system in Cirata does not have legal permission. The Indonesian National Armed Forces (KODAM, KODIM, KORAMIL and BABINSA) in the socialization activities delivers a series of activities and carry out security supervision. The Department of Marine, Fisheries and Animal Husbandry of Cianjur have a role as the coach for Floating Net Cage cultivators. They provide understanding to the farmers as well as the preparation of other alternative business that can be selected by farmers. Department of the Environment of Cianjur is a stakeholder who conducts research on pollutant sources from industries, households, and also from Floating Net Cages and regularly observes the quality of Cirata's water every 3 months. Then, the data from them will be handed over to the management or other stakeholders for a reference in taking further actions in the socialization. Department of the Environment of Cianjur also participates in delivering information on the state of the aquatic environment. Fisheries and Water Conservation Center act as the mouthpiece for the results of meetings conducted by the task force members to the farmers. They should also be ready to receive questions and complaints from the farmers regarding the floating net cage reduction program as the location of their office is near to Cirata Reservoir. In this dissemination activity, Cirata Community Care, Cirata Reservoir Fish Cultivation Association, youth organization, and community leaders act as the representatives of the farmers, so that they should reiterate the information given by stakeholders to the farmers. The socialization done through the farmer representatives is carried out with the aim of minimizing the occurrence of security problems. It is also expected that the information can be easily accepted if it is delivered by those who have more trust from the farmers. The village officials play a role in assisting other stakeholders who will discuss the Floating Net Cage reduction activities. Usually, if the community or cultivators feel a lack of information regarding the reduction of Floating Net Cages, the farmers will ask the village officials. Then, the village officials will prepare a meeting and contact the relevant stakeholders to hold a meeting and open a discussion session on the Floating Net Cage reduction program, so that people and farmers can receive direct information without confusion.

Stakeholders in quadrant III is Cikalongkulon Sector Police. They have weak driving forces, yet they have a strong dependence on other factors. In the socialization activities, the police do not play much role in delivering the activity plan. The Cikalongkulon police have a role in terms of security. If there are clashes or demonstrations, the police will intervene to stabilize the security condition.

Stakeholders in quadrant IV are Department of Tourism, Youth and Sports of Cianjur and Floating Net Cage cultivators. These stakeholders have a weak influence and dependence in the socialization activity. Department of Tourism is not listed in West Java Governor Decree Number 523.34./Kep.917-DKP/ 2017. Meanwhile, the Floating Net Cage cultivators do not have significant role in the socialization activities as they are the party that receives the socialization itself.

Stakeholders Role in Floating Net Cages Reduction Activities

The reduction of Floating Net Cages was carried out on June 19, 2018. Previously, the census process was carried out on the 8 May-11 June 2018. This reduction was carried out on week days (Monday-Friday) with the daily targets of 100 Floating Net Cages reduction in each location. The most prioritize operation target is the Floating Net Cage cultivators with the Floating Net Cages that exceeds the limit. The following is the result of MICMAC analysis on the influential stakeholders in the Floating Net Cages reduction activity.

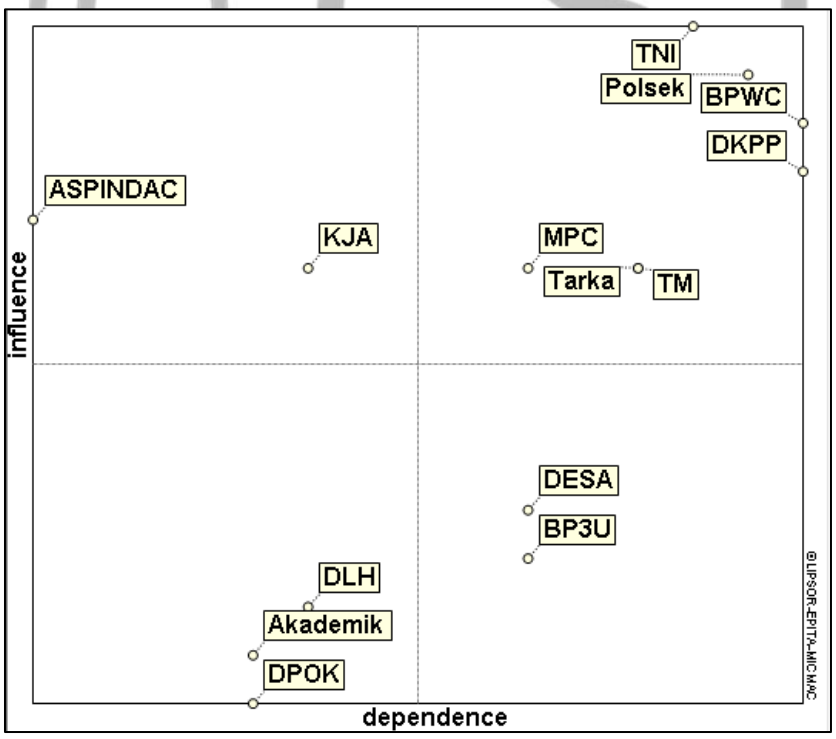

Figure 4. Results of MICMAC Analysis of Floating Net Cages Reduction Activity

Stakeholders in quadrant I are Floating Net Cage cultivators and Cirata Reservoir Fish Cultivation Association. They have no influence on the process of implementing Floating Net Cages reduction, but their characters and behaviors will affect the process of floating net cages reduction. Cooperative Floating Cage cultivators can help simplifying the process of the reduction, while the non-cooperative Floating Net Cages cultivators can obstruct the process of reducing Floating Net Cages.

Stakeholders in Quadrant II are Indonesian National Armed Forces (KODAM, KODIM, KORAMIL, and BABINSA), Cikalongkulon Sector Police, Cirata Reservoir Management Agency, Department of Marine, Fisheries and Animal Husbandry of Cianjur, youth organization, community leaders and Cirata Care Communities. These stakeholders have a direct effect on the floating net cages reduction. The Indonesian National Armed Forces, Cikalongkulon Sector Police, Cirata Reservoir Management Agency play a role in monitoring and assisting the process. They go to the ship and conduct negotiations. The community leaders, Cirata Community Care, and youth organization play a role in mentoring the cultivators. As Cirata Reservoir is very wide and the data held by the task force team is only the owners' name and the location of the Floating Net Cages, the task force team is assisted by the local community leaders. The data of the owners' name and the Floating Net Cages location can help showing the targeted Floating net cage cultivators places. In Floating Net Cages reduction activities, the experienced surrounding communities carry out the demolition process of the Floating Net Cages.

Stakeholders in Quadrant III are Cianjur Fisheries and Water Conservation Center and village officials. They do not participate in the demolition process, but they do the supervision. Cianjur Fisheries and Water Conservation Center and village officials are the government institutions closest to the farmers in Cikalongkulon, so the farmers' complaints or suggestions will be submitted to them. They will be the first government institutions taking over in resolving the conflicts.

Stakeholders in Quadrant IV are Department of Tourism, Youth and Sports of Cianjur, Department of the Environment of Cianjur, and academic parties. These stakeholders have no direct or indirect influence in the implementation of Floating Net Cages reduction. They will only get the progress report of the reduction activities and have an impact on the next management plan if the reduction has been completed.

Post Implementation of Floating Net Cages Reduction

The number of Fishery Households that utilize Cirata Reservoir to carry out cultivation with the Floating Net Cage system is 5139, with 540 Fisheries Households in the Cikalongkulon (BPWC 2018). This number does not include laborers; each owner with more than 5 Floating Net Cages units has at least 3-4 workers. The reduction affects not only the Floating net cage cultivators, but also all elements who work and do business in Floating Net Cages scopes, such as food entrepreneurs, feed workers, fish transport workers, and so on. In short, the reduction will

increase the number of unemployed people in Cianjur and will affect fish production in West Java and Jakarta

According to Sudrajat (2009), if reduction of fish floating cage farming is conducted, the government needs to provide solution for its substitute business field. Some alternative business fields related to fish floating net farming are: (1) fish hatchery business, (2) fish nursery business, and (3) feed making business, (4) fish processing business (fish fillet). Points (1), (2), and (3) can develop in Cianjur because until now, the input from this sector is largely imported from outside Cianjur.

The solution offered by the government to overcome the economic problems of the citizens and the fish production problem is by choosing the alternative businesses. The alternative businesses offered by the government are as follows:

A. Fisheries Sector
• Cultivation using the bioflok method
• Ground pond catfish
• CBF (Culture Based Fisheries)
• Hatchery and enlargement business (especially those who own land)
• Fish processing (smoked catfish, shredded catfish, smoked pagasius, fish jerky, etc.)
• Ornamental fish farming

B. Non-Fisheries Sector
• Entrepreneurship training
• Duck husbandry
• Quail husbandry

Stakeholders who will influence the business transfer plan are Department of Marine, Fisheries and Animal Husbandry of Cianjur as the coach for the cultivators and Cirata Reservoir Management Agency as the manager to develop the economic potency around the reservoir. The government has prepared the budget for developing the business transfer plan given to the Department of Fisheries in each regency. The budget funds come from the Provincial Government budget, District Government budget, and Special Budget Fund with the total number of 21.1 Billion for 3 regencies (BPWC 2018).

Floating Net Cages Reduction Strategy by Stakeholders

The initial strategy carries out by stakeholders in the reduction program is pulling up the unused Floating Net Cages. After that, regulating the ownership of Floating Net Cages is conducted. People who are allowed to have Floating Net Cages are only the native people of Cianjur proven by Citizens' Identity Cards. From the total of 540 Fisheries Households in Cikalongkulon, 301 of them own by foreigners or migrants (BPWC 2018). After that, the number of Floating Net Cages ownership is limited. Each Family Card (KK) is only allowed to have a maximum of 5 Floating Net Cages units. 1 unit consists of 4 plots. Therefore, each Family Card (KK) is only allowed to

have 20 floating net cages. Those who have more than 5 units should dismantle the excrescent number of their Floating Net Cages. However, the above strategy was canceled because there was a lot of fraud in the field. Fraud was done by owning more than 5 units using the name of another person in the ownership process, either the name of the worker or another family member. Another fraud done is making false Cianjur Identity Cards and false Family Cards. The cheating was initiated not only by the Floating Net Cage cultivators but the individuals in the licensing circles both in the related departments and others. Those frauds cause the overcapacity of Floating Net Cages in Cirata Reservoir.

Frauds cannot be avoided, so the stakeholders decide to form a new strategy, namely percentage strategy. Stage 1 is carried out in July-December 2018. Those who have 0-20 plots of Floating Net Cages should reduce 0% of them. Those who have > 20 up to ≤100 plots should reduce 20% of them. Those who have >100 up to ≤200 plots should reduce 25% of them and those who have >200 plots should reduce 30% of them. Stage 2 will be implemented in January-December 2019. Floating Net Cages will be equally regulated with the target of zero Floating Net Cages in 2023. Floating Net Cages reduction is carried out every day with the target of withdrawing 100 Floating Cages every day (BPWC 2018).

The percentage strategy is used so that the Floating Net Cage cultivators do not experience sudden economic changes while thinking about alternative businesses done when their Floating Net Cages business has completely ended. The zero floating net cage decision also creates pros and cons. This decision can make Cirata reservoir cleaner and support the activities of hydroelectric power plants since the water quality will be better. On the other hand, this decision can also eliminate the livelihoods of the people involved in the Floating Net Cage farming business.

According to Sudrajat (2009), the activity of freshwater fish farming with floating nets develops the economy of the area around the reservoir. The economic around the reservoir develops not only in the fish farming with floating nets sector, but also in other related and supporting sectors, such as the provision of fish seeds, good transportations, floating net infrastructures, and other sectors needed related to the existence of floating net pool. The development of those sectors has both direct and indirect linkage among the production sectors, which in turn results in the multiplication of floating fish aquaculture sectors to other sectors related to fish floating net farming.

According to Suryana (2013) Reduction of Floating Net Cage units that operate will affect the amount of production produced. The production produced by the sector itself will contribute to the value of Gross Regional Domestic Income. Therefore, the rationalization of the Floating Net Cages number will affect the amount of contribution to the Gross Regional Domestic Income of West Java fisheries.

Operational Recommendations

Socialization Recommendation

Recommended socialization activity that can be done is distributing invitation letters to attend socialization activities to all Floating net cage cultivators with the help of Cirata Community Care, community leaders, village officials and Cirata Reservoir Fish Cultivation Association. If the proper place is not available, socialization activities can be divided into some different days. It aims to do in-depth discussions between stakeholders and farmers, so that the purpose of the reduction can be understood by all related parties. By distributing invitations, every Floating Net Cage cultivators will feel involved in the activity and get the information directly from the related parties without any intermediaries that can cause misunderstanding in the information delivery process.

Implementation Recommendations

The decree on 2023 zero Floating Net Cage needs to be reviewed. According to Governor Decree No. 41 of 2002 article 2, a way to optimally improve the function and usability of the reservoir for variety possible interests without disturbing the main function of the reservoir itself is by providing opportunities for the local community to conduct fish cultivation with a quota of 12,000 plots.

The decision of 2023 zero Floating Net Cages is likely to be accepted if after zero number, Floating Net Cages are rebuilt with the following considerations:

- Floating Net Cages renewal: Currently, there are many environmentally friendly floating net cages. For example, Aquatec created by PT. Gani Artha Dwitunggal, a two-tier Floating Net Cages or layered Floating Net Cages, and other updates may be applied in Cirata Reservoir with the aim of minimizing pollution in Cirata Reservoir.
- Licensing in accordance with the rules
- Obeying the requirements for floating net cage cultivation as determined by Governor Decree No. 41 of 2002

Post-Implementation Recommendations

Alternative business offered by the government can be carried out well if there is seriousness from all related institutions with the aim of returning the economic status of the farmers and there is sufficient funding to carry out the business transfer. It is expected that there will be cooperation between all parties involved to create business transfers that are in accordance with the interests of the surrounding community. Other efforts that might be developed for affected people are managing fisheries in Cirata Reservoir, developing Cirata Reservoir as tourism area, and empowering community by processing water hyacinth into something that can generate rupiah and others.

Prospective Analysis of the Floating Cages Reduction Strategies in Cirata Reservoir

Three steps needed in prospective analysis are; identifying the future determinants, determining the strategic objectives and main actors' interests, defining and describing possible future evolution (Bourgeois 2004).
The determinant factors that will make the Floating Net Cage reduction program success are as follows:

Table 2. Prospective Analysis of Floating Net Cage Reduction Strategies

Determinant factor	Interests	Strategy in the future
Cirata Reservoir Management Agency	Managing, maintaining, and developing economic potential in Cirata Reservoir.	Socializing with the community and having an active role in the business transfers planning that will be carried out by the farmers as well as supervising the Cirata Reservoir utilization
Department of Marine and Fisheries of West Java Province and Cianjur Regency	Absorbing labor in their regions as well as planning, organizing, implementing and monitoring / evaluating fisheries activities	Being able to plan the next fishery management, coaching, providing financial assistance and supervising management of fishery resources in Cirata Reservoir after the reduction of Floating Net Cage is conducted.
Public Fisheries and Water Conservation Center	Handling technical activities in Floating Net Cage cultivators management and coaching activities	Being the closest information source for the cultivators. Being expected to be able to provide clear information so that there is no information gap causing conflicts between stakeholders and farmers
Indonesian National Armed Forces and Cikalongkulon Sector Police	Guiding, protecting, and supervising the community in terms of safety and security	Being fair, act without using violence and not pushing the farmers in all floating net cages reduction activities
Kamurang and Gudang villages officials	Managing, developing rural areas, protecting and guiding the community of Kamurang and Gudang villages	Helping other stakeholders in providing infrastructure for all activities done for the people of Kamurang and Gudang villages, supporting business transfer activities planned by the government, and assisting other stakeholders in supervising fisheries activities

Determinant factor	Interests	Strategy in the future
Cirata Community Cares	Realizing the implementation of the Cirata Reservoir management master plan, and optimizing the role of stakeholders, entrepreneurs and the community in Cirata Reservoir utilization	Being a good information bridge between stakeholders, especially BPWC, and farmers and being expected to make the reservoir management and supervision easier
Floating Net Cage cultivators and Cirata Reservoir Fish Cultivation Association	Livelihoods in fisheries activities	Being cooperative in all government activities and being expected to follow the government guidelines in carrying out the prepared business transfer activities and to save the environment

According to Ummah (2015), better Cirata Reservoir management can be realized by strengthening the coordination among the involved stakeholders. The existing regulations have sufficiently covered the needs in Cirata Reservoir. However, there are lack implementation and enforcement of the regulations. Clear tasks division between reservoir management, related departments, and local community groups is needed in managing the reservoirs. The existing sanctions also need to be more enforced.

CONCLUSION

The most influential stakeholders in reducing Floating Net Cage number in Cikalongkulon are the stakeholders in quadrant II. The influential stakeholders in the socialization activity are Cirata Reservoir Management Agency. In the implementation of the Floating Net Cage reduction, Indonesia National Armed Forces (KODAM, KODIM, KORAMIL, BABINSA) is the most influential stakeholder. Meanwhile, in the post implementation of the Floating Net Cage reduction, Department of Marine, Fisheries and Animal Husbandry of Cianjur is considered as the most influential stakeholders.

The strategy for Cirata *Zero* Floating Net Cage in 2023 needs to be reviewed as it affects fish farming with floating nets sector and other supporting sectors. The strategy for reducing the Floating Net Cage number can refer to the Governor's Decree No. 41 of 2002 by developing new Floating Net Cage technology to minimize the pollution in Cirata Reservoir. Strict monitoring should also be done in order to avoid overcapacity by strengthening coordination between the involved stakeholders.

ACKNOWLEDGMENT

We would like to thank the Faculty of Fisheries and Marine Sciences, Padjadjaran University, Indonesia for making this research possible

REFERENCE

[1] Badan Pengelola Waduk Cirata (BPWC). 2018. Pemaparan Progres Penertiban & Penataan KJA di Waduk Cirata. Bandung Barat : BPWC
[2] Bourgeois, R. 2004. Participatory Prospective Analysis. Exploring and Anticipating Challenges with Stakeholders. UNESCAP-CAPSA. Trough Secondary Crop's Development in Asia and Fasipic. CAPSA Monograph No.46.
[3] Oktaviani, D.A. 2015. Status Keberlanjutan Pengelolaan Waduk Cirata Jawa Barat. *Skripsi*. Departemen Ekonomi dan Lingkungan. Institut Pertanian Bogor, Bogor.
[4] Siyoto, S dan Sodik, M.A. 2015. *Dasar Metodelogi Penelitian* Yogyakarta: Literasi Media Publishing.
[5] Sudrajat, M. 2009. Dampak Budidaya Ikan Jaring Apung Di Waduk Cirata Terhadap Kesejahteraan Masyarakat Sekitar Lokasi Dan Pembangunan Ekonomi Kabupaten Cianjur. *Tesis*. Departemen Ekonomi dan Lingkungan. Institut Pertanian Bogor, Bogor.
[6] Sugiyono. 2016. *Memahami Penelitian Kualitatif*. Bandung: Penerbit CV Alfabeta.
[7] Suryana, A.A.H. 2013. Dinamika Total Factor Productivity Perikanan Budidaya Air Tawar Dan Dampakya Terhadap Perekonomian Jawa Barat. *Disertasi*. Sekolah Pasca Sarjana. Institut Pertanian Bogor, Bogor
[8] Ummah, N.W. 2015. Analisis Kelembagaan Dalam Pengelolaan Karamba Jaring Apung (KJA) Waduk Cirata. *Skripsi*. Departemen Sumberdaya dan Lingkungan. Institut Pertanian Bogor, Bogor
[9] Zahidah, 2004. Evaluasi Kelayakan Kualitas Air untuk Budidaya Ikan dalam Karamba Jaring Apung di Waduk Cirata. Laporan Penelitian. Fakultas Perikanan dan Ilmu Kelautan UNPAD.