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Polarization of Stakeholder orientation in the management of *Kawah Kamojang* forest area towards optimizing sustainable benefits

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Abstract
Polarization orientation of stakeholders in the use of a forest area is not only going to potentially be the cause of the poor performance of collaborative works, but is also potentially a source of serious conflict that led to the destruction of forests. A study of orientation polarization among stakeholders becomes important in the management of *Kawah Kamojang* Forest Area (KKFA) due to several reasons: a) The complexity of forest functions and the rules regulating its utilization; b) The large number of stakeholders involved; and c) the emerging symptoms of the forest quality degradation year by year. In this study, data on stakeholder orientation were obtained through close-ended questionnaires, while stakeholder orientation is mapped by constructing resultant matrices followed by F-test and post-hoc test. The stakeholders under study are divided into seven, namely: Laksana Village Community (LVC), Sukakarya Village Community (SVC), Bandung Regency Government (BRG), Garut Regency Government (GRG), West Java Office for Natural Resources Conservation (Balai Besar Konservasi Sumberdaya Alam/BBKSDA), Perum Perhutani (State-Owned Forestry Enterprise), and Non-Governmental Organizations (NGOs). In terms of biophysical, economic, socio-cultural aspects, the results of the study reveal that stakeholder orientation is polarized into two, namely: (1) the village communities, and (2) a combination of BRG-GRG-BBKSDA-Perhutani-NGOS. Meanwhile, stakeholder perceptions of management are polarized into four: (1) the village communities, (2) the regional governments; (3) BBKSDA-Perhutani, and (4) the NGOs, where the stakeholders tend to positively respond to the activities held by the managing authorities of the area. Polarization is also observed in stakeholder motivations to utilize the KKFA, in which the communities are inclined towards daily economic interest, while the regional governments towards meeting the regional real incomes (PAD), and the managing authorities and NGOs insist on area sustainability. Hence, the study has demonstrated that the polarization of stakeholder perceptions and motivations in the management and utilization of a certain forest area does not only suggest that there is conflict of interest among the stakeholders, but it can potentially cause disorientation and inefficiency as well as ineffectiveness in the development of the KKFA.

Keywords: Orientation Polarization, *Kawah Kamojang*, Perceptions and Motivations

1. Introduction
In the process of development, polarization of stakeholder orientation do not only trigger intergroup conflict in terms of natural resource management and utilization, but also cause the exploitation of the natural resources to be less optimal. According to Moscovici & Zavalloni (1969: 125), group polarization is a symptom of the inclination of a group's opinion towards a certain view. Meanwhile, Aronson et al., (2013:255) defined polarization as a group's tendency to make a decision that is more extreme than the initial tendency of its members. Then, it can be inferred that in a group communication, polarization is a polarizing process, both oriented at the supporting/positive/pro and opposing/negative/contra sides of a problem under debate. The triggering factor for group polarization is rooted from social disparities, where each party tends to think that it is better and more frequently "right" than other groups.
Polarization can have negative implications. First, it evokes a tendency towards extremism that can create more possibilities to make mistakes. Second, polarization will encourage extremism in a social or political movement, where the group will commonly recruit members who share the same view in order to build greater power. The tendencies can result in serious consequences, where if the group unites with another group, the newly formed group will take a more radical stance compared to before the unison.
A party tend to have bolder decisions precisely when they are in a group instead of outside the group. According to Basyaib (2006: 261), the phenomenon is known as risk shifting theory.

The theory explains that the amalgamation of individuals into a group of decision makers in an uncertain situation tends to result in a more risky decision compared to the decision made by the members separately. In group polarization, a party can take the stance of somewhat supporting a certain action, where after uniting with another party, the two will become even stronger in supporting the action. Contrarily, if before unison a certain party somewhat opposes a certain action, after unison the party will oppose the action even more strongly. Generally, the effects of polarization are limited to relatively important issues. If the developing issues do not really matter, depolarization may still take place, but in general, the phenomenon is not very extreme.

In the context of Indonesian forest management, the dynamics of group polarization has become an important and "sexy" issue in the last three decades. Until recently, forest conservation generally has focused on the ecological aspects and not really taken into account the economic and social aspects. This phenomenon has caused polarization in stakeholder perceptions of forest and their motivations in utilizing its resources. Stakeholders' disparate interests in forest utilization have caused Indonesian forest management to be less optimal, and this conflict of interest has even been suspected to be the cause of forest destruction. Meanwhile, forests should be viewed as capital, production factor, ecosystem, and space, so that they will provide optimal benefits to the completely interested parties.

Weeks and Packard (1997: 243) stated that the majority of protected forest management has ignored community's traditional exploitation as a means of sustaining natural diversity, namely by preferring more to conserve without engaging local communities and tending to block communities' access to the natural resources. This is what can lead to conflict between communities or others with the management. According to Gbadegesin and Ayileka (2000: 90), although the protective approach is useful as a means to protect many forests with protective functions, it has failed to take into account the village communities' interest, especially because the communities are not involved in the decision making related to resources.

The above symptoms of failed forest management are also found in *Kawah Kamojang* Forest Area (KKFA) located in between Bandung Regency and Garut Regency. Until currently, the KKFA has been included under the category of a forest area undergoing destruction as well as declining quality and forest area. The degradation is inseparable from polarization of the stakeholders' perceptions and motivations of KKFA. The functions of the KKFA can be classified into two, namely Protected Forest (PF) managed by Perhutani and Conservation Area (CA) divided into Natural Conservation (NC) and Nature Park (NP) managed by West Java Office for Natural Resources Conservation (BBKSDA). In its management, there are a large number of policies that contradict each other or lack synchronization, assumed to have originated from various point of views and ways of managing the forest in the KKFA, both among managing authorities and other stakeholders. Besides West Java BBKSDA and Perhutani, interested stakeholders are the communities around the area and the local government.

Waryono (2008: 7) reported that the division of the forest area into conservation area and protected forest at the level of policy implementation has created a contradictory dichotomy, thereby swerving further away from the concept of sustainable forest management. The Discrepancies in the views and ways of managing the forest have caused the forest area to seem to be under separate management, in line with the implementation of restriction of forest functions and the authorized managing institution. In addition, the lack of engagement of other stakeholders (both local government and communities) has further caused the emergence of sectoral ego in the area management. All of these issues have caused the exploitation of forest resources in the KKFA to be less than optimal.

Partial management and the lack of other stakeholders' involvement in the KKFA have caused various problems in the forest. For example, the total area experiencing deforestation in *Kawah Kamojang* Nature Conservation until 2010 has reached 736.5 Ha (BBKSDA of Garut Area, 2013). On the other hand, the management of *Kawah Kamojang* Nature Park gives an impression of being managed solely by the management and leaving a very small room for the regional government, business people, and local communities to participate. Such management system has caused the local government and communities to be apathetic, and some of the communities even protest against various forms of forest conservation in the area.

One of the causing factors of the gap in the management orientation is certainly inextricable from the perceptions and motivations of the stakeholders of the forest area. According to Kotler (1999: 246), perception is a process by which an individual selects, organizes, and interprets information inputs to create a meaningful description of the world. It is explained that individuals' different perceptions of a similar stimulating object is resulted from three processes related to perception, namely selective attention, meaning change, and selective memory.

Meanwhile, Wade and Travis (2002: 193) defined perception as a group of mental actions regulating sensory impulses into a meaningful pattern. Perception ability is something that is inherent in nature and develops at a very early age. Although perception range is commonly inherent, experience also plays similarly important roles. Inherent abilities will not survive because the cells in the nerves experience setbacks, change, or fail to form appropriate nervous tracks. Moreover, it is emphasized that as a whole perception ability is cultivated and influenced by experience. On the other hand, Krech et al., (1977: 235) mentioned that perception is affected by functional, structural, situational, and personal factors. Functional factor refers to the factor originating from the needs, past experiences, and personal aspects. Structural factor is a factor rooted in individual nervous system. Situational factor is one related to nonverbal language, and finally situational factor is linked to experience, motivation, and personality. Thus, it can be concluded that perception is a process of organizing and interpreting stimulation influenced by various types of knowledge, desires, and experiences relevant to the stimulation and affected by human behavior in making a decision for his or her life.

In addition to perception, stakeholder motivation on the forest becomes an equally important factor in order to achieve uniformity in action among them. Motivation is the internal power causing one to do an action. It is inseparable from individuals' behaviors and desires according to their respective culture. Wahjosumidjo (1987) explained that motivation is anything that is verbal, physical, or psychological that makes one do something as a response, and it is a psychological process that reflects interaction among attitude, needs, perception, and decision occurring in one self.

According to Franken (1982), studies of motivation have frequently been linked to arousal theory, direction, and

persistence of behavior. The theory of Hierarchy of Needs pertaining to motivation put forward by Maslow (1943: 370-396) can be used to predict one's behaviors in a group or organization and how to manipulate or form the behaviors in order to meet his or her needs. The theory references two foundations, namely the fact that humans always have the need to develop and progress and humans always attempt to meet their primary needs first before trying to meet other needs. The highlight in Maslow's notion is the motivation for the needs already met (partially or in whole) will stop, and then the motivation will move to the efforts of meeting other higher needs. Through observation of group members' behaviors and by relating the behaviors to the levels of needs, other members or the group leader in an attempt of forming an apt group can do a certain action.

Considering the above explanations, the polarization of stakeholder orientation becomes significant to be researched in the KKFA. This urgency is not only in line with the conservation and protection function of the area as well as the variety of related stakeholders, but also the great potentials of this forest to be made, for instance, natural tourist destination and geothermal power source. Hence, the research is conducted to find stakeholder perceptions of and motivations for the benefits and services as well as management of the KKFA. The research results are expected to be made input for the management and stakeholders, ultimately in improving the management of KKFA towards optimal sustainable benefits.

2. Research Method

2.1 Research Location

The research location covers 14,656.46 hectares of *Kawah Kamojang* Forest Area. It consist of protected forest with an area of 6,120.01 ha (managed by Perum Perhutani Unit III of West Java for Garut and South Bandung Regions) and Natural Conservation area with an area of 7,805 ha; *Kawah Kamojang* Nature Park with an area of 481 ha, and Mount Guntur Nature Park with an area of 250 ha, (managed by West Java BBKSDA). Administratively, the research location is situated in Garut Regency and Bandung Regency, while geographically it is located at the coordinates of $107^0$42' - $107^0$52' East Longitude and $7^0$6' - $7^0$12' South Latitude.

Questionnaires were distributed to Laksana Village Community (LVC) located in Bandung Regency and Sukakarya Village Community (SVC) in Garut Regency. These two villages were selected as research locations based on their proximity to the most intensively utilized forest area, both for natural tourist destination and geothermal power source. Meanwhile, the research was conducted from February 2014-October 2014 for field data collection, and from November 2014-December 2014 for data analysis.

2.2 Assessment of Indicators

In this research, data on stakeholder orientation (in the forms of perceptions and motivations) were gained through close-ended questionnaires, where each of the respondents was given an opportunity to select more than one answer, and then they had to provide scores for each of their answers. The scoring used Likert Scale that has been extended from 1-5 into 1-7 scale, and it applied One Score-One Indicator Scoring system that introduced by Avenzora (2008: 250b); in which the main point of One Score – One Indicator Scoring System is that for each given score there should be one independent indicator. The number of sample for each type of stakeholders was 30 respondents, where the respondents from the communities were selected randomly from the heads of household in each of the villages. Essentially, the content of the questionnaire is as displayed in Table 1.

Table 1: Matrix Questions for stakeholder perceptions and motivations in terms of biophysical, economic, and cultural aspects

Aspect		Stakeholder						
		1	2	3	4	5	6	7
Perception								
1. The benefits and services of the forest in KKFA	Biophysical	x	x	x	x	x	x	x
	Economic	x	x	x	x	x	x	x
	Socio-Cultural	x	x	x	x	x	x	x
2. Types of management activities conducted by the authority of the forest area in KKFA	Biophysical	x	x	x	x	x	x	x
	Economic	x	x	x	x	x	x	x
	Socio-Cultural	x	x	x	x	x	x	x
3. The utilization in the form of natural park in *Kawah Kamojang* Natural Park	Biophysical	x	x	x	x	x	x	x
	Economic	x	x	x	x	x	x	x
	Socio-Cultural	x	x	x	x	x	x	x
4. The utilization in the form of natural park in Situ Cibeureum Tourism Object	Biophysical	x	x	x	x	x	x	x
	Economic	x	x	x	x	x	x	x
	Socio-Cultural	x	x	x	x	x	x	x
5. The utilization in the form of geothermal power source	Biophysical	x	x	x	x	x	x	x
	Economic	x	x	x	x	x	x	x
	Socio-Cultural	x	x	x	x	x	x	x
Motivation								
1. Utilizing forest resources	Biophysical	x	x	x	x	-	-	x
	Economic	x	x	x	x	-	-	x
	Socio-Cultural	x	x	x	x	-	-	x
2. Managing forest resources	Biophysical	-	-	-	-	x	x	-
	Economic	-	-	-	-	x	x	-
	Socio-Cultural	-	-	-	-	x	x	-

Notes: 1 = Laksana Village Community (LVC), 2 = Sukakarya Village Community (SVC), 3 = Government of Bandung Regency (GBR), 4 = Government of Garut Regency (GRG), 5 = West Java BBKSDA, 6 = Perum Perhutani Unit III of West Java, 7 = NGOs.

The data were processed by summing up the frequency of each score given by the stakeholders in answering to each of the criteria and indicators in question. Then, the related Likert Scale score multiplied the frequency of each indicator, so that an indicator score was gained. This indicator score was totaled to gain cumulative score and then counted for its average. The average score was then inserted into stakeholder polarization matrices in order to see the occurring polarization and the quadrant position. Meanwhile, the polarization matrices of perceptions and motivations were constructed from the intersection of biophysical-economic, biophysical-socio-cultural, and economic-socio-cultural lines. Finally, for the perceptions of the ongoing utilization, the polarization matrix is built from the intersection of positive and negative perception lines.

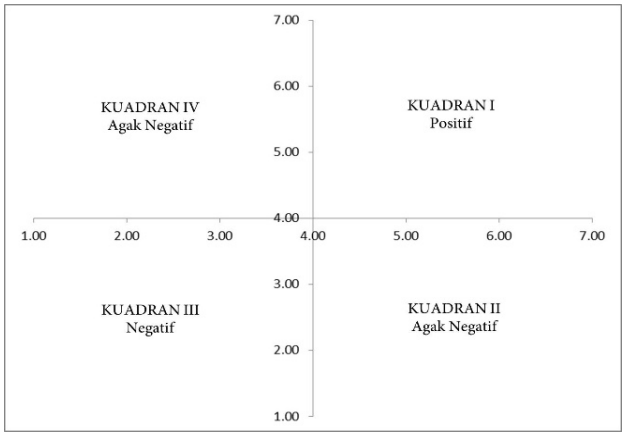


Fig 1. Polarization Matrix

The next process was to prove that there was polarization among stakeholders, so the score from each stakeholder was analyzed through One Way ANOVA or F-test and post-hoc test (Ogden & Lo, 2011: 7) to test the mean difference of more than two samples. One Way ANOVA assumes that the population to be tested is normally distributed; variance of the population is similar; and sample is not related to each other. The significance value was determined to be 5% or 0.05. The formulation of F-test is as follow:

$$F = \frac{Variance\ in\ sample}{Variance\ among\ samples}$$

In this research, the following hypotheses were made:

- H_o = there are no differences in the scores assigned by stakeholders.
- H_1 = there are no differences in the scores assigned by stakeholders.

The hypotheses were built based on the following considerations:

1. If $F_{count} < F_{table}$, H_o is accepted, or $P_{value} \geq \alpha$ ($\alpha = 0{,}05$) then H_o is accepted, meaning that there are no significant differences among stakeholders or there is no polarization across groups of stakeholders.
2. IF $F_{count} > F_{table}$, H_o is rejected, or $P_{value} < \alpha$ ($\alpha = 0{,}05$), then H_o is rejected, translated as there are significant differences among stakeholders or there is polarization across groups of stakeholders.

3. Results and Discussion

3.1 Stakeholder Characteristics

The *Kawah Kamojang* Forest Area is administratively situated under two different regional governments, namely Bandung Regency and Garut Regency. The area is surrounded by 29 buffer villages, including Laksana Village in Bandung Regency and Sukakarya Village in Garut Regency that have been selected as the research locations. Both villages were selected based on their proximity to the most intensively utilized forest area, both for natural tourism and geothermal source. The Laksana Village, which is immediately adjacent to *Kawah Kamojang* Nature Park, is the site of the management office of PT. Pertamina Geothermal Energy (PT. PGE). Meanwhile, Sukakarya Village, the neighboring village, has collaborated with PT. Perhutani in managing Situ (Lake) Cibeureum ecotourism within the protected forest. Considering their strategic locations, the two villages are among the working areas of PT. Pertamina Geothermal Energy (PT. PGE) and are frequently involved in the forest management activities. The Laksana Village is inhabited by 213 households, with a total population of 7,358 people. Meanwhile, Sukakarya Village has 7,080 inhabitants, with 2,018 households. Most of the residents of these two villages, i.e. 60-70%, are farmers, with elementary school education level. The main crops they produce are corn, rice, chilies, tomatoes, cabbage, bananas, tobacco, and coffee. Moreover, Sukakarya Village is Garut's major producer of *akar wangi* (scented roots), which are the basic ingredient for essential oil.
The forests in *Kawah Kamojang* area have two legal statuses, namely as protected forest and conservation forest. Perum Perhutani, a state-owned forestry company, Unit III West Java, manages the former, whereas the latter is under West Java Office coordinates the authority of Indonesian Ministry of Forestry and the management for Natural Resources Conservation (BBKSDA). With respect to conservation forest, it covers *Kawah Kamojang* Natural Conservation (KKNC) and *Kawah Kamojang* Nature Park (KKNP).
The management of KKNC and KKNP is under the Regional Conservation Section (Seksi Konservasi Wilayah/SKW) V Garut, BBKSDA of West Java. The section has 41 employees: 16 members of financial and administrative staff and 25 members of functional staff (22 police rangers, one forest ecosystem controller and two field extension staffs). In terms of education levels, two employees are S1 (equivalent to bachelor degree) graduates, four employees are D3 (equivalent to associate degree) graduates and the rest are high school (SMA/SMP) graduates. Two different units under Perum Perhutani, namely Garut and South Bandung Management Units manage the protected forest in KKFA. The protected forest in Garut becomes the responsibility of Leles and Tarogong Local Forest Management Unit (Kesatuan Resort Pemangkuan Hutan/KRPH), while that in Bandung is the responsibility of KRPH of Pacet and Mandalawangi.
In addition to the communities and managing authority, the parties most interested in KKFA are the Government of Garut Regency (GGR) and the Government of Bandung Regency (GBR). In this regard, the departments that have intersectional interest in KKFA are Regional Development Planning Agency (Badan Perencanaan Pembangunan Daerah/Bappeda), Forestry Department, Tourism Department, Department of Water and Mining Resource (Dinas Sumber Daya Air dan Pertambangan/SDAP). Increased regional real income is one of the underlying reasons for the regional governments' involvement in the utilization of the natural resources in KKFA.

3.2 Stakeholder Perceptions

a. Stakeholder Perceptions of KKFA Benefits and Services

The results presented in Figure 2a indicate that there are diverse perceptions among stakeholders concerning the

benefits and services provided by KKFAA. In general, the stakeholders have positive opinions about the biophysical, economic, and socio-cultural aspects of the benefits and services of KKFA as shown by how the perceptions are pooled in Quadrant I.

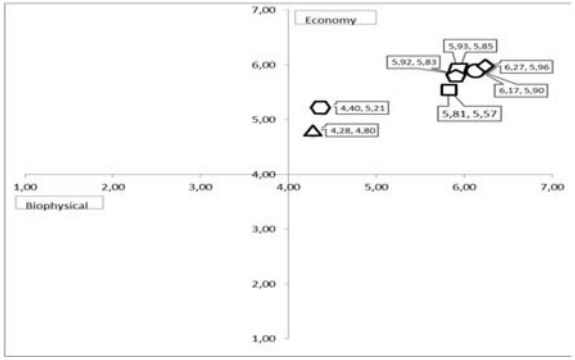
Polarized Perceptions of the benefits and services of the Protected Forests. The findings suggest that the perceptions of the benefits and services of the protected forests, with regard to biophysical, economic and socio-cultural aspects form two polarized opinion groups. The groups are: (1) the local communities, i.e. Laksana Village Community (henceforth, LVC) and Sukakarya Village Community (henceforth, SVC); and (2) the managing authorities (BBKSDA and Perhutani), local governments (GRG and BRG), and NGOs. The polarization is proven by the results of the F-test which showed statistically significant differences in all aspects: biophysical aspects [$F_{count}(50.38)>F_{table}(2.14)$], economic aspects [$F_{count}(7.93)> F_{table}(2.14)$] and socio-cultural aspects [$F_{count}(22.93)>F_{table}(2.14)$].

The diverse perceptions among the local communities are, most likely, a result of their lack of knowledge about forest benefits and services. The local people's knowledge is limited to the process of water catchment and prevention of landslides. It appears that this condition occurs because they have not received knowledge through extension and development programs about the impacts of forest on society. In line with this, a study conducted by Ling et al., (2011: 264) in Penang-Malaysia, found that environmental knowledge correlates with level of environmental impacts perceived by local people. It is explained that when local people have low environmental knowledge, they will not be able to realize the impacts or benefits perceived. Luckily, in the case of the present study, the perceptions of the stakeholders are positive, as indicated by the distribution of the perceptions, which are concentrated in Quadrant I.

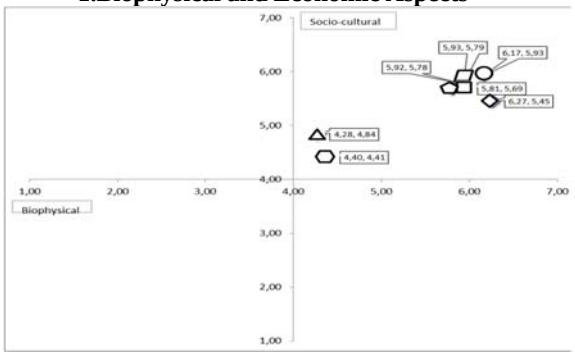
Polarized Perceptions of Natural Conservation Benefits and Services. The findings show that the stakeholders' perceptions of KKNC benefits and services (Figure 2b) also form polarized opinion groups: (1) village administrative governments; and (2) BBKSDA, Perhutani, GRG, BRG, and NGOs. This is proven by the F-test which also indicated significant differences in perceptions in all aspects: biophysical aspects [$F_{count}(27.56)>F_{table}(2.14)$], economic aspects [$F_{count}(41.61)>F_{table}(2.14)$], and socio-cultural aspects [$F_{count}(28.99)>F_{table}(2.14)$]. A concentration of perceptions (of all the aforementioned parties) in Quadrant I suggests that the stakeholders perceive the benefits and services of the natural conservation positively.

Polarized Perceptions of Nature Park Benefits and Services. A concentration of perceptions in Quadrant I (Figure 2c) suggests that the stakeholders have relatively positive opinions about KKNP benefits and services. The stakeholders' perceptions form four diverse opinion groups: (1) village administrative governments; (2) BBKSDA, GRG and BRG; (3) Perhutani; and (4) NGOs. The results of the F-test also indicated significant differences in perceptions in terms of biophysical aspects [$F_{count}(42.55)>F_{table}(2.14)$], economic aspects [$F_{count}(42.55)>F_{table}(2.14)$], and socio-cultural aspects [$F_{count}(85.44)]>F_{table}(2.14)$]. It is more than likely that differences in the way Perhutani and other stakeholders view the benefits and services of the Nature Park result from PT Perhutani's perception that the Nature Park provides less benefits and services (especially in terms of water resources) because the area is relatively small.

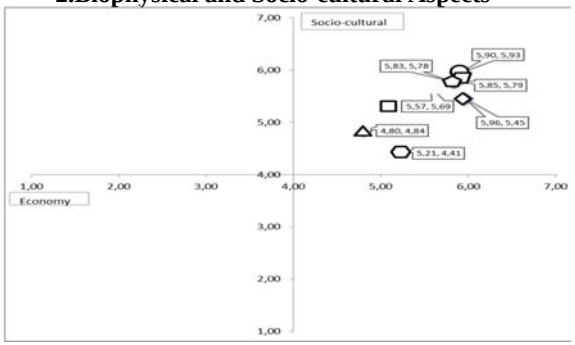
a. Protected Forest



1.Biophysical and Economic Aspects

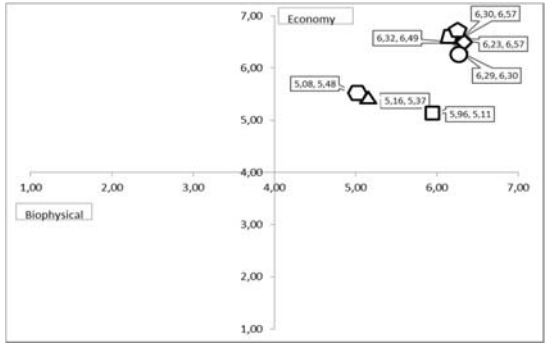


2.Biophysical and Socio-cultural Aspects

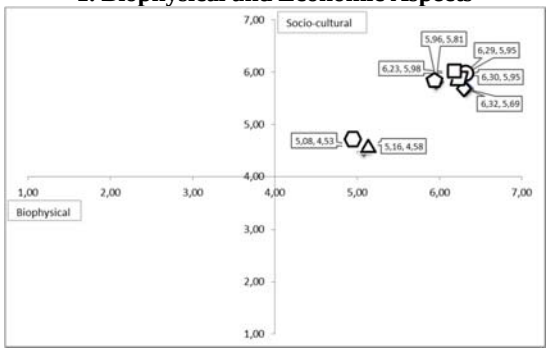


3.Economic and Socio-cultural Aspects

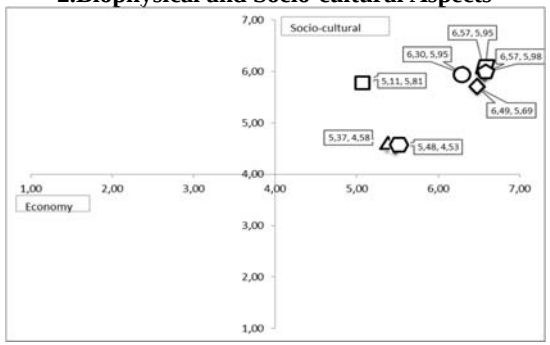
a. Natural Conservation



1. Biophysical and Economic Aspects

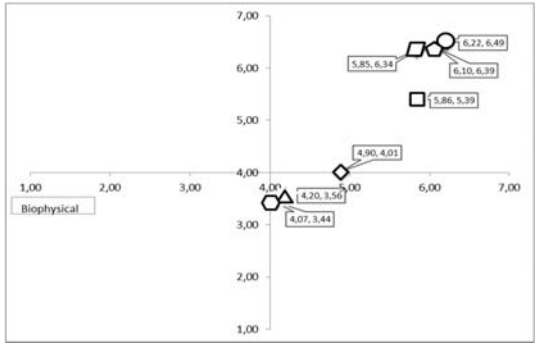


2.Biophysical and Socio-cultural Aspects

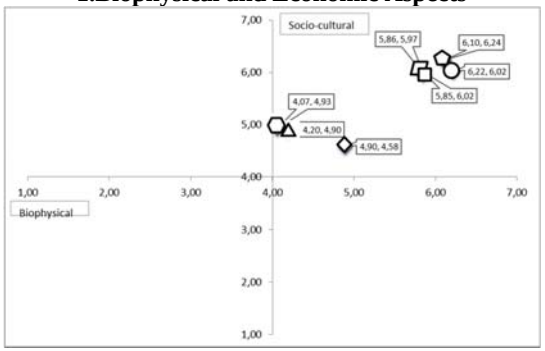


3. Economic and Socio-cultural Aspects

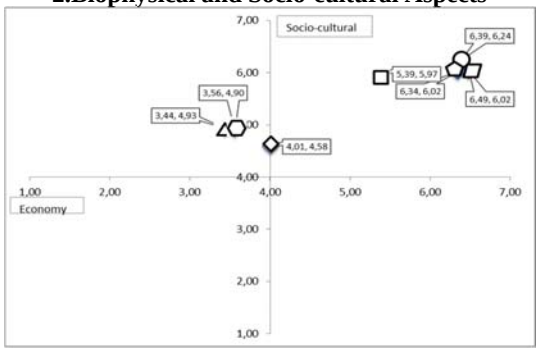
a. Nature Park



1.Biophysical and Economic Aspects



2.Biophysical and Socio-cultural Aspects



3. Economic and Socio-cultural Aspects

Description of Symbols: : Laksana Vil. Com. : Garut Government : Sukakarya Vil.Com. : BBKSDA West Java : Bandung Government : Perhutani : NGOs

Fig 2. Stakeholder polarized perceptions of KKFA Benefits and Services

The rather negative perceptions held by the local community (in Quadrant IV in terms of biophysical and economic aspects, as well as in Quadrant II in terms of socio-cultural aspects) may result from a lack of opportunity for utilizing non-wood forest products from KKFA. On the other hand, BBKSDA, GRG and BRG as well as NGOs perceive the benefits and services more positively. They agree that the existence of the Nature Park can provide benefits and services that cover all aspects, such as: stabilization of micro- and macro-climate (biophysical aspects); provision of food, germplasm, medicines and water (economic aspects); and purveyance of knowledge and local wisdom, values, inspiration and aesthetic beauty (socio-cultural aspects).

b. Stakeholder Perceptions on the Authority Management Activities

Polarized Perceptions of Protected Forest Management. The findings show positive perceptions of the management of the protected forest (Figure 3a). The positivism is evident from the stakeholder perceptions, which are concentrated in Quadrant I, meaning that the resulting perceptions are relatively positive. The perceptions form four diverse opinion groups: (1) RVC; (2) SVC; (3) NGOs; and (4) the managing authority and local governments. The F-test results indicated significant differences in perceptions in all aspects: biophysical aspects [$F_{count}(5.80)>F_{table}(2.14)$], economic aspects [$F_{count}(12.15)> F_{table}(2.14)$], and socio-cultural aspects [$F_{count}(2.59)> F_{table}(2.14)$]. The distribution of SVC perceptions, which tend to cluster within Quadrant II (especially with respect to the biophysical-economic aspects and biophysical-socio-cultural aspects) may suggest that the people are not yet satisfied with the management of Perhutani (particularly with respect to biophysical aspects). Meanwhile, SVC evaluates Perhutani's management as poor concerning the protection of essential ecosystems, preservation of rare plant and conservation of animal species in the protected forest.

Polarized Perceptions of Natural Conservation Management. The findings suggest positive perceptions of the management of the natural conservation area (Figure 3b). This can be seen from a concentration of the stakeholder perceptions in Quadrant I, meaning that the perceptions are relatively positive.

The findings show that the stakeholder perceptions of the natural conservation management (Figure 3b) form three opinion groups: (1) the local communities, (2) local governments and NGOs, and (3) the managing authorities. The following are the results of the F-test done on the three aspects: (1) biophysical aspects [$F_{count}(23.32)>F_{table}(2.14)$]; (2) economic aspects [$F_{count}(10.73)>F_{table}(2.14)$], and socio-cultural aspects [$F_{count}(5.80)> F_{table}(2.14)$]. The results prove that there were significant differences in the ways the stakeholders assessed BBKSDA's management of the nature reserve, with regard to all aspects. A concentration of the residents' perceptions in Quadrants II and IV can be a sign that the management policies adopted by BKSDA have not accommodated the interests of the local communities; particularly when it comes to non-wood forest product utilization (food, medicinal plants and ornamental plants) and ecotourism business planning (Situ Ciharus).

The field observation reveals that some residents often steal resources from the natural conservation area. Moreover, some residents also work as 'unofficial' tour guides and set up kiosks/ stalls on Situ Ciharus area. If the situation remains this way, the damage in the natural conservation may spread and become uncontrollable. Therefore, the people should be given continuous counseling regarding the functions of each forest area. In addition to that, innovations in programs are required in order to accommodate the residents' activities in KHKK, such as allocating the residents utilization areas in which they can gain economic benefits. Meanwhile, BBKSDA programs and actions are positively appreciated and are assessed as useful for the natural conservation sustainability by the local governments, the managing authorities (BBKSDA and Perhutani), and NGOs, as is evident from a concentration of perceptions in Quadrant I.

Polarized Perceptions of Nature Park Management. With respect to the management of the Nature Park (**Figure 3c**), the perceptions are positive. This can be seen from the stakeholder perceptions, which tend to cluster in Quadrant I, meaning that the perceptions are relatively positive. Nevertheless, the results of the F-test showed that there were significant differences in perceptions in all of the tested aspects.

Figure 3c1 indicates that the perceptions of biophysical and economic aspects can be assigned based on the following contrasting opinion groups: (1) Perhutani; (2) the local communities (LVC and SVC); (3) the local governments (GRG and BRG) and NGOs; and (4) BBKSDA. Meanwhile, in relation to biophysical and socio-cultural aspects, the opinion groups formed are as follows: (1) Perhutani, (2) the local communities, (3) the local governments and BBKSDA (4) NGOs. This condition is a sign that there are different perceptions and interests regarding BBKSDA management activities. This condition is also proven by the F-test results which indicated significant differences in perceptions in all aspects: biophysical aspects [$F_{count}(4.21)>F_{table}(2.14)$], economic aspects [$F_{count}(9.81)>F_{table}(2.14)$] and socio-cultural aspects [$F_{count}(3.16)>F_{table}(2.14)$].

It is more than likely that rather negative assessment of Perhutani's Nature Park management is a result of psychological effects caused by changes in the Nature Park's management rights. Before 2010, Perhutani administered the Nature Park, thus Perhutani may have strong internal motives to perceive their own management as better than that of BBKSDA (after 2010). The activities perceived negatively by Perhutani include the protection of essential ecosystems, reforestation, and utilization of non-wood forest products, on-going ecotourism business, and involvement of the local communities in the forest management activities.

According to Gorner et al. (2012: 1355-1356), a conservation area or protected forest cannot productively coexist with people who are hostile to conservation management. In contrast, it can achieve significant social and economic objectives when placed in a proper context. For example, the involvement of local people in the management of the Sumava National Park in the Chez Republic over a ten period yielded positive changes in the local people's perceptions. The national park management was not only successful and effective in improving the social climate of the local people, but it was also able to help the local people gain benefits from ecotourism.

It is worth noting that Sukakarya Village Community also has rather negative assessment (dissatisfaction) over the development and preservation of local wisdoms as well as the preservation of places used for religious and spiritual rituals. The managing authorities should pay proper attention with regard to this situation. According to Rutte (2011: 2388)

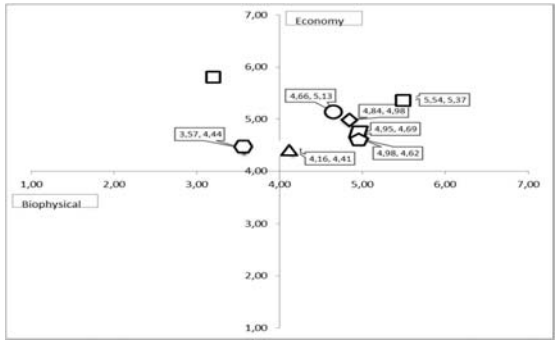
locations, which, in the long term, will serve as sites for religious rituals, should be integrated into conservation strategies. She explained that sacred sites play an important role in biodiversity conservation because such sites are often situated in the areas that are rich in biodiversity. Furthermore, sacred sites are important because they have low rate of human disturbance, high percentage of vegetation cover, and higher biodiversity compared to the surrounding area. With regard to social aspect, local people have protected sacred sites for a long time, developed effective and equitable rules, and shown adaptive capacity to changes. Rutt's concept can potentially be applied to the KKFA, especially to areas of *Puncak Lancang* area, *Kahuripan* area, and *Bukit Kukus* area. Unfortunately, the managing authorities pay little attention to these areas.

It is also interesting to note that BBKSDA, which is in fact the administrating unit of the natural conservation and Nature Park, evaluated the preservation of rare plant species and reforestation outside the area as unsatisfactory. On the one hand, this may have to do with lack of funds allocated by the government to the two activities, but on the other hand, this may be an indication of "project-minded" amongst bureaucrats in BBKSDA. These assumptions become inevitable as BBKSDA also perceived ecotourism business in the natural conservation negatively. However, BBKSDA should have realized that it is theoretically impossible to run nature-based tourism business in the natural conservation area. Based on Act of the Republic of Indonesia No. 5 of 1990, article 17 paragraph 1, recreational activities are not permitted within areas designated as natural conservation; where are only activities for research and development, science, education, and other activities supporting enhanced breeding are permitted.

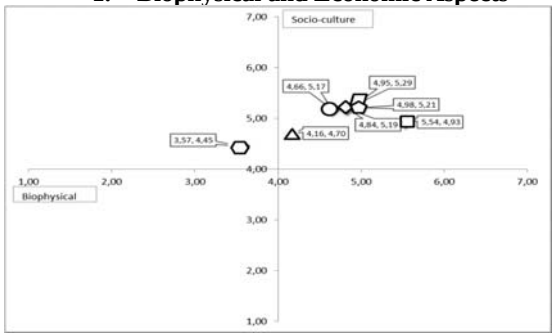
c. Stakeholder Perceptions of the Ongoing Forest Utilization Activities

The ongoing forest utilization programs in KKFA include: (1) ecotourism business, i.e. *Kawah Kamojang* Nature Park and Situ Cibereum, located within the protected forest around Sukakarya Village; and (2) geothermal business within KKFA. Based on the findings, as presented in Figure 4, it is also known that there are diverse perceptions among the stakeholders on these ongoing programs.

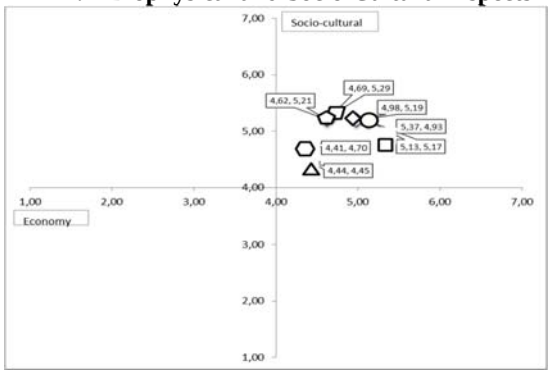
a. Protected Forest



1. Biophysical and Economic Aspects

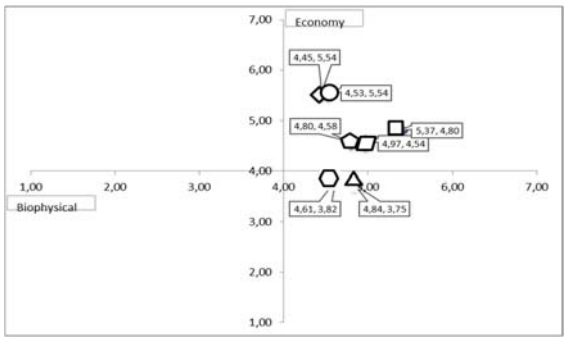


2. Biophysical and Socio-Cultural Aspects

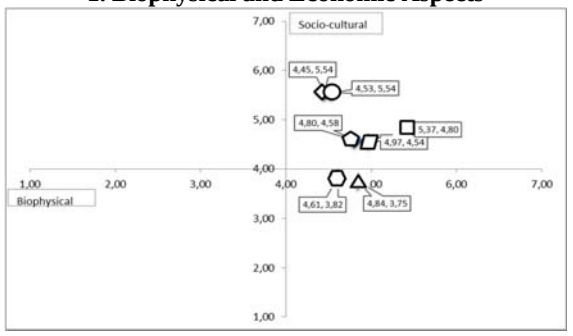


3. Economic and Socio-Cultural Aspects

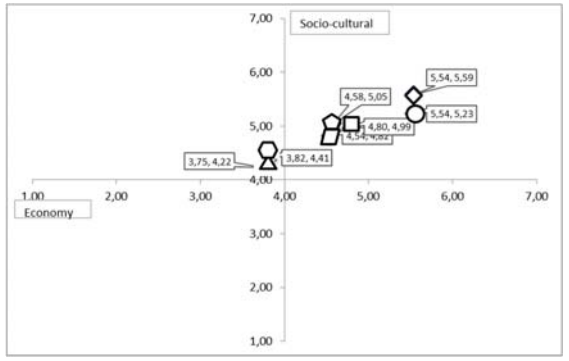
b. Natural Conservation



1. Biophysical and Economic Aspects

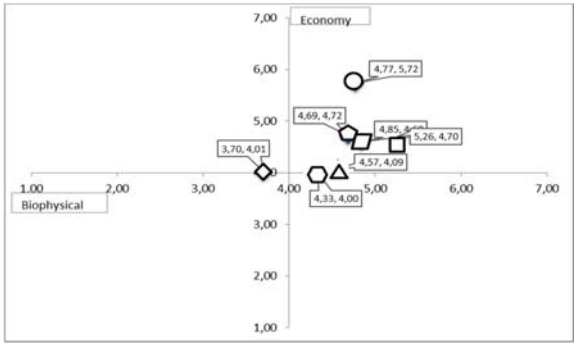


2. Biophysical and Socio-Cultural Aspects

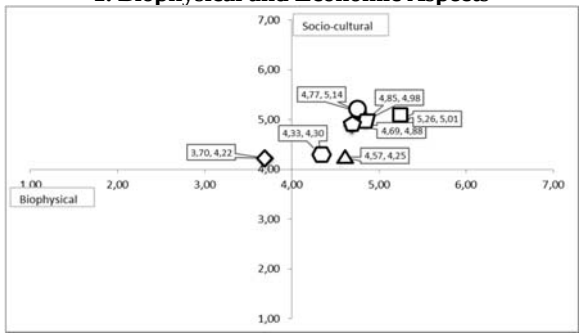


4. Economic and Socio-Cultural Aspects

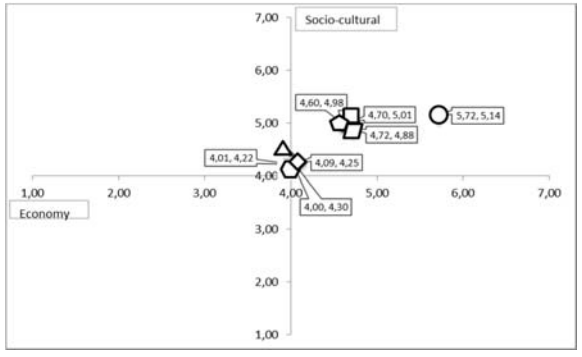
c. Nature Park



1. Biophysical and Economic Aspects



2. Biophysical and Socio-Cultural Aspects



5. Economic and Socio-Cultural Aspects

Description of Symbols: : Laksana Village Com; : Garut Government; : Sukakarya Village Com; : BBKSDA West Java; : Bandung Government; : Perhutani; : NGOs

Fig 3. Polarization of Stakeholder Perceptions of *Kawah Kamojang* Forest Management Activities

Polarized Perceptions of Ecotourism Activities within *Kawah Kamojang* Nature Park. The findings indicate that there are negative perceptions on *Kawah Kamojang* Nature Park's ecotourism management (Figure 4a). This is evident from a concentration of the stakeholders' perceptions in Quadrant II, meaning that the perceptions are relatively rather negative.

Stakeholder perceptions of the biophysical aspects of the ecotourism management **(**Figure 4a1) form three opinion groups: (1) the communities; (2) NGOs; and (3) BBKSDA, Perhutani and local governments (GRG and BRG). This is proven by the results of the F-test which indicated significant differences in the stakeholder perceptions, which formed positive-negative polarization on the biophysical aspects: Positive perceptions [$F_{count}(13.33) > F_{table}(2.14)$]; Negative Perceptions [$F_{count}(90.70) > F_{table}(2.14)$].

The stakeholder perceptions of the said aspect tend to be concentrated in Quadrant I (positive), except for the village communities (LVC and SVC), which are concentrated in Quadrant II (rather negative). Diverse perceptions between the local communities and other parties can serve as an important indicator for the managing authorities, considering the fact that the local people are the ones who know more about the ecological dynamics and economic and social impacts of the changes in the forest area. The communities (LVC and SVC) find that the increased ecotourism activities in the Nature Park have brought about habitat fragmentation on the population of wild animals, the loss of biodiversity, increased amount of degraded land, and landscape damage. Empirically, the fact that they seldom encounter rare species, such as *macan kumbang* (*Panthera pardus*) or Surili-monkey (*Presbytis comata*) in the Nature Park, compared to when there were fewer visitors, influences the communities' perceptions.

The stakeholder perceptions of the economic aspects of *Kawah Kamojang* Nature Park ecotourism (Figure 4a2) form four opinion groups: (1) SCV; (2) LVC, GRG, and BRG; (3) BBKSDA and Perhutani; and (4) NGOs. This is proven by the results of the F-test which indicated significant differences in perceptions, which also form positive-negative polarization, among the stakeholders with respect to economic aspects; in which the positive perceptions [$F_{count}(6.55) > F_{table}(2.14)$], and the negative perceptions [$F_{count}(5.92) > F_{table}(2.14)$].

The village communities and local governments' perceptions of economic aspects tend to cluster in Quadrant II, meaning that there are negative perceptions and dissatisfaction with the distribution of economic benefits. It appears that this condition is caused by the fact that the local government (GRG and BRG) cannot derive the benefits from the Nature Park and that the park cannot accommodate all the needs of the local people (SVC and LVC). This is because the Nature Park management is still controlled by BBKSDA. Moreover, BBKSDA management does not allow other parties to participate and derive benefits.

When it comes to socio-cultural aspects (Figure 4a3), the stakeholder perceptions cluster into four opinion groups: (1) Perhutani; (2) NGOs; (3) BRG, GRG, and BBKSDA; (4) LVC and SVC. This finding is supported by the F-test results which showed significant differences in the perceptions: Positive perceptions [$F_{count}(6.78) > F_{table}(2.14)$]; negative perception [$F_{count}(2.49) > F_{table}(2.14)$].

The stakeholder perceptions of socio-cultural aspects of the ecotourism activities are rather negative. Local governments (SVC and LVC) argued that the management has been monopolized by BBKSDA and that it gives small opportunity for the residents to participate. BBKSDA controls the distribution of business rights among people, concerning the administration and management of the Nature Park. The unequal distribution of rights among the local people has resulted in social envy.

Polarized perceptions of ecotourism activities within Situ (Lake) Cibeureum. The findings show rather negative perceptions of the ecotourism management within Situ Cibeureum (Figure 4b). This is proven by the stakeholder perceptions that are concentrated in Quadrant II; meaning that the perceptions are relatively rather negative.

In terms of biophysical aspects, the stakeholder perceptions (Figure 4b1) tend to spread over the quadrants. SVC and BRG fall within Quadrant IV (rather negative), whereas LVC, GRG, NGOs, BBKSDA and Perhutani tend to fall within the boundary between Quadrant I and II (positive perception, but with low value).

The F-test on positive perceptions indicated a significant difference in the positive perceptions of the stakeholders [$F_{count}(25.33) > F_{table}(2.14)$]. On the contrary, the F-test on negative perceptions about Situ Cibeureum management showed that there was no significant difference in the stakeholders' negative perceptions in terms of biophysical aspects [$F_{count}(1.88) < F_{table}(2.14)$]. The negative perceptions on Situ Cibereum management probably have to do with the environmental issues, i.e. increase in degraded land and worries about possible soil erosion and landslides in this landslide-prone are. The field observations indicate that the landslide-prone condition in the area may be triggered by the absence of spatial layout plan regulation and the existence of massive coffee and vegetable farms to the extent that reforestation cannot offset.

The stakeholders' perceptions on economic aspects of Situ Cibeureum ecotourism (Figure 3b2) form three opinion groups: (1) the village communities in Quadrant III (which indicates negative perception); (2) Garut Regional Government in Quadrant IV (rather negative perception); and (3) BRG, NGOs, BBKSDA and Perhutani in Quadrant II (rather negative perception). This is proven by the following F-test results: Positive perception [$F_{count}(29.09) > F_{table}(2.14)$], meaning that there was a significant difference in the stakeholders' positive perceptions of economic aspects of Situ Cibereum ecotourism; Negative perception [$F_{count}(3.01) > F_{table}(2.14)$], meaning that there was a significant difference in the stakeholders' negative perceptions of the same aspect.

It is assumed that the reason for the stakeholders' negative evaluation is that the local people do not perceive the benefits from Situ Cibereum ecotourism to their economic improvements or to the regional income of Garut and Bandung Regencies. The village governments (of Sukakarya and Laksana Village Administratives) recalled that the poor ecotourism management of Situ Cibeureum has reduced employment opportunities for the local people and hindered the growth of other business sectors.

The stakeholders' perceptions of the socio-cultural aspects of Situ Cibeureum ecotourism (Figure 4b3) form three opinion groups: (1) village administrative governments; (2) NGOs; and (3) GRG, BRG, BBKSDA and Perhutani. This finding is supported by the results of the F-test which indicated significant differences in perceptions among the stakeholders, which form positive-negative polarization: Positive perception [$F_{count}(7.84) > F_{table}(2.14)$]; Negative perception [$F_{count}(5.82) > F_{table}(2.14)$]. Winarno et al. (2015: 278) stated that the polarized perceptions could hamper the development

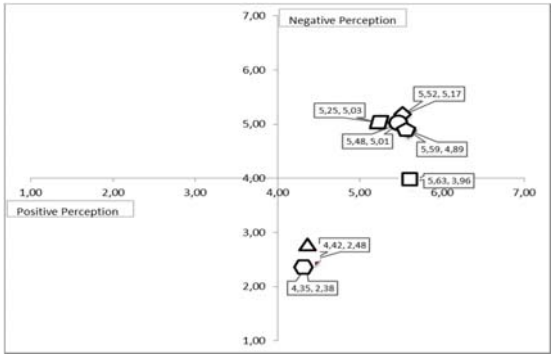
of ecotourism; thus, in order to solve the problem, there should be alignment in perceptions among the ecotourism stakeholders.

The perceptions held by village communities and NGOs on the socio-cultural aspects of Situ Cibeureum tend to be rather negative (concentrated in Quadrant II). These negative perceptions may result from inharmonious relationships between the managing authorities, Sukakarya Village government, and other parties. It has been agreed that Perhutani and Sukakarya community village will collaborate in managing Situ Cibeureum ecotourism, but in practice, only certain groups of people control the management. The existence of horizontal conflicts in the ecotourism area results in poor management and negative internal and external social interaction.

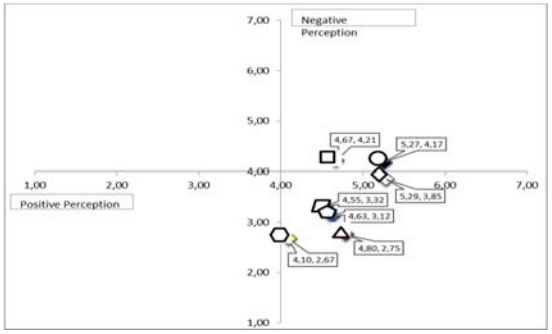
The ecotourism development plans, which are viewed as having negative impacts on socio-cultural aspects, can be an important indication of the need for overall and serious improvements in the KKFA management. In the context of positive socio-cultural impacts of ecotourism on society, Perdue et al. (1990) emphasized that almost all studies have reported that there is a positive correlation between economic benefits and attitudes towards ecotourism development. Stronza (2007: 210) also stated that ecotourism is not a mere economic tool of conservation, but also the purveyor of values and new social interaction. In line with this, Gursoy & Rutherford (2004) stated that besides serving as a tool to deal with economic problems, such as unemployment perceived by local communities, ecotourism provides socio-cultural benefits.

Polarized Perceptions of Geothermal Business: The findings show the perceptions of the geothermal business within KKFA (Figure 4c) are negative. This is evident from a concentration of stakeholder perceptions in Quadrant II, which means that the perceptions are rather negative.

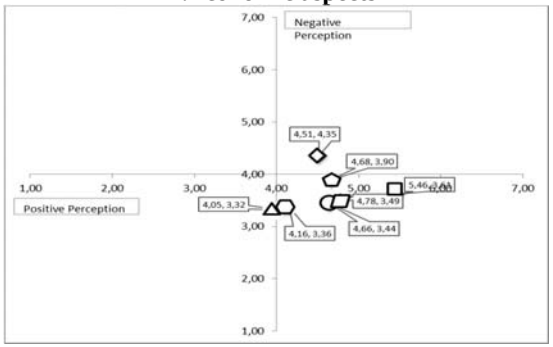
a. *Kawah Kamojang* Nature Park



1.Biophysical aspects

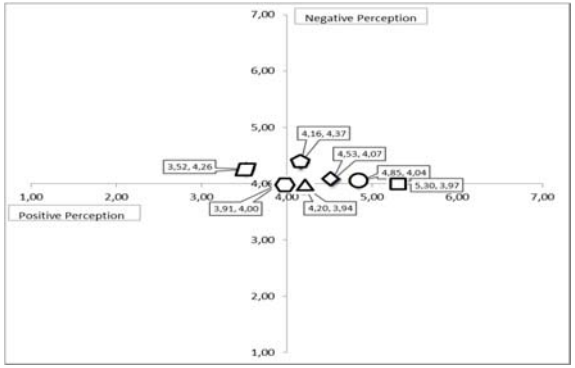


2.Economic aspects

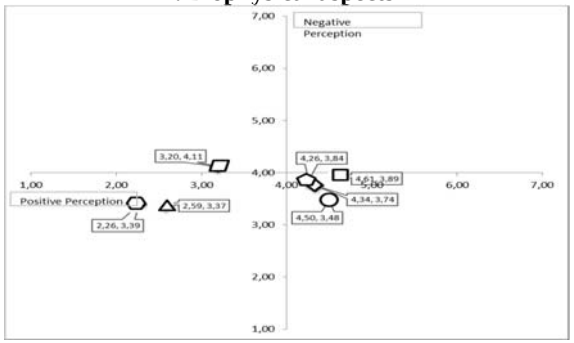


3.Socio-cultural aspects

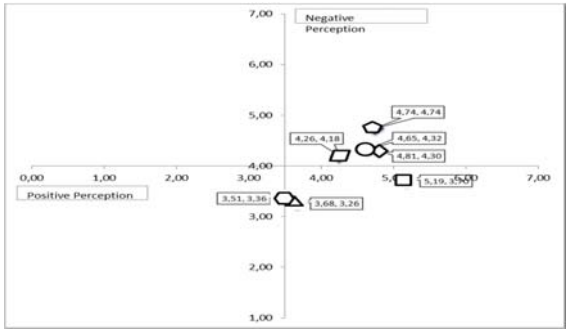
b. Situ Cibeureum Ecotourism



1. Biophysical aspects

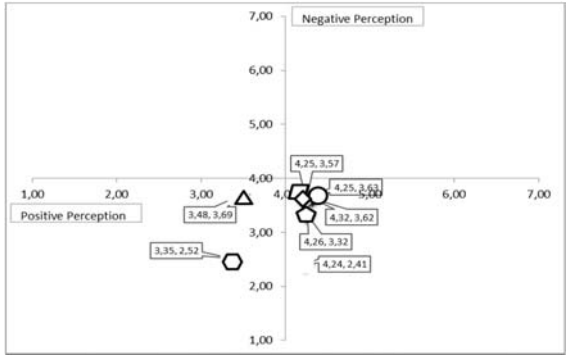


2. Economic aspects

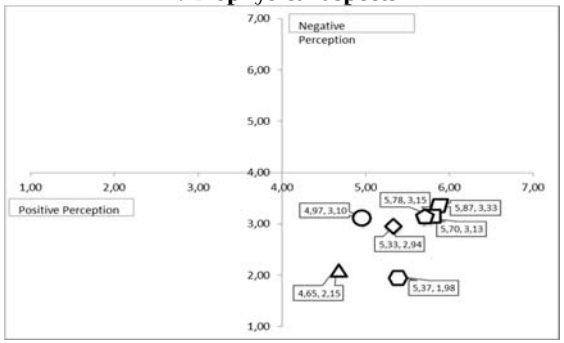


3. Socio-cultural aspects

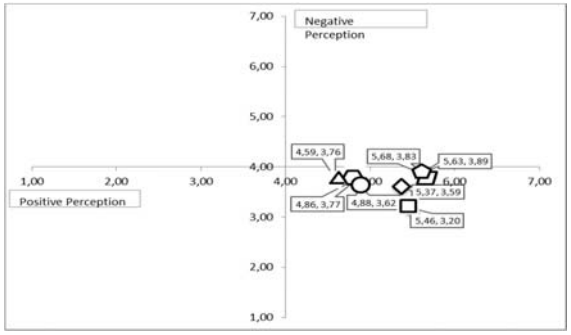
c. Geothermal Business



1. Biophysical aspects



2. Economic aspects



3. Socio-cultural aspects

Description of Symbols: : Laksana Vil. Com. : Garut Government : Sukakarya Vil. Com. : BBKSDA West Java : Bandung Government : Perhutani : NGO

Fig 4. Stakeholder Polarized Perceptions of the Ongoing *Kawah Kamojang* Forest Utilization Activities

Stakeholder perceptions of the biophysical aspects of the geothermal business (Figure 4c1) form three opinion groups: (1) LVC (Quadrant III/negative perception); (2) SVC (Quadrant III/negative perceptions); and (3) BRG, GRG, NGOs, BBKSDA and Perhutani, which fall in Quadrant II (rather negative perception). The F-test also showed significant differences in perceptions among the stakeholders, with respect to the biophysical aspects of KKFA geothermal business: Positive perception [$F_{count}(5.82)>F_{table}(2.14)$]; negative perception [$F_{count}(11.85)>F_{table}(2.14)$].

Stakeholder perceptions of the biophysical aspects of the geothermal business are negative, which indicate concern among the stakeholders with the possible negative impacts of the existence of the geothermal business. The stakeholders and the local communities are concerned with increased pollution, water quality and quantity deterioration, loss of biodiversity and landscape damage. Despite the potential risks, there is relatively no opposition. However, this is not the case in a study conducted by Cornish and Romanach (2014:1562), which found that Australians have intense concern about the potential risks of geothermal projects located near their communities, thus the majority of Australians prefer that geothermal projects be located at least 100 km away from their residences. In order to anticipate opposition from the local people to geothermal business within KKFA, there is a need for dissemination of information to the local people that geothermal technology is safe.

Stakeholder perceptions of the economic aspects of geothermal business (Figure 4c2) tend to cluster in BRG, GRG and NGOs; meanwhile, with regard to LVC, SVC, BBKSDA, and Perhutani, the perceptions tend to spread. The results of the F-test showed that there were significant differences, as proven by the scores: positive perceptions [$F_{count}(3.01)>F_{table}(2.14)$]; negative perceptions [$F_{count}(25.42)>F_{table}(2.14)$]. Polarization formed in Quadrant II suggests that the perceptions are rather negative, which is an indication that the stakeholders are dissatisfied with the geothermal business run within KKFA.

Overall, the stakeholders' perceptions on the economic aspects of geothermal business within KKFA are rather negative. Negative perceptions formed in SVC and LVC are closely related to the fact that there are few local employees compared to the dominating 'non-local' employees. There is economic discrepancy between the local communities and 'newcomers', which can cause social envy. In addition to that, there is similar concern among the stakeholders over increased asset sales by the local people to newcomers.

With regard to socio-cultural aspects (Figure 4c3), stakeholder perceptions tend to be concentrated in Quadrant II, meaning that the perceptions are rather negative. The critical value that was greater than the F value (the calculated value) [$F_{count}(0.10)< F_{table}(2.14)$] indicated that there was no significant difference, meaning that there are similar negative perceptions among all parties on the socio-cultural aspects of the geothermal business. This negative perception may be caused by the growing concern among the stakeholders that increased consumerism among the local people can trigger crime in KKFA. Meanwhile, the F-test on positive perception indicated significant differences in the positive perceptions [$F_{count}(17.07.78)>F_{table}(2.14)$].

3.3. Stakeholder Motivations

The findings show that stakeholder motivations in the utilization of the natural resources within KKFA tend to vary considerably; thus, it is not surprising that there are differences in dealing with the management of KKFA. Peterson and Diss Torrance (2014: 204) stated that understanding motivations for environmental actions is crucial for understanding social dynamics and planning rules in the area.

Polarized Motivations for the Utilization of Natural Resources in Protected Forest. From **Figure 5c,** it can be seen that there are negative polarized motivations for the utilization of natural resources from KKFA. This is evident from stakeholder motivations that tend to cluster in Quadrants II and IV, which means that the motivations are relatively rather negative.

Figure 5a1 shows that the motivations for the utilization of the protected forest with regard to biophysical and economic aspects form four motivation groups: a) LVC and SVC in Quadrant I; b) NGOs in Quadrant II; c) Perhutani in Quadrant I; and d) BRG and GRG in Quadrant II. When it comes to biophysical and socio-cultural aspects (Figure 5a2**)** form two polarized motivation groups: a) the village communities (between Quadrants I and II); and b) Perhutani, NGOs, and local governments (Quadrant I). As regards economic and socio-cultural aspects (Figure 5a3), the motivations form four different groups: a) the local communities (between Quadrants I and II); b) local governments (Quadrant IV); c) NGOs (Quadrant I); and d). Perhutani (Quadrant I). The results of the F-test on motivations, viewed from all aspects, are as follows: biophysical aspects [$F_{count}(6.98)>F_{table}(2.14)$], economic aspects [$F_{count}(10.36)>F_{table}(2.14)$], and socio-cultural aspects [$F_{count}(67.15)>F_{table}(2.14)$]. The results prove that there were significant differences in stakeholder motivations for the utilization of the protected forest area.

Polarized Motivations for the Utilization of Natural Resources in Natural Conservation. From **Figure 5b**, it can be seen that there are negative motivations for the utilization of natural resources in the Natural Conservation. This is evident from stakeholder motivations which are clustered in Quadrants II and IV, which means that the motivations are relatively rather negative.

The motivations with regard to biophysical and economic aspects (Figure 5b1) form there groups, namely: a) the local/village communities (in Quadrant II), b) NGOs (in Quadrant I), and c) local governments and BBKSDA (in Quadrant II). When it comes to biophysical and socio-cultural aspects (Figure 5b2), it can be seen that the motivations form two groups: a) the village communities (in Quadrants II); and b) local governments, NGOs and BBKSDA in Quadrant I. With respect to economic and socio-cultural aspects (Figure 5b3), the motivations form three groups: a) the village communities in Quadrant III; b) NGOs in Quadrant I; and c) the local governments and BBKSDA in Quadrant IV. The F-test on the motivations as regards all aspects showed the following results: Biophysical aspects [$F_{count}(27.38)>F_{table}(2.14)$], economic aspects [$F_{count}(13.04)>F_{table}(2.14)$], and socio-cultural aspects [$F_{count}(111.33)>F_{table}(2.14)$]. The results also indicated that there were significant differences in stakeholder motivations for the utilization of the natural conservation.

Polarized Motivations for the Utilization of Natural Resources in Nature Park. The findings in **Figure 5c** show that the motivations for the utilization of natural resources in the Nature Park are negative. This is evident from stakeholder motivations that tend to be concentrated in Quadrants II and

IV, which means the resulting motivations are relatively negative.

Stakeholder motivations for the utilization of natural resources in the Nature Park, with respect to biophysical and economic aspects (Figure 5c1), tend to cluster in Quadrant II, except for those of NGOs which are concentrated in Quadrant I. When it comes to biophysical and socio-cultural aspects (Figure 5c2), the motivations form three motivation groups, namely: a) the local communities in Quadrant II; b) NGOs in Quadrant I; and c) local governments and BBKSDA in Quadrant I. With respect to economic and socio-cultural aspects (**Figure 5c3)**, the motivations form four groups, namely: a) the local communities in Quadrant III; b). local governments in Quadrant IV, c). NGOs in Quadrant I, and d) BBKSDA in Quadrant II. The F-test on all aspects resulted in the following: biophysical aspects [$F_{count}(21.20)>F_{table}(2.14)$], economic aspects [$F_{count}(16.58)>F_{table}(2.14)$], and socio-cultural aspects [$F_{count}(58.20)>F_{table}(2.14)$]. The results proved that there were significant differences in stakeholder motivations for the utilization of natural resources in the Nature Park.

Stakeholders' Diverse Motivations for the Utilization of KKFA. Considering the above findings, it can be inferred that there are diverse motivations among the stakeholders for the utilization of every forest function in KHKK. The diverse motivations are influenced by differences in interests of each party as regards the existence of KHKK.

The local communities have diverse motivations for the utilization of forest functions in KKFA, which tend to be more oriented at biophysical and economic aspects than compared socio-cultural aspects. The local people's motivations for the utilization of biophysical functions of the protected forest include fresh air, temperature comfort, and air humidity; as far as economic aspects are concerned, the motivations include free fertile land, water resources, and non-wood forest products. Meanwhile, the local people's economic motivations for the utilization of natural conservation tend to be oriented to water resources. When it comes to Nature Park, the local people's economic motivations include water resources, job opportunities, and economic benefits (from the ongoing ecotourism business).

With regard to KKFA, the local people's actions tend to be biophysically and economically motivated. This is in line with the study conducted by Dolisca et al., (2007: 704) in Haiti, which found that local people's involvement in forest utilization tend to be motivated by economic and environmental objectives, such as tourism and tree planting activities. Furthermore, it is explained that management activities, which can produce economic benefits, such as road maintenance inside the forest, increased income from cleaning operation, and tourism activities, are perceived as the most important benefits of a forestry conservation program. Local people believe that biophysical benefits, such as improved air quality and habitat for plants and animals, are not the main objectives of forestry programs. Nevertheless, local people believe that biophysical activities, such as soil protection will give positive impact on their farming activities.

The local governments (both BRG and GRG) tend to value biophysical and socio-cultural aspects of the utilization of protected forest more than economic aspects. The government's motivations include maintaining the forest area so that their people can enjoy fresh air and cool temperature, preserving water resources, and protecting their people form landslides, as well as maintaining landscape aesthetics. Local government maintains the same motivations for the utilization of natural resources in the nature reserve and Nature Park. The main objective of the government is to increase regional real income (PAD) from geothermal business through profit sharing.

With respect to the utilization of the protected forest, Perhutani tends to have biophysical and socio-cultural motivations rather than economic ones. Perhutani's biophysical motivations include conserving forest area in order to preserve biophysical factors, such as flora and fauna. Meanwhile, in terms of socio-cultural aspects, their motivations for their actions include delegating routine tasks, educating the local community, building relationships with other parties and enhancing job experience. With regard to economic aspects, their motivations include getting added incentive if they can achieve certain targets, getting incentive from the beneficiaries. The motivations of BBKSDA for the utilization of the natural conservation and Nature Park are more or less similar to those of Perhutani.

The motivations of Perhutani and BBKSDA's employees outlined above are in line with the study of a timber company in Argentina conducted by Faggia et al. (2014: 542). The study found that the motivations of the employees for involvement in the collaborative forest management include developing relationships and improving the work experience. The underlying reasons include gaining recognition from the surroundings and getting certification. This finding indicates that most of the motivations result from daily obligations and are not based on self-awareness. Riley (2005:6) stated that based on Herzberg's theory, such motivations are weak because they are influenced by extrinsic factors. According to Herzberg's theory, there are two factors that encourage work motivations of the employees; namely: (1) intrinsic factors, i.e. motivations that come from within the individual, and (2) extrinsic factors, i.e. motivations that come from outside the individual, particularly from the organization in which the individual works. Intrinsically motivated employees will love their job; thus, they are more creative and innovative, able to work with high level of autonomy and do not require strict supervision. In this case, work satisfaction is not related to materialism. On the contrary, the employees who externally motivated tend to focus on the reward given by the organization; hence, they work in order to attain outcomes that are desired by the organization.

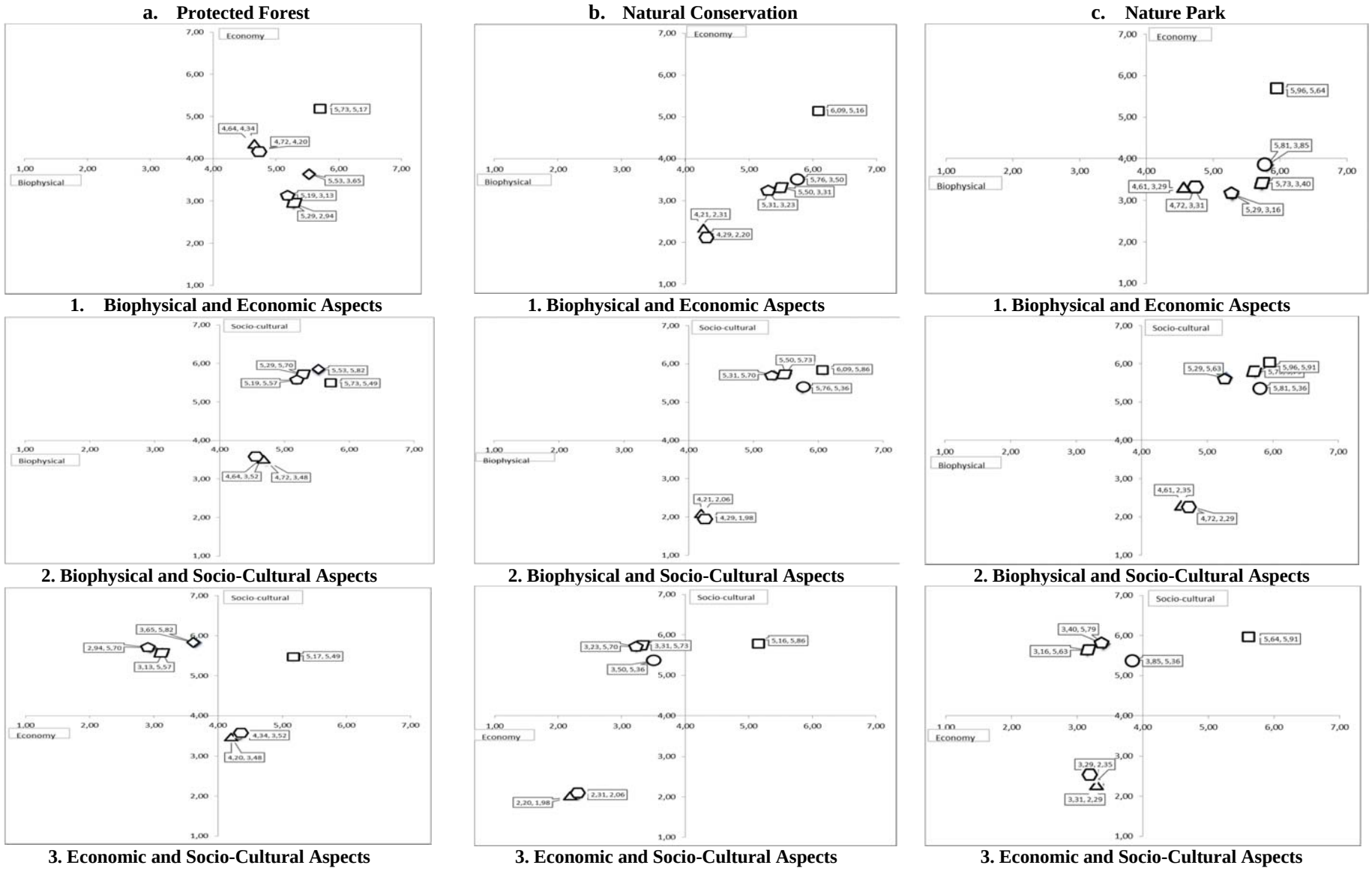


Fig 5: Stakeholder Polarized Motivations for the Utilization of Natural Resources from *Kawah Kamojang* Forest Area

Differences in stakeholder motivations cannot be separated from their diverse interests. The local communities tend to focus on livelihood enhancement, which leads to per capita income. Local government, meanwhile, tends to focus on regional real income (PAD), which is by managing resources provided by the forest, such as ecotourism management and water resources utilization. As to NGOs, they tend to be consistent and have positive motivations, whether in terms of biophysical, economic, and socio-cultural aspects, in preserving the resources in KKFA.

Although there are differences in motivations and interests among the stakeholders as regards the existence of KKFA, the findings show that biophysical motivation still becomes the stakeholders' biggest motivation for the utilization of KKFA resources. The stakeholders around KKFA attempts to follow the procedures and comply with the rules, but still they expect KKFA management can be optimized so that it can give more opportunity for participation in managing and utilizing KKFA resources.

4. Conclusion And Suggestions

Stakeholder perceptions of the benefits and services of KKFA tend to be positive. This finding is supported by the results of the test on 63 perception sets, which indicate that the stakeholders have relatively positive perceptions, while rather negative perceptions (6.3 %) only come from 4 perception sets from SVC and LVC, particularly with respect to the Nature Park's economic benefits. Meanwhile, the test on 63 perception sets about stakeholder perceptions of KKFA management reveals 11 rather negative perception sets (15.87%), obtained from 3 LVC perception sets on protected forest management, 6 SVC perception sets on the nature reserve management, and 3 Perhutani perception sets on Nature Park management. Stakeholder perceptions of the ongoing forest utilization programs (ecotourism activities in the Nature Park, Situ Cibeureum and geothermal business) tend to be negative, as obtained from 43 sets (68.25%), which are dominated by rather negative perceptions from LVC and SVC. Meanwhile, 6 perception sets are negative (9.52%) and the other 14 sets are positive (22.22%).

Overall, the results suggest that the stakeholders respond negatively to all three ongoing KKFA utilization programs/ activities. In the context of stakeholder motivations, there are three different motivation/orientation groups: (1) KKFA's managing authorities and NGOs that tend to value sustainable forest management; (2) the local communities that are inclined value livelihood enhancement the most; and (3) the government which tends to focus on regional real income (PAD).

The findings indicate that the interested parties have different perceptions and motivations with respect to KKFA management, which result in polarized orientation. These differences in turn make it difficult for the management to produce optimum benefits. The stakeholders' polarized perceptions and motivations also suggest conflict of interest among the stakeholders that hinders optimum sustainable forest utilization. Thus, alignment of perceptions and motivations among the stakeholders is crucial for optimum management of KKFA.

Considering the fact that the protected forests and conservation areas in KKFA have many similarities, they should be managed optimally by taking into account biophysical, economic, and ecological aspects. Moreover, there is a need for continuous collaborative management that gives more opportunities for forest sustainability, economic benefits and harmonious socio-cultural interaction. Hence, continuous spatial forest planning and sustainable management of KKFA, which emphasizes collaboration among stakeholders, becomes very crucial. In line with this, Arnold et al. (2012: 1) stated that collaboration can boost learning, build social legitimacy for decision making, and establish relationships that support learning and adaptation in the long term.

The managing authorities (BBKSDA and Perhutani), should work in coordination with local governments and share roles. For instance, while BBKSDA and Perhutani focus on the management of the forest area, the local government can run supporting programs outside forest area, such as making effort in enhancing its people's livelihood and making policies that can support the management of the protected forest and conservation area. In return, local government should be given more opportunity to increase its regional real income through ecotourism management or water resources utilization. As to NGOs, they should be a conservation partner, particularly in the empowerment of local people and preservation of ecosystems, especially the conservation of flora and fauna.

Finally, it should be stressed that the utilization of KKFA should be done to such an extent that does not exceed environmental carrying capacity in accordance with the principles of sustainable development, which stress the preservation of biodiversity required to meet the needs of future generations (WCED 1987: 41-42). Basuni (2012: 479) who argued that environmentally sound and sustainable natural resources management is an attempt to preserve the benefits in such a way that it does not damage the environment and become a burden to the people in the future expresses the same opinion. Therefore, through sustainable natural resources management, it is expected that KKFA can bring optimum benefits and services, that is, enhances the livelihood of the local people (economic aspect); the available resources are well protected and preserved (ecological aspect); and harmonious and equitable distribution of the benefits among the stakeholders can be maintained (socio-cultural aspect).

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