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Biodiversity conservation at Betung Kerihun National Park: the positive role of customary law in mitigating a local community trust deficit

A Sunkar¹ and Y Santosa¹

¹Bogor Agricultural University, Faculty of Forestry, Department of Forest Resources Conservation & Ecotourism, P.O Box 162, Kampus IPB Darmaga, Indonesia

Email: arzyanas@gmail.com

Abstract. Areas rich in bio-cultural diversity, such as national parks, are in growing demand as nature-based tourism destinations, and have the potential to maximize the benefits of nature-based tourism for conservation. Various studies have demonstrated the essential role of social capital in the successful management of such parks. This paper similarly identified this key variable in efforts to enhance Betung Kerihun National Park as a protected area; however, an additional dynamic was found here to be crucially important. Trust is usually cited as the main component of social capital in effective sustainable area management. Data were collected through interviews, field observation and literature study. Interviews were conducted using convenience sampling technique. The research found that the level of trust evinced by the local community towards the national park authority was influenced by the access granted the former to the park’s natural resources. Limitations on access, especially to resources important to local culture, (often governed by customary law), had significantly reduced that level of trust. However, the research also found that customary laws, as embodied in social norms, could have a positive impact on community participation in conservation activities, despite the reduced level of trust. The major conclusion of this research was that customary law, as a constituent of social norms, was a more important determining factor than trust, in the success of biodiversity conservation at Betung Kerihun National Park. The indigenous people perceived the national park as an entity deserving of care and respect, rather than just a resource; giving them a sense of place attachment towards the park and its resources. These results suggest that understanding complex social dynamics of a given situation and respect for customary law are effective ways to boost community empowerment as part of biodiversity conservation and the destination governance of Betung Kerihun National Park.

1. Introduction

For decades, top-down conservation is in fact, perceived to have reduced access to resources and welfare, thus causing national parks to be often deemed incapable of improving the welfare of society. Their establishment has sometimes involved the displacement of, and loss of assets by the local people [2, 3]. A study by Muhumuza and Balkwill found about 39% of all biodiversity conservation failures in national parks in Africa, were due to restrictions on access to natural resources within the park [1]. This has led to a negative outlook among the communities towards the national parks and their managers, which will eventually affect the achievement of an effective management of the protected area.
Based on their findings, [1] conclude that biodiversity conservation in national parks is strongly influenced by various social, economic and cultural factors, emphasizing the importance of community management in the buffer zone of national parks. Subsequently, the mission of protected area has expanded from biodiversity conservation to improving human welfare [4]. Therefore the success of conservation is often foreseen on the strength of local supports for conservation, which is strongly influenced by the perception of the impacts that are experienced by the local communities and their opinions of the area management and governance [5]. Local people's perception on the protected areas will determine their attitudes towards the protected areas [6, 7]. Therefore, an understanding of community perceptions, especially in buffer zones, is essential to improve the relationship between the NP and communities [8], which can increase their participation in biodiversity conservation efforts. The views of various conservationists in the world [9-11] also conclude that biodiversity conservation of an area and its ecosystem will be successful if local people are actively involved in conservation efforts.

Research by [12] state that many studies show increased activities in respect of natural resources conservation by the local communities in and around protected areas, where such communities have established good relationship between one individual to another, within a group or network, as well as when their knowledge were applied in the planning and implementation of conservation and development activities. This suggests that the element of trust within the community is very important and plays a crucial role in managing urgent and complex environmental challenges [13]. Reference [14] states that the common thread among the various types of participatory conservation and development strategies are the beliefs, social norms and social networks, all of which are elements of social capital. Thakadu [15] and Baksh et al [16] emphasize the importance of identifying social capital to gain effective participation, in addition to forming positive attitudes and behaviours [17]. High social capital becomes the determinant variable for effective area conservation [18].

Managing human impacts on national parks, has proved to be a formidable challenge for the government and other natural resource managers, because in general, the people who live around the national parks, rely heavily on the region. Yet, as mandated in the Indonesian Act No. 5 of 1990 on the Conservation of Natural Resources and Their Ecosystems, the existence of NP should be able to provide the greatest benefits to the community. This problem becomes increasingly complex, if the national park area was formed on the area that has been the source of community livelihood. Very often, reduced access or limited access to natural resources within the park have accelerated social conflicts between the local people and the area manager, which tend to lower their trusts on the national park’s authority. This formed a question at which level is trust sufficient, between the local communities and the national park manager, to maintain biodiversity conservation within the national park. Yet, trust is very often found as the determinant element of social capital for a successful area management.

On the other hand, previous studies have noted that special interests within a site [19, 20] will enhance the sense of place attachment [21 and 22], which in turn will exhibit higher environmentally responsible behaviour [23, 24]. This is supported by Clayton and Opotow [25] theory that pro-environmental action is facilitated when individuals perceive nature as a moral entity rather than just a resource and when social environments are designed to nurture a feeling of connectedness with nature and when social contexts support pro-environmental identities. Such local norms are often found among indigenous people who are very dependent on their environment. Using social capital as an exogenous variable, this research had the objective to study the influence of social capital of the indigenous Dayak people of Betung Kerihun NP on their attitudes toward the conservation of biodiversity within the national park.

2. Methodology
The study was carried out in September 2015 and was conducted in 9 villages/hamlets representing the various existed Dayak tribes among the four sub-districts comprising the Betung Kerihun National Park of West Kalimantan Indonesia: (1) Sub-district of Batang Lupar - Labian Iraang Village
(Embalo and Iban Dayak tribes) and Mensiau Village (Iban Dayak tribe); (2) Sub-district of Embaloh Hulu - Sadap Hamlet (Iban Dayak tribe); (3) Sub-district of North Putussibau - Nanga Hovat Hamlet (Bukat Dayak tribe), Datat Diaan Village (Kayan Dayak tribe), Sibau Hulu Village (Taman and Kantu Dayak tribes) and Tanjung Lasa Village (Taman Dayak tribe); and (4) Sub-district of South Putussibau - Bungan Jaya Village and Tanjung Lokang Village (Punan Hovongan Dayak tribe).

Large areas of land would have consequences for the utilization of natural resources. Almost all of the studied areas were the largest in their sub-districts, except Manua Sadap and Labian Ira'ang Villages. The village of Manua Sadap is the smallest in Embaloh Hulu Sub-district, with a total area of 239.79 km² or 6.73% of the whole Embaloh Hulu Sub-district. Datat Diaan, Tanjung Lasa and Sibau Hulu Villages are the three largest out of 19 villages in North Putussibau Sub-district with the largest area of 617 km², 385 km² and 328 km² or equal to 16.91%, 9.34% and 7.96% of the total area of North Putussibau Sub-district. Likewise, from the 16 villages in South Putussibau Sub-district, Bungan Jaya and Tanjung Lokang Villages are two of the three villages with the largest area of 1,984.63 km² and 795.31 km² or equal to 33.97% and 22.19% of the whole area of South Putussibau Sub-district. Labian Ira'ang is an expansion of Mensiau Village with the smallest total area of 38 km² or only 2.85% of the total area of Batang Lupar Sub-district.

Data collected comprised of social, cultural and economic characteristics of the local communities, types of interactions between the communities and the local biodiversity, and the social capital of the local communities. The social capital elements studied were trust, proactive action (social and environmental concerns) and social norms. Data were collected through interviews, field observation and literature study. Interviews were conducted using convenience sampling technique, given the limited time in the field to cover all of the studied areas so as to make use of the easily accessible individuals as respondents. In total, there were 48 respondents including indigenous leaders as informants, as many would prefer the interviews be conducted with their leaders. In addition, interviews with the community leaders were carried out using in-depth interviews.

3. Livelihood strategy

Livelihood strategy refers to the progression of selected events and resources investment to strengthen livelihoods [26]. All communities in the sampled villages showed dependence on dryland farming for their livelihoods (table 1). This was supported by the abundance of available land, as indicated by the low population density. Particularly in Embaloh Hulu Sub-district, based on data from 2011, efforts to clear lands tended to be stable and even declining, while in Batang Lupar Sub-district and in particular in North Putussibau Sub-district, land clearing efforts were increasing [27].

| Location              | Ethnic groups          | Livelihood                                |
|-----------------------|------------------------|-------------------------------------------|
| Sadap Hamlet          | Iban                   | Dryland farming, hunting, fishing and tourism |
| Tanjung Lasa Village  | Taman (majority), Melayu| Dryland farming, hunting (seasonal), gathering of agarwood (gaharu) (occasional), working in Malaysia, rubber tapping |
| Sibau Hulu Village    | Taman, Kantu, Javanese, East Timor | Dryland farming /gardening, rubber tapping and hunting, cattle rearing |
| Datat Diaan Village   | Kayan                  | Dryland farming, fishing, raising         |
| Nanga Hovat Hamlet    | Bukat                  | Dryland farming, gold mining, non-forest products gathering |
| Labian Ira’ang Village| Embaloh (3 hamlets) & Iban (1 hamlet) | Dryland farming, gardening, hunting |
| Mensiau Village       | Iban                   | Dryland farming, hunting, fishing, non-forest products gathering |
| Tanjung Lokang Village| Punan Hovongan         | Hunting, dryland farming, gold mining    |
| Bungan Jaya Village   | Punan Hovongan         | Hunting, fishing, dryland farming, gold mining |
There were three livelihood systems that were apparent in the studied areas, i.e., subsistence, diversified agroforestry and market-based systems, with subsistence as the most vulnerable livelihood system. The subsistence livelihood system was generally found among the shifting cultivators who lived in remote locations, away from markets, low income, and where rice was produced for subsistence purposes. Such system was observed among the Sadap, Sibau Hulu, Bungan Jaya and Tanjung Lokang communities. The majority of the income were obtained from dryland farming, while hunting still formed as important means of livelihood for subsistence families, especially those living far from markets.

The diversified agroforestry system was generally observed among people who practiced agroforestry, and collecting agarwood (gaharu) and those earning cash from the sale of gaharu. The local communities of Mensiau, Labian Ira’ang and Tanjung Lasa Villages were actively engaged in agroforestry. The villagers planted vegetables and rice, except in Mensiau where only rice was planted due to the marginal lands. These villages had previously been subsistence villages but were recently able to sell their own vegetables due to the assistance from the national park in agroforestry practices. Hunting was occasionally conducted, since the people used traps to catch animals in recent times.

The diversified market-based system was dominated by diverse communities with access to commercial markets, high non-farm activities, few income from forest products, and high rice production. The diversified market-based system was observed among the local communities of Mensiau, Labian Ira'ang and Tanjung Lasa Villages. The characteristics of the livelihood system suggested that the local communities living closest to the national park still practiced subsistence livelihood system thus showed higher dependence on the resources within the national park, while other villages within the vicinity of the national park had been engaged in a higher economic mode of livelihood systems through growing their own vegetables and selling them to the markets.

4. Influence of social capital on communities’ attitudes towards biodiversity conservation
The results of social capital studies from all sample villages (table 2-4) showed different social capital based on the three elements of social capital studied, i.e., trust, proactive action & caring for others and the environment, and social norms.

4.1. Trust
In general, the level of trust of the local communities within and in the vicinity of Betung Kerihun National Park was low (table 2). The justifications behind the low level of trust are given below:

| Location                  | Level of trust and justifications                                                                 |
|---------------------------|---------------------------------------------------------------------------------------------------|
| Sadap Hamlet              | Low – the local people were not involved in the NP programmes and the Tourism Service did not respond well to them. |
| Tanjung Lasa Village      | Low – lack of assistance from the NP authority                                                    |
| Sibau Hulu Village        | Low - unjust compensation by NP authority for banned activities                                  |
| Datoh Diaan Village       | Low – the NP authority placed the burden of the area protection on the local communities         |
| Nanga Hovat Hamlet        | Low – limited hunting activities regulated by the authority                                        |
| Labian Ira’ang Village    | High – good relationship related to tourism development                                            |
| Mensiau Village           | High – empowerment programme by the government went well                                           |
| Bungan Jaya Village       | Moderate - moderate concerns from NP authority to reduce conflict between the different tribes in the village |
| Tanjung Lokang Village    | Moderate to high – better relationship with the NP authority                                     |
|                           | Low – no recognition of customs by the NP authority due to the banning of gold mining activity    |
Most of the locals believed that the presence of the NP authority was inefficient and that the authority was unapproachable. The local communities have accepted the existence of Betung Kerihun NP, because they felt the benefits accrued from the protection of the ecological and the economical values of the forest area. Nevertheless, the presence of the NP authority was perceived to have limited their utilizations of the natural resources that they were dependent upon that have been passed down through generations and were actually regulated through the customary law (concerns the laws, practices and customs of indigenous people). Customary law is central to the identity of indigenous people. However, since conservation is often based on policies introduced by the authority that is not local, thus very often the policies included obliging the local people to change their economic activities [28]. Table 2 showed that obligations imposed by the NP authority, such as the banning of certain customary activities and limited number of games that could be hunted on regular basis, had been perceived by the local communities as the NP authority were disrespecting their customs. The local people also felt that their wishes were often not heard or not followed up, yet they felt that they were given too much responsibility to protect the national park. Such perceptions have resulted in the resentment of the local people towards the NP authority and lowered their level of trust.

4.2. Proactive actions
In all the villages surveyed, it was found that the communities still practiced various activities that showed social and environmental concerns (Table 3). For example, the village government of Tanjung Lokang distributed a circle containing the call for people to respect each other and care for the environment.

Table 3. Proactive actions shown by the local communities of Betung Kerihun National Park.

| Location                  | Social and environmental concerns                                                                 |
|---------------------------|---------------------------------------------------------------------------------------------------|
| Sadap Hamlet              | • **High** - The community agreed with government regulations in the prohibition of hunting and harassing orangutans (related to local customary law that they belief when an Iban people die they become orangutans).  |
|                           | • **High** - Community paid monthly dues to buy generator for the hamlet.                         |
|                           | • **High** - Logging activities were no longer existed.                                           |
|                           | • **High** - Farming activities were carried out communally                                       |
| Tanjung Lasa Village      | • **Moderate** - Communities had started to commercialize the hunting and catching of fish, but hunting and fishing were still conducted in ways that did not harm the environment |
| Sibau Hulu Village        | • **Moderate** - Communities had begun commercializing hunting and fish catches                   |
| Datah Diaan Village       | • **High** - Practicing environmentally friendly fishing (customary law existed that prohibit the use of electrical snare for fishing). |
|                           | • **High** - Participated in campaign activity conducted by the NP authority to stop illegal hunting of hornbills. |
|                           | • **High** - Fully supported the government conservation efforts.                                 |
|                           | • **High** - Practice of dryland farming was conducted communally.                                |
| Mensiau Village           | • **Low** - Social care activities was eroding due to the increase of market, hence activities that highlighted harvest sharing were no longer existed. |
|                           | • **High** - Mutual respect was shown between the Iban and Embaloh Dayak, where previously they were in feud. |
4.3. Norms
Social norms were generally well implemented in all villages. Social norms that were still applied through customary law and the existence of a society that still upholds their customs, were able to produce sufficiently strong level of social capital related to concerns for others and concerns for the environment. These social norms had given rise to strict customary use of natural resources by customs, such as for non-forest clearance and the prohibition of using non-traditional methods of farming, hunting and fishing. It is clear that social norms play important roles in the management of common property resources. Strong social norms would enhance collective action (proactive action). Collective actions had been shown for as long as people had managed natural resources [12].

Social norms applied by communities in the buffer villages of betung kerihun NP had been proven to help maintaining the application of a traditional system of natural resource management. Social norms can influence one's attitude to create conservation behaviour, because in social psychology, an individual's actions can be influenced by the actions of others, especially those regulated within society. According to the classic definition by [29], social psychology is an attempt to understand and explain how the thought, feeling, and behaviour of individuals is influenced by the actual, imagined, or implied presence of others. By imagined or implied presence, the effects of social influence can be felt even without the presence of others.

Table 4. Social norms of the local communities of Betung Kerihun National Park.

| Location                  | Social norms                                                                 |
|---------------------------|------------------------------------------------------------------------------|
| Sadap Hamlet              | • High - Certain restriction on animals that cannot be killed due to customary rule and NP authority. |
|                           | • High - Agreed on the prohibition to cut down trees by the NP authority.      |
| Tanjung Lasa Village      | • High - No conflict among member of communities                              |
| Sibau Hulu Village        | • High - Customary law was in line with village regulations                   |
| Datah Diaan Village       | • High - Conflict resolution was done through discussion                      |
|                           | • Moderate - Weakening of customary law implementation.                       |
|                           | • Each problem/conflict would be initially settled by customary institution, prior to resolution through village government. |
| Nanga Hovat Hamlet        | • High - Customary sanction was the same for men and women.                   |
|                           | • High - Both government regulations and customary regulations were practiced.|
| Labian Ira’ang Village    | • High - Still practicing tradition                                           |
| Mensiau Village           | • High - The Iban and Embaloh were in mutual trust                            |
| Bungan Jaya Village       | • High - All activities were regulated by the customary law.                  |
|                           | • High - Land clearance was initiated with discussion.                        |
| Tanjung Lokang Village    | • High - Very obedient to custom                                              |
|                           | • High - Forest resources extraction was regulated by custom.                 |
|                           | • High - All natural resources utilization and management were regulated by customary law. |
|                           | • High - The applied social norms was the Punan Hovongan norms.              |
|                           | • High - Visitors must be accompanied by a member of the local community     |
Various authors [30-32] agree that when the local knowledge is incorporated in the conservation and development activities, they are more likely to sustain stewardship and protection over the long term. This highlighted the importance of the social connectedness as an important assets is gaining importance. As discussed above, the low level of trust might hinder the involvement of the local community in biodiversity conservation, yet social norms were seen by various authors [12, 33] as able to develop collective actions oriented towards biodiversity conservation. Therefore it is important to further analyse these social capital elements with regard to their roles in biodiversity conservation.

The analysis of the relationship between the perceived benefits of the community through the existence of the national park (table 5) and social capital have indicated that social cohesion, customs and social integration were strongly influenced by the attitude of community conservation.

**Table 5.** Perceptions of the impacts of NP existence on livelihood strategies.

| Livelihood strategy | Impacts of the existence of Betung Kerihun National Park | Perceptions |
|---------------------|----------------------------------------------------------|-------------|
| Dryland farming     | Land located outside the NP, thus no impacts             | Positive    |
| Hunting             | Limited number of allowable game by the NP authority     | Moderate    |
| Fishing             | Fulfilling daily needs                                   | Neutral to Positive |
| Gardening           | NP provided assistance                                   | Positive    |
|                     | Increased income                                         |             |
| Cattle raising      | NP provided assistance                                   | Moderate    |
|                     | Without extension programme, cattle raising could fail    |             |
| Gold mining         | Limited gold mining activity allowed by the NP authority | Negative    |
| Tourism             | Increase of income was not as expected                   | Positive to negative |
|                     | Uneven distribution of income                            |             |
|                     | The focus of tourism was still on the NP not yet on the villages |         |
|                     | Helping taking care of the environment including forest and river | |
Communities that supported and related well to the NP, tended to be less dependent on the national park area. These results could help the NP authority to formulate specific activities that could promote the conservation of biodiversity of Betung Kerihun National Park. These results indicated that improving social commitment and social support were effective ways to increase joint action in the conservation of the park. The results of the above analysis also concluded that the level of public confidence in the management of the park was influenced by the access provided by the park in the utilization of natural resources that have customary significance and were activities that had been passed down on generations. Any regulations or activities of the NP authority that limit the use of natural resources within the national park, and had not taken customary law or customs into consideration, would create negative attitudes towards the authority. On the other hand, any activities or regulations that supported the conservation of the natural resources of the NP would gain positive participation of the people.

Research findings suggested that the customary variables embodied in social norms showed positive relationships with community participation in conservation activities carried out in the village. For example, through the setting/banning of certain species of wildlife that can be hunted, hunted only when needed, forest clearance etc., which were governed by customary laws as justified in village regulations. These customary laws were capable of providing sustainable hunting animals, because until now, none of the people complained on the decline in the number of games. Other wildlife utilization that were observed, included the use of wildlife as food, shown mainly with wild boars, fish and deer, also mouse deer. The community of Labian Ira'ang Village also utilized snakes and red ants as ingredients for traditional medicines, while the people of Nanga Hovat Village used snake for traditional medicine. Several wildlife were protected by custom, included deer and hornbills (Datah Diaan Village) and orangutans (Mensiau Village). In Tanjung Lokang Village, gibbon, long-tailed macaques and pig-tailed macaques were often became pests, as when they invaded the field, their numbers could reach dozens of individuals.

The results of this research showed that if Betung Kerihun National Park authority could understand and pay attention to the social needs of the local communities and in turn, the communities could understand the benefits of conservation that received from the NP, they would tend to undertake conservation and biodiversity efforts. Field evidence found several wildlife that were kept as pets, suggesting that some of the local people still did not understand the biodiversity conservation function of the national park, although according to the owners, they were kept for pleasure not for trade purposes.

5. Conclusion
In general, the level of trust of the local communities within and around Betung Kerihun National Park was low. Most of the locals believed that the presence of the NP authority was inefficient and that the authority was unapproachable. The local communities actually accepted the existence of Betung Kerihun NP, because they felt the benefits accrued from the protection of the ecological and the economical values of the forest area, but the presence of the NP authority was perceived to have limited their utilizations of the natural resources that they were dependent upon and have been passed down by generations, which were organized through the customary rules/regulations.

Social norms were generally still well implemented in all of the villages. In all of the villages surveyed, it was found that the communities were still practicing activities that showed social and environmental concerns. However, obstacle such as difficult access to the area, as well as the strength of customary rules, had reduced the acceptance of the outsiders. In addition, the buffer communities tended to trust people from the same tribe.

On the contrary to other research findings in literatures that suggested trust as the dominant social capital element in an effective management of an area, this research found that despite the low level of trust that the local communities showed towards the NP authority, the local people supported the conservation of the biodiversity within the national park due to their social norms/beliefs. Customary law, as the constituent of social norms, in this case, was a more important determinant factor than
trust, in the successful conservation of the park. The indigenous people of the Betung Kerihun regarded the national park as an entity worthy of protection and respect, not just as a resource.

Understanding the social dynamics and respect for customary law, is an effective way to increase the community participation in biodiversity conservation of the park. This highlighted the importance of networking, such as strengthening local institutions, local associations, etc. The existence of local organizations could assist community participation in biodiversity conservation activities. The limitation in this study is the measurement of the level of social capital was not using quantitative methods, but qualitative measures based on results analysis in the field.

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