Conflict management approaches under unclear boundaries of the commons: Experiences from Danau Sentarum National Park, West Kalimantan

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Abstract

Conflict in common pool resource management is ubiquitous. As a result, the call for conflict management has increased during the past decades. The "ideal" goal in conflict management is to achieve positive changes and avoid unnecessary escalation to destructive levels. While it has been argued that the role of local institutions in conflict management is central, little is known about how these institutions could actually deal with conflict. In this paper, we highlight how local institutions respond to the various inter-settlement conflicts over the issue of unclear resource boundaries in Danau Sentarum National Park (DNSP). We discuss conflict management approaches taken by the *Dayak* and the *Malay* ethnic groups in response to forestry and fishery conflicts and consider their effectiveness. We also demonstrate how customary laws are used in conflict management. We identify gaps in these approaches and discuss several possible ways forward. We argue that enhancing communication and developing a mechanism of exchange among various ethnic groups will allow better understanding of different and often contradicting customary laws. We also propose a kind of co-management arrangement among stakeholders (e.g., park management, local people, governments and NGOs) to ensure the sustainability of the park and to constructively manage the ever increasing conflict among these stakeholders.

Keywords: Conflict management, customary laws, Danau Sentarum National Park, forest management, fishery management

Introduction

The term "conflict" is familiar to everyone. It is an emotive term that provokes various images or associations amongst people. Some might think of a fight between two people, or even war among nations. Still others think of conflict as a kind of disagreement, for instance, between husband and wife or between two neighboring communities. The term conflict has been used to interpret many different things and for many different purposes. As with all concepts in social sciences a bewildering variety of definitions co-exist (Deutsch, 1973; Wall and Callister, 1995). Pondy (1966) described conflict as a concept of many meanings and for the most part a "rubber concept", being stretched and molded for the purpose at hand and covering seemingly everything from war to choices between ice-cream and sodas or sundaes. Walker and Daniels (1997) and Daniels and Walker (2001) compiled definitions of conflict derived from major conflict studies by leading scholars concluding that all social conflicts are based on differences in certain things such as interest, value, perception, position, power and goals.

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While conflict definition based on differences is commonly accepted, Glasl (1997; 1999) makes a further refinement of the definition. He suggests that conflict only occurs if an actor feels "impairment" from the behaviour of another actor because they have different perceptions, emotions and interests. Differences in things such as interests, perceptions, goals and emotions are accepted as normal aspects of our lives and cannot be equated to conflict. The experience of an actor's behavior as impairment or restriction becomes a prerequisite for conflict, thereby providing a clear criterion to distinct conflict from non-conflict situations.

In the management of common pool resources conflict is ubiquitous (Ayling and Kelly, 1990; Ostrom, 1990; Hellstrom, 2001, Adams, et al, 2003). Moreover, recently the incidence of conflict in resource management has increased, often involving violence (e.g., Alston, 2000; Peluso and Watt, 2001). Due to these reasons studies on common pool resource conflict have expanded rapidly. Several common impairments are highlighted; for instance, competition over access due to unclear boundaries, resource scarcity and legal pluralism; environmental pollution; corrupt leadership; and contested management priority including cultural aspects (Yasmi and Schanz, in press).

Conflicts over access to land for agricultural and other productive uses are commonly found at forest frontiers and mainly attributed to the absence of clear boundaries (e.g., Fred-Mensah, 1999; Hotte, 2001). If boundaries are in place they are often contested or interpreted differently (e.g., Wollenberg et al., 2002). Second, access to resources becomes more important when resources are depleted or limited in terms of their amount. Demographic pressures increase the competition for the resources (Homer-Dixon, 1999). Third, NRM and access are often defined by different set of rules and regulations (e.g., formal and informal). Very often these rules and regulations contradict each other. If these contradictions make certain group feels their tenure over land is being contested, conflict will follow (e.g., Alston, 2000).

Due to the presence of common pool resource conflict the call for its management has increased. Conflict management is increasingly viewed as an inseparable aspect in common pool resource management. In a broad sense, it includes all activities that have the intention to reduce or solve the conflict (Deutsch, 1973; Wall and Callister, 1995). Because many argue that conflict has both positive and negative sides, the "ideal" goal in conflict management is to attain desirable positive outcomes and reduce/eliminate escalation to unnecessary, destructive levels (e.g., Deutsch, 1973; Kriesberg, 1998; Daniels and Walker, 2001). It is often argued that conflict management has to mobilize local capacity through the use of various local approaches such as customary laws and regulations, negotiation skills and persuasive knowledge (FAO, 2000). Local response to conflict is seen as the first and quickest available conflict management strategy. Increasingly, it is also argued that outside help (external assistance) should not be used as the major conflict management strategy because stakeholders at local level know best their conflict situation. According to Glasl (1999), external assistance is only secondary and necessary once local skills can no longer function effectively.

In practice, the "ideal" goal of conflict management can be achieved under some circumstances (e.g., strong local institutions, low resource competition, clear resource boundaries). However, very often it also proves difficult to accomplish. The problem is how to manage the ever

increasing conflict in the management of common pool resources so that it yields positive outcomes. We too have to question what kinds of management approaches and local capacities are available for constructive conflict management and how we can strengthen and institutionalize these capacities. We must also seek explanations for why in some cases local conflict management approaches do not function as intended and how we can address the gaps between the "ideal" goal of conflict management and the reality on the ground.

Against this theoretical background, we describe a case of conflict over unclear boundaries of the commons (i.e., forestry and fishery management) involving various stakeholders. We will discuss how different stakeholders perceive this impairment in the course of the conflict. Subsequently, we elaborate conflict management approaches or strategies taken by conflicting parties in addressing the conflict. We then evaluate to what extent these approaches have been effective and identify some possible ways for their improvements.

Research location and stakeholder groups

This study was carried out in Danau Sentarum National Park (DNSP), West Kalimantan. It is located in the upper Kapuas river basin near the border with Malaysia, 700 km east of Pontianak, the capital of West Kalimantan (Giesen, 1996; Anshari et al, 2001). DSNP covers an area of approximately 132,000 ha involving three major lakes and several small lakes inter-connected by a network of rivers. Initially, in 1982, some 80,000 ha of the DSNP had already been proclaimed as Wildlife Reserve by the Government of Indonesia. Due to its ecological uniqueness, in 1994, the area was registered as a Ramsar site (Gieson, 1996; Anshari et al, 2005). Since 4 February 1999, the area has been extended further to form a National Park covering the previously designated Wildlife Reserve area and some extension to its surrounding vicinity.

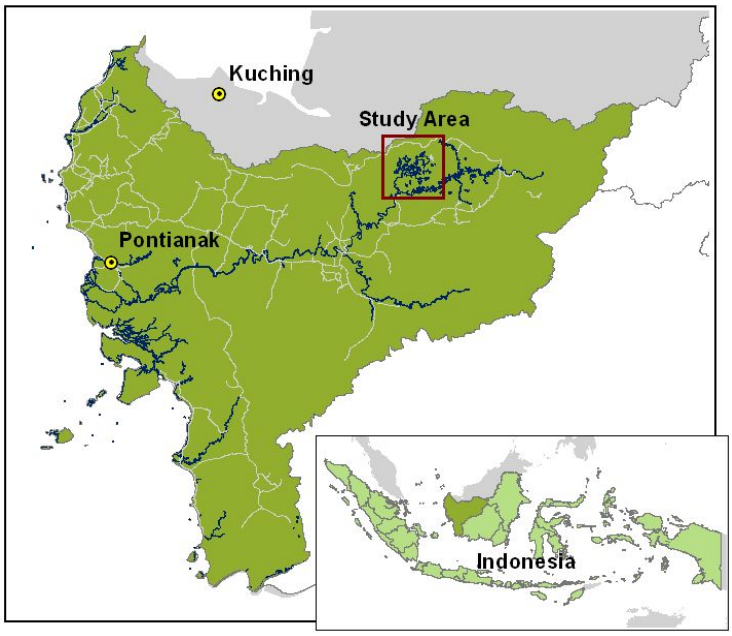

Figure 1. Location of Danau Sentarum National Park

DSNP is an area of open lakes, seasonally flooded peat and freshwater swamp forest, and lowland hill forest (Giesen, 1996; Colfer and Wadley, 1999; Dennis et al, 2000; Anshari et al, 2001). Ninety-five percent of the area is inundated during flood season creating a network of rivers and lakes. During the dry season there is an average 12 m drop in water level (Adger and Luttrell, 2000). Two general types of forests are found in DSNP: swamp forests and dryland forests. Dryland forest generally occurs on the hills, which range in height from 140 to 750 m, and on the undulating uplands in the northern and eastern part of the park area (Peters, 1994; Dennis et al, 2000). Forests within and around the park are said to accommodate many important species. The park is home to 500 tree species, 260 fish species, 250 bird species, 3 orangutan species, long tail monkeys, 3 species of crocodiles, proboscis monkeys (Giesen and Aglionby, 2000). Due to its richness in biodiversity and also because of many threats to its sustainability (e.g., illegal logging, fire, etc), DSNP is one of the most important and unique conservation areas in Indonesia.

Two major ethnic groups (the *Dayak* and the *Malay*) live within and surrounding the park whose livelihood is highly dependant on the resources within the park (Agliongby, 1996; Harwell, 1997). The *Dayaks*, who mostly live in traditional longhouses, occupy the uppermost area of the river basin and live on high land as shifting cultivators. Although the *Dayaks* fish occasionally along the river and around the lakes, fishing is not their major livelihood. They are mainly farmersn (shifting cultivators) who plant rice and other crops. The *Dayaks* nowadays live permanently in longhouses and practice shifting cultivation which they have long inherited from their ancestors (Wadley, 1997). On the other hand, the *Malays* reside downstream around the lakes and along the rivers (Wickham et al, 1997). The *Malays* are mainly fishers who are dependant almost exclusively on fishing for their livelihood. They are one of the major fish producers in West Kalimantan as they supply 60% of the fresh water fish in the province (Heri, 2005). According to Erman and Heri (2005) there are 75 settlements within the park both permanent and seasonal settlements. The *Malays* occupy the majority of settlements around the lake and downstream rivers.

Methods

In this study we collected data related to stakeholders' perceptions on the following three broad themes:

1. the major impairments involved in each conflict.
2. approaches used in addressing the various inter-settlement conflicts
3. the effectiveness of conflict management approaches.

We used three data collection techniques: semi-structured interviews, focus group discussions (FGD) and a multi-stakeholder workshop. Over the period of our fieldwork between August and December 2005, we also conducted many informal interviews and field observations that allowed us to get a better understanding of types of conflict and issues involved in those conflicts. In addition, Secondary data, such as previous work in the area, were used to supplement our findings.

We interviewed thirty one key informants selected based on a snowball sampling technique (Bernard, 2002). We chose this technique because the issues that we investigated were sensitive, and not everyone was willing to be interviewed. We firstly interviewed three customary (*adat*) leaders and one NGO member and then we asked them to recommend other people for subsequent interviews. In addition, we purposely selected key informants from outside the community whom we considered as the stakeholders in DSNP such as park officials, forestry officials, NGOs, university lecturers and researchers who used to work, or are still working, in DSNP. Although we only interviewed thirty one respondents, one of the authors is the native Dayak from DSNP and has been working as community facilitator for more than 15 years in the area. In addition, another one of the authors spent about 15 months in the area to work with the community since 1990s and has revisited the area twice since then. With all these expertise and background, we hope the results we present here will be robust enough.

Table 1. Characteristics of respondents

Characteristics	Number
1. Origin	
• *Malay*	11
• *Dayak*	6
• Others (e.g., park officials, government, NGOs, researchers)	14
2. Occupation	
• Farmer	6
• Fishermen	11
• NGO	5
• Researcher/lecturer	3
• Government officials (district forest service, park officials)	6
3. Gender	
• Male	28
• Female	3

[Note: Due to the sensitivity of the issue involved in this research, it was difficult to get female respondents. Many women said that they did not know about the conflict or they did not want to share information with us. They often argued that their husbands or customary leaders were more knowledgeable and appropriate to be consulted on the issue]

FGDs were carried out once in the *Malay* settlement and once in the *Dayak* settlement. A Multi-stakeholder workshop was held from 29-30 September in the capital district attended by 40 people from almost all stakeholder groups, such as Park Management, local communities, local governments, NGOs, researchers and people who had worked previously in DSNP (i.e., from the Asian Wetlands Bureau[4]). During the workshop, many issues were discussed including the increasing inter-settlement conflict in the area.

[4] It began with Asian Wetlands Bureau, which later changed to Wetlands International-Indonesia Programme. The project started in 1992, under ODA, and later was taken over by DFID.

The "politics" behind the contested boundaries: legal pluralism, economic interest and the nature of conflict in DNSP

Legal pluralisms

From a (formal) legal perspective the national park is under the jurisdiction of the central government. According to the Indonesian Forestry Law (Law No. 41/1999) the national park is categorized as a highly restricted conservation area. A National park should have three different zones with different restrictions regarding the use of resources in each zone. They include core, utilization and buffer zones. The core zone is primarily allocated for conservation; it must not be occupied by settlement and no extractive activities are allowed. Within the utilization zone limited extractive activities, such as extraction of non timber forest products (NTFPs) and hunting, are allowed. In the buffer zone settlements and agricultural activities are permitted. In DSNP, as in most Indonesian national parks, this zoning system is ineffectively implemented. The three zones are rarely clearly demarcated. It is commonly known that they are artificially made or created by people in Jakarta without prior visits to, and proper knowledge of, park locations.

It is not surprising in Indonesia though to find many settlements, agricultural and extractive activities in the core zone of a national park such as DSNP. *De facto* extractive activities, agricultural expansion and settlements often overlap with this zoning system. In the case of DNSP although many people recognize the status of the park they are generally not aware of the different zones. Since its declaration as a national park DNSP has not been properly managed by the government. Dennis states, "…. management by the Department of Conservation remains minimal with only two rangers occasionally stationed in the area. The local communities who live in the Park remain the *de facto* managers of the area." (Dennis et al 2000: p7).

Although from the perspective of formal laws many settlements in DSNP can be considered illegal, historically local communities have been the major users of the area. Even before the area was assigned as a national park, they already lived there. Beside the legal legislation, two other resource regulation traditions or regulatory regimes co-exist (Padoch, 1992; Adger and Luttrell, 2000):

- utilization by the *Dayak* who practice shifting cultivation and forest management in the encircling hills, and view the lowland lake area as their own 'back-yard'.
- the management of the lowland lake area by the predominantly *Malay* fisherfolk under usufruct rights recognized by the *Dayak*. These people are relatively new arrivals to the area and depend upon both fish and forest products.

Both the *Malay* and the *Dayak* have their customary laws (locally known as *hukum adat*) that regulate resource use and extraction. Even each single settlement within the *Malay* and the *Dayak* has its specific rules and regulations on fishing and forest product extraction (Harwell, 1997).

Forestry conflict

For a long time the different rules and regulations have induced conflict among settlements in DSNP. Unclear boundaries of "settlements" and "working areas" have long been the primary source of impairment in the conflict. Recently, conflict emerged with even higher intensity.

Unclear and vague boundaries of forest area brought many settlements into a conflict situation. Although there have been several initiatives led by Asian Wetland Bureau (now Wetlands International) and Overseas Development Agency (now UK-DfID) and local NGOs to define boundaries in the past, in practice, those boundaries remain unclear.

The change in the socio-political system in Indonesia after the fall of Soeharto's regime in 1998 has intensified illegal logging in DSNP. The main *modus operandi* was investors, mostly from neighboring Malaysia, who made agreements with different settlements through their leaders to log their forests and in return receive fees and development assistance such as a mosque (in *Malay* settlements) and longhouse renovations (in *Dayak* settlements). Conflict emerged because boundaries between neighboring settlements were never clearly demarcated. Boundaries for the most part were defined by natural signs such as a hill, river, big trees, etc. Very often the same hill was claimed by two or more settlements resulting in heated disputes over the exact division of forest area. The problem became even more complicated because sometimes two neighboring settlements have not identified their boundaries at all. For instance, in some circumstances two neighboring settlements originated from a single family root but due to the increasing number of households and demand for more working area some of them moved to form a new settlement next to the original. In this case boundaries between the two were not very obvious. Not to mention that logging activities were done without previously mapping the area. As a result, it was often the case where one settlement blamed its neighbor for cutting trees inside its territory and vice versa. This kind of conflict occurred frequently in both *Malay* and *Dayak* settlements and seemed to increase after the fall of the Soeharto regime.

One of the respondents explained, "In the past these two settlements never fought each other. We are actually originated from one family. Now, because the possibility to cut trees from the forests is open, they started to talk about boundaries. One settlement wants to claim bigger forest area than the other because they want to get more money from selling these trees. In the past they never thought seriously about the boundaries because it was difficult to cut the forests given the fact that people were afraid for being caught by the military. Now every settlement can sell their forest to Malaysia. Jealousy from our neighbors develops as we get more fees compared to them and our mosque is being renovated by the timber investor from Malaysia." (taken from interview excerpt). It seems that economic interest over timber explains the inter-settlement conflicts in DSNP as highlighted by respondents.

Table 2. Examples of inter-settlement forestry conflicts in DSNP

Conflicting settlement	Ethnic group	Main issue
Tempurau vs. Semalah	Both are *Malay*	According to history, Tempurau and Semalah used to be one settlement. Later on, Tempurau was founded as a new settlement next to Semalah. Because Tempurau had little/no working area, Semalah people generously awarded them some of their area. In this conflict, people from Tempurau cut trees from the forest of Semalah, beyond their own working area.
Sungai Pelaik vs. Meliau	Both are *Dayak*	People of Sungai Pelaik agreed with an investor from Malaysia to cut trees within their forest. In return, the investor paid certain fees and helped renovate their longhouse. In the operation the investor hired people from Sambas (another district in West Kalimantan whose people are well known as the best loggers in the area) to fell trees

		within Sungai Pelaik's forest. A conflict started when Meliau confiscated several chainsaws from those loggers accusing them to have entered Meliau's forest. For that incident, people of Meliau asked Sungai Pelaik to pay for all the trees felled in their area and also reimbursement for the chainsaws. However, Sungai Pelaik refused and conflict escalated.

There are many other similar types of conflict that occurred between settlements in DSNP (see e.g., Anshari et al, 2005; Erman and Heri, 2005; Nina, 2006). The impairment was almost the same, i.e., unclear boundaries of forest areas and the race for economic profits. For instance, the following settlements engaged in more or less the same kind of conflict with the same *modus operandi*: Pengembung and Genting, Pega and Sekulat, and Tangit 2 and Tangit 4.

Fishery conflict

Fishery conflict also frequently revolves around unclear boundaries of working areas among fishing settlements. In a very broad sense, the fishing area of different settlements is normally recognized and divided according to different river systems. The division is normally as follows: settlement A has working area along River X and B has working area along River Y, and so on. These boundaries are not very strict and sometimes quite confusing too. Conflict normally emerges if someone enters a fishing area of another settlement without permission. Usually, when a person asks permission, the customary leaders would allow him to fish following the regulations applied in that particular settlement.

A more complicated issue is the boundaries of fishing areas over a particular lake. For instance, both Leboyan and Lanjak settlements share the fishing area on the same lake. In such a case, boundaries cannot be defined very easily. As a result of the vagueness of the boundaries conflict between Lanjak and Leboyan has often been reported. It became more serious if those who violated the boundaries used fishing gears forbidden by a particular settlement. For instance, a respondent said, "In Danau Sentarum Nantional Park there are a lot of fishing settlements. A major issue is that *adat* (customary) regulations in one settlement very often contradict those in other settlements. For instance, settlement A allows *pukat* (gillnet) while its neighbors forbid it. Due to differences in their fishing regulations conflict often occurs."

Furthermore, many respondents also said that nowadays the fish stock has decreased dramatically. They often complained about the low amount of fish they could catch these days. They said, in the past they only needed to go fishing for two or three hours and they could go home with a canoe full of fish. During the past few years they have been fishing for the whole day but still they do not get much. Perhaps due to the decreasing fish stock as claimed by many fishers and the increasing number of households in the area the issue of boundaries of fishing areas has become more and more relevant.

Table 3. Examples of inter-settlement fishery conflicts in DSNP

Conflicting parties (settlements)	Ethnic group	Main issue
Meliau vs. Semalah/Tempurau	Meliau is *Dayak* and Semalah/Tempurau are *Malay*	People from Semalah/Tempurau very often go fishing in the river that belongs to Meliau. Most of those people use *jermal* (small mesh funnel net) and *pukat* (gillnet) which are

		forbidden according to Meliau's customary law. In many occasions Meliau confiscated their fishing gear, their boats and also applied sanctions.
Sekulat vs. Pega	Both are *Malay*	People from Sekulat entered the fishing area of Pega without permission and used a certain size of *jermal* (small mesh funnel net) that is forbidden in the area of Pega. The conflict heated up because Sekulat argued that the area where they used *jermal* was their area not Pega's.

Conflict over fishing areas and the use of different fishing gear were very common in DSNP and up until now continue to be a "hot" issue. Some settlements have tried to discuss the problem and define the boundaries of their fishing area, e.g., between Leboyan and Semangit, between Pengembung and Genting, etc. Although these settlements have agreed on boundaries, some people still breach them, for instance, by putting *jermal* in the evening and then moving it away very early in the morning before it is seen.

Another type of fishery conflict often heard in the area was conflict between the *Dayak* and the *Malay*. For the *Dayak*, although they seldom fish commercially, some of them use poison for catching fish and fresh water turtles. Poison used upstream can kill fish downstream and in particular the *Malays* complain that it also kills their caged fish. Although the *Malays* have complained a lot about the poison, the *Dayak* still use it on occasion. On the other hand, fishery conflict between *Dayak* settlements was not often heard.

Conflict management approaches under unclear resource boundaries

Conflict management approach in forestry

Most of the forestry conflicts in DSNP were resolved based on customary laws (*dapt*). Conflict management through *dapt* normally exhibits the dominant role of *dapt* leaders. These leaders are highly respected by the community members and they have special social status. People often refer to *dapt* leaders as their "parents" or people that they collectively recognize to have higher social status and wisdom. Showing overt respect to these leaders is a generally accepted norm and a must. *Adat* leaders also function as representatives of the community when dealing with outsiders, such as government and timber investors. Due to the high status of *dapt* leaders conflict management approaches and processes are significantly influenced by them. Both the *Malay* and *Dayak* resolve forestry conflict through customary laws relying on these leaders. Nevertheless, the approaches and processes differ substantially.

In the *Malay* context, *adat* leaders are normally the heads of fishermen; each settlement has one *adat* leader. Those heads of fishermen ate normally elected for a particular term such as every four or five years. The term is quite flexible and delays in the election often occur. A person can be re-elected several times as long he is willing to serve as the *adat* leader.

Generally when two Malay settlements engage in forestry conflict, leaders from these two settlements will convene a meeting to discuss and find the best solution. The discussion between these leaders is normally based on "good" intentions and based on the assumption that all the *Malays* in DSNP are one big family. This kind of assumption is common among the *Malay*

throughout the park. The repercussions of this are that when they engage in a conflict, leaders will seek a way to solve the problem in a "nice" way. In this way, as far as possible confrontation and escalation of the conflict will be avoided. However, in some cases forestry conflicts did escalate and get worse. Figure 2 illustrates a generalized picture of how forestry conflicts are addressed by the *Malays* based on our observation and interviews in the following nine settlements: Pengembung, Pega, Tekenang, Genting, Sekulat, Leboyan, Semangit, Semalah, and Tempurau.

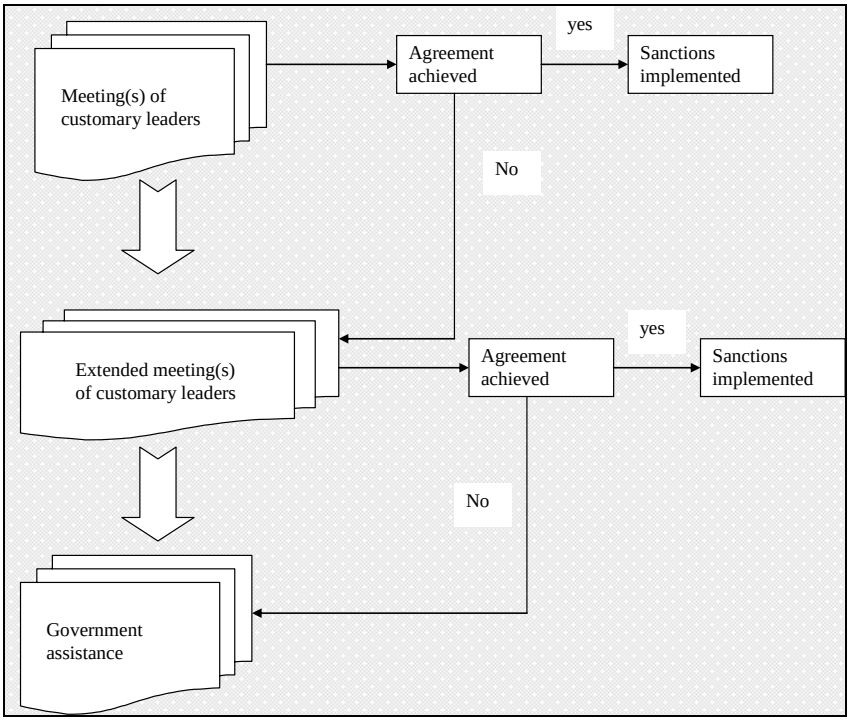

Figure 2. Forestry conflict management approaches among the *Malay*

First, customary leaders from the two conflicting settlements held a meeting to clarify "impairment" involved in the conflict. In this case it was about forest boundaries. One respondent said, "The conflict here is all about boundaries. But you should know that the hidden motive behind boundary disputes is the race for timber" (interview excerpt). If the first meeting does not succeed the leaders will convene more meetings. In these meetings customary leaders will contest the exact boundaries between the two settlements. If compromise cannot be accomplished they will go to the next step of negotiation ("extended meeting(s) of customary leaders").

In this meeting(s) customary leaders from both settlements are accompanied by other prominent people, such as previous customary leaders, religious leaders and elders. The content of discussion is still on boundaries. During this meeting elders will be asked to tell the history of the boundaries. Sometimes elders will be required to do this under the oath. This meeting(s) sometimes can last for weeks and months until they can agree on the exact boundaries. If they

can reach agreement over the boundaries, they will then come into a session where sanctions are applied. For instance, Pengembung acknowledged that they had cut trees in the forest of Genting. The consequence was that Pengembung would have to accept the fine as regulated by the customary laws of Genting. In this case the fine was 1 million Rupiah per tree they cut (approximately $ 120/tree). The total amount of the fine that Pengembung had to pay was 20 million Rupiah ($ 2, 400). On the other hand, in the case where no agreement is reached, conflict management will go to the next step ("government assistance").

If the above processes end in a deadlock, the two settlements involved in conflict seek help from local governments. They report the case to the sub-district government by sending a formal letter. The sub-district government then convenes a meeting involving leaders from both settlements at its office and try to find a solution. For instance, in the case of conflict between Pega and Sekulat, after a meeting sub-district government sent a team to help the two settlements establish their boundaries. The team together with both settlements defined coordinates of the boundaries using GPS. However, during the survey, Sekulat could not agree with the boundaries as they argued that the boundaries should be located closer to Pega. This case was then extended and reported to the district government because Sekulat could not accept the solution provided by thesub-district government. At this point, Sekulat proved the boundaries by presenting an old document that explained the borders of its territory with other settlements, including Pega. Based on this the government imposed the boundaries explained in the document. The consequence was that Pega had to pay a fine to Sekulat for all the trees that they had cut from Sekulat's forest. When we did the fieldwork, Pega still owed some of the fine to Sekulat.

The *Dayak* conflict management approaches follow different procedures. The *Dayaks* have at least four steps of conflict management as depicted in Figure 3. These steps are based on the *Dayak*'s tradition of conflict management that they still adhered to until recently.

The *Dayaks* of DSNP have a hierarchical leadership system which highly influences conflict management approaches. A settlement is typically composed by a single longhouse. The size of the longhouse differs from one settlement to the others. A small longhouse might consist of nine to fifteen households, while a big longhouse can accommodate up to seventy households. Each long house has one customary leader called *tue rumah*. A higher customary leader is called *patih* and he heads several adjacent longhouses. There is no exact rule on how many longhouses are under the leadership of a *patih*. In some circumstances the *patih* might only rule two longhouses but in the others a *patih* might rule four to six longhouses or more. Above the *patih* there is another leader called *temenggung*. He is the leader of several *patihs.* Again, there is no clear guideline of how many *patihs* are under the rule of a *temenggung*.

In forestry conflict management, this hierarchical structure is used as a basis for channeling conflict management procedures. Thus, if two settlements come into conflict the first step is for the *tue rumah* from the two settlements to hold a meeting. For instance in the conflict between Sungai Pelaik and Meliau, the *tue rumah* from both settlements played a major role in solving the problem. Several meetings between them were held both in Sungai Pelaik and in Meliau. These meetings failed to reach a solution to the conflict because each side continued to dispute the boundaries and wanted to have a bigger forest area. At that time, Sungai Pelaik had already given permission to a timber company from Malaysia to log its forest. Meliau posed a strong

protest because the company was said to also cut in Meliau's customary forest. Sungai Pelaik, on the other hand, contended that the part of the forest claimed by Meliau as theirs belonged to Sungai Pelaik. As the dispute developed, people from Meliau confiscated several chainsaws from loggers who operated in the forest and asked for a halt in the logging operation. Up to this point, *tue rumah* from both sides came into a prolonged discussion and negotiation. Unfortunately, the problem was not solved.

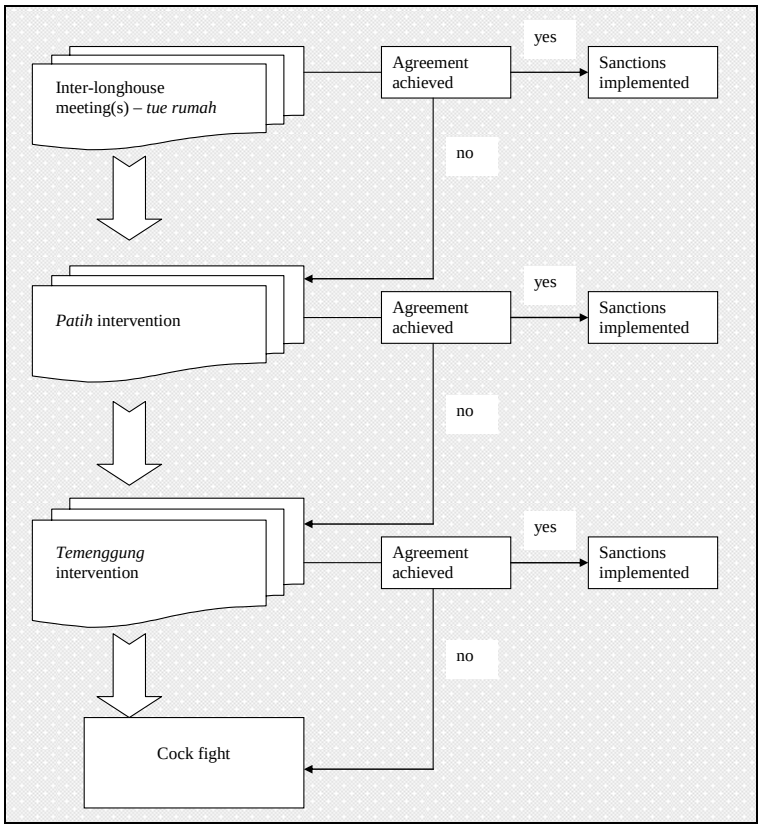

Figure 3. Forestry conflict management approaches in the *Dayak*

Both settlements agreed to bring the case to the higher level, i.e., the *patih.* Many of them hoped that the *patih* could bring a solution to them. The *patih* held several meetings and ended up with no solution as both parties stuck to their original stands; none of them could accept the boundaries. The *patih* then called in the help of the *Temenggung*, the higher customary leader. With his wisdom, the *temenggung* offered a solution to divide the disputed forest equally into two parts. However, Meliau refused because according to Meliau's perspective it was not fair to divide the disputed area equally. They claimed that they were the first founders of the area and that Sungai Pelaik came in long after they had settled there. They said that the forest area of Sungai Pelaik was originally part of Meliau's customary forest. With generosity their ancestors gave part of the forest to Sungai Pelaik. Meliau people were very disappointed as they saw Sungai Pelaik permitted a logging company to log beyond the original area given to them. Up to this point both parties could not reach any agreement/solution as offered by the *temenggung*.

According to their tradition (*adat)* if the t*emenggung* cannot settle a dispute then they have to decide it through a cockfight, the ultimate conflict management procedure.

In the *Dayak*'s tradition the cockfight is the last resort for conflict management. They believe that truth cannot be denied. And through a cockfight the truth will be revealed and the "liar" will be uncovered. The agreement between Meliau and Sungai Pelaik to solve the problem through a cockfight became a hot issue as it spread out very quickly to other *Dayak* settlements. Every *Dayak* person believes that no matter how strong and big the cock is, if they lie the cock will be beaten during the fight. Nevertheless, preparation for the cockfight made the two settlements very busy. Both of them struggled to find the "best fighting cock". Once they found their best cocks, they kept the cocks for a few days and fed them with the best food. Rituals and offerings were conducted to ask for the blessing of their ancestor's spirits. The cocks were presented to the spirits and blessings were asked. Prayers were said day and night until the day of the cockfight. When the day came, all people from both settlements plus people from other settlements came to witness the fight. A particular area approximately 3x4 meters was prepared and fenced for the fight. People gathered around this area.

The cockfight was then executed and won by Sungai Pelaik. Some of the respondents told us that the fight did not last more than five minutes and Meliau's cock was quickly covered in blood and then died. With this fight, it was clear that Meliau had to accept the boundaries as claimed by Sungai Pelaik. It was a final decision and no one could ever refuse. As a consequence, the previously confiscated chainsaws were returned to Sungai Pelaik and Sungai Pelaik did not have to pay the fine as previously requested by Meliau.

Conflict management approach in fishery

We indicated earlier that fishery management is dominated by the *Malays* who live downstream along the major rivers and lakes. For the *Malay* fishing is their major livelihood. With this in mind, fishery conflict in DSNP reflects primarily conflict between different *Malay* settlements. However, to a limited extent conflict between the *Dayak* and the *Malay* also occurs as discussed earlier, for instance between Meliau and its *Malay* neighbors on boundaries and also between the *Dayak* and the *Malay* on using poison to catch fish and fresh water turtle.

In addressing these conflicts, the role of the head fisherman was very prominent. Fishery conflict between the *Dayak* and the *Malay* was normally resolved through discussion between the head fishermen. In many cases the discussion between these leaders resulted in a settlement although some of these conflicts did reoccur. During our observation and interviews, the *Dayak* and the *Malay* fishery conflicts did not escalate to a high level of intensity as most of them could be resolved through direct negotiation.

In the case of inter-settlement conflict of the *Malay*, the procedure for conflict resolution exhibits more or less similar/identical processes as those in forestry conflict management (Figure 2). The difference only lies in its sanctions. For instance, in the forestry conflict normally the sanctions are in the form of money but in fishery conflict while the sanction can also be in terms of money, some settlements like Leboyan and Semangit also put sanctions in terms of destruction of fishing gear. Leboyan, for instance, had confiscated the *pukat* of Lanjak's fishermen several times and then burnt them. According to Leboyan's customary law, burning fishing gear is allowed and

intended to make those violating its territory and customary laws afraid to repeat such actions in the future.

Effectiveness of conflict management approaches

The perception of stakeholders of the effectiveness of conflict management in DSNP as demonstrated above is quite mixed. Although in some conflict cases agreements could be reached and sanctions were imposed[5], stakeholders perceived that the outcomes of conflict management as such were not optimal/effective. In forestry conflict between Sungai Pelaik and Meliau, respondents from both settlements acknowledged that a cockfight was the worst procedure to resolve their conflict. They would have liked to see the conflict solved through discussion and negotiation in a more harmonious way. One respondent said, "Although we won the cockfight we felt very uneasy and sorry. For us cockfight was not the best way to resolve our conflict. After the cockfight our relationships with Meliau got worse. We don't visit so often anymore. Our leaders do not shake hands when they meet. We are very sad to see this happening, it is not easy though" (from interview excerpt). The same expression was also revealed by all respondents from Meliau that they did not appreciate a solution through cockfighting. For them too as far as possible it should be avoided.

In the case of fishery conflict, some stakeholders viewed that the resolution of the many inter-settlement conflicts could still be improved. They argued that the current procedures, although sometimes successful, in many other cases were not. Some thought that the sanctions and fines were not effective at preventing the same conflict from re-emerging. In the case of fishery conflict between Leboyan and Lanjak, the incidents of breaching areas and using forbidden fishing gears recurred regularly. Thus, many felt that sanctions did not work well as the same incidents tended to be repeated. In many other fishery conflicts, similar sentiments were also expressed by respondents.

For some stakeholders local conflict management in DSNP has been viewed as quite effective although they propose to strengthen the capacity of local institutions in dealing with these conflicts so that conflict can be addressed adequately and be anticipated. The effectiveness of conflict management approaches was attributed to the following four aspects: agreement was achieved and upheld, effective sanctions, no violence and an increased understanding among settlements on the need for clear and unambiguous boundaries. For instance, in the forestry conflict between Pengembung and Genting, the high sanction (i.e., 1 million Rupiah per tree) seemed to be effective as no similar incident took place after the conflict. In other words, agreement was respected by both parties. In many conflict management approaches and processes using *adat* (customary laws), stakeholders appreciated the non-violent nature of such procedures. They said that *adat* brings to the forefront the notion of a peaceful conflict management approach. Most importantly, many stakeholders said that they had learned a lot from the many conflicts that they had gone through. One of them said, "… now we understand why we need to have a clear working area and boundaries. Our resources are depleting and our population is growing. We need to divide our resources as clearly as possible to prevent future conflicts from emerging. This is now our first priority and we hope governments and NGOs can help us to establish these boundaries" (excerpt from interview).

[5] For instance in the forestry conflict between Sungai Pelaik and Meliau and in the fishery conflict between the *Malays*

Lessons learned and conclusions

Throughout this paper we have tried to establish a picture of how unclear resource boundaries and the presence of contradicting legal systems lead to inter-settlement conflict. Unclear boundaries of the forestry and fishing areas have led many settlements in DSNP to challenge and contest these boundaries particularly in light of economic competition among these settlements. It has also been shown that the issue of boundaries became more important as competition for the resources such as forests and fish heightened. Unclear resource boundaries as in DSNP pose several important lessons and points to ponder, particularly for those dealing with common pool resource management. Some indications are already clear with regard to why these conflicts emerged and how the local institutions (*adat*) responded. Therefore the following lessons might be reflected upon.

The need to have unambiguous boundaries in common pool resources management cannot be denied. Access to natural resources has become more concentrated and some groups or stakeholders experienced both social and spatial marginalization. Social and spatial marginalization tend to encourage conflict particularly if rules and regulations with regard to resource use and access are not clearly defined (FAO, 2000; Anau et al, 2002). If boundaries are in place they are often contested or interpreted differently (Wollenberg et al., 2002). Claims over the same area or resources often overlap. Common among national governments is the failure to demarcate indigenous territories, the tendency to draw inappropriate boundaries which undermine indigenous livelihoods, the failure to develop procedures to defend indigenous lands, and the disregard of indigenous land boundaries in favor of land uses more favored by central governments.

Common pool resource management is often defined by different sets of rules and regulations such as formal and informal rules (e.g., Alston, 2000). Very often these rules and regulations contradict each other. For instance, in the conflict between settlements that we have described above, each settlement has its own customary laws that often contradict each other (e.g., the case of fishing gear). If these contradictions make certain groups feel their access to a particular resource such as a fishing area is being contested, conflict will follow.

The extensive work done previously to map indigenous territory has helped some settlements clarify their boundaries (Erman, 1998; Denis et al, 2000). Nevertheless, not all boundaries are yet clearly delineated and different interpretation still exists, particularly during the increased illegal logging activities in recent years. An immediate task for park management is to re-evaluate the boundaries and different zones of the park. Adjustment will be needed in terms of boundaries of core, utilization and buffer zones. In doing so, park management will have to delineate indigenous territories so that these zones do not overlap with these territories. Participatory and bottom-up approaches to this are important in order to give a chance to all stakeholders to participate in the park management and also in ensuring the sustainability of the park in the future. The role of research and non governmental organizations (NGOs) will be important to assist this participatory process.

For the effectiveness of common pool resource management, it is assumed that communication among stakeholders is necessary. Our observation during the fieldwork and also information we got from respondents indicate that communication among stakeholders regarding rules and regulations did not take place regularly. Confusion of fishing rules resulted in prolonged inter-settlement conflict. We also learned from this case that communication amongst settlements with regard to different boundary conceptions and claims did not take place very often in the past. They only started to contest the conceptions and claims once they had an economic incentive (i.e., selling their timber to outsider). Only when they have come to a conflict situation did they realize the importance of boundaries. Second, the role of park management in conflict management in DSNP was essentially non-existent. The failure of the park management was indicated from its establishment. The boundaries of the park were only assigned on paper without proper consultation with local stakeholders. In the future, we argue that the park management should have more presence in the area and get in touch with all other stakeholders including different ethnic groups. Park managers should start to think of how to include various settlements and ethnic groups to conserve the park. Unless park managers can take an active role in this direction, conflict among stakeholders will continue and destruction to the remaining forests will be unstoppable.

In relation to conflict management, the optimal goal is to avoid recurrence. However, unless conflicts are minor and goodwill prevails, conflict resolution is rarely a single-step process. Conflict management is not an end itself but rather a means to achieve better resource management. Like many conflicts in common pool resource management, they are not easily resolved. They are open-ended claims that entail continuing negotiations and maneuvers. For this reason, the term conflict management refers to the various methods, mechanisms, and forums that can be employed to resolve, monitor, prevent or control conflicts (Deutsch, 1973; Wall and Callister, 1995). It is the creativity of conflicting parties to choose and apply what method they can use to best find a solution to their conflict. Some groups do better than others and in terms of conflict management enhancement of this capability is a central issue. It is important though to recognize how local institutions respond to conflict. Local institutions such as *adat* (customary laws) must be strengthened. The role of government and park management should be to help develop these institutions further in order to harness the positive potential of conflict and avoid its destructive functions. Park management might play the role in bridging communication among these settlements, for instance, by encouraging a comprehensive discussion on boundaries of working areas.

Finally, we have learned that managing common pool resources becomes more complex as it is no longer simply dealing with how to ensure the sustainability of the resources to continually serve human needs but increasingly it is also about managing people who depend on and have a "stake" in those resources. The social dimension of common pool resources will have to have a particular focus on ensuring the constructive positive relationships among stakeholders involved in their management. Managers are required to ensure and balance the goals of resource management in such a way that the best possible outcomes for social, economic, and ecological conditions can be obtained. While this task is not easy, Shields *et al* (1999) argue that resource managers are often called upon to make decisions that involve choosing from among a set of alternative actions. These decisions have the potential to be both controversial and unfair,

particularly when individuals and groups holding distinct philosophies, values, and interests are differentially affected by the implementation of any given alternative.

Perhaps in the future the managers of common pool resources such as forests and fisheries might consider a kind of co-management arrangement (Castro and Nielson, 2001). In co-management arrangements stakeholders plan and decide upon collective actions with regard to how natural resources are to be managed. The roles and responsibilities of each stakeholder are jointly identified and agreed upon based on continued negotiation and consultation processes. Adaptation to a changing environment is central in co-management. Because co-management provides opportunities for broader stakeholder participation, the concept gains more prominence especially in relation to achieving "good forest governance" objectives. Wollenberg *et al* (2004) and Yasmi and Kusumanto (2003) demonstrate how adaptive learning through bridging various stakeholder groups is facilitated in co-management projects. This kind of learning and facilitation approach to co-management has proved useful especially in increasing participation and capacities at local levels and reducing conflict.

Several routes for future research are still open regarding this topic. For instance, we have not been able to reflect on the gender perspective in this study as our sample is very much gender biased. Second, it might also be interesting to pursue how governments and park management perceive their role in terms of local conflicts because the park formally falls within their jurisdictions. And third, the issue of park sustainability amidst illegal logging activities must be carefully investigated.

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