Buffer Zone Delineation at Conservation Reserve

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Abstract

Stakeholders play an important role towards the Conservation Reserve Buffer Zone. Their perspectives with regards to the concept and delineation criteria of BZ are important and may reduce the conflict of interest between livelihood of the people and conservation objectives of the CR. This paper describes the pilot findings of in-depth interviews with the key stakeholders of two important CR in Malaysia. The findings shows that they understand the concept of BZ differently and there are disputes and agreements on delineation criteria and factors affecting the criteria.

1. Introduction

An important issue when delineating the BZ is to reach the agreement between the stakeholders to ensure the delineation area contributes significant advantages to all stakeholders. Consequently, the social-economic settings and relationships are among the ability of contracting stakeholders to sustain their obligations in BZ development. In particular, stakeholders should be considered as valuable source
and although it is always a challenge in finding a balance between them, and more general priorities, the outcome of any conciliation is more likely to have positive results if the approaches adapt to the local context (Sheil, Nasi, & Johnson, 2004). Stakeholders’ consensus is required to determine the necessary decision (e.g., managers, adjacent communities, legal enforcement agencies).

In general, broad participation becomes a norm in good practice. Nonetheless, it is effective only if they involve in the planning process and the outcome of the process favor all parties (Suškevičs, Tillemann, & Külvik). A reasonable initial point is to simply improve the integration of local stakeholders and their needs into the planning process of determining the criteria. These decisions may be due to economic considerations of the existing and future changes of the land uses. As decisions are made, stakeholders should be aware of the potential changes in desired buffer functions that occur and the potential compromise of long-term values. In most cases, a buffer width can be determined which will meet landowner needs while also providing an adequate function of BZs (Liu et al., 2010). In actuality, many BZs constitute a geographical expansion of the state authority beyond the boundaries of the CA and into the communities and economic entities (man’s land) in which the establishment of it resulted in ‘new forms of state intervention and restrictions on land use activities’ (Stræde & Treue, 2006). Sadly to say, this approach might be unwise without recognizing the ideal mutual support between local communities or surrounding stakeholders and the conservation purposes.

2. Literature review

As agreed by many parties, CR is important for biodiversity; flora and fauna that contribute to a wide range of benefits, from local to global (Klar et al., 2012). CR is also vital for carbon off-set; current mitigation to overcome the climate change phenomena (Liu, Ouyang, & Miao, 2010; Strohbach, Arnold, & Haase, 2012). One important thing is to establish criteria preferably multiple criteria, including spatial design and socio-political criteria to be used for demarcation of the boundary of the Buffer Zone (Gilmour & Nguyen, 1999; Moffett, Dyer, & Sarkar, 2006). Since the surrounding areas, so called potential BZs, belong to various stakeholders (someone who can affect, or can be effected by others’ decisions), their input to share ideas, solutions, threats and opportunities is important to reflect the collective responses to human-nature interface problems (Rastogi, Badola, Hussain, & Hickey, 2010).

2.1. Concept and criteria

BZs are supposed to serve the dual purpose of ‘extension buffering’, or an extension of core habitat areas, and ‘socio buffering’ to provide goods and services to humans (Jotikapukkana, 2010). There is no definition for ‘appropriateness’ of criteria used, but they should be explicit and quantifiable (Bibby, 1998). Previous studies have considered various factors in establishing the criteria for the delineation of BZs (Borgström, Cousins, & Lindborg, 2012; Datta, Guha, & Chattopadhyay, 2010; DeFries et al., 2010; Khoi & Murayama, 2010; Martino, 2001; Semlitsch & Jensen, 2001; Wild & Mutebi, 1997), but there is no set of criteria which covers all the said factors – ‘suitable criteria’. Among considered factors are:

- Social factors - Traditional use of land, harvesting of non-timber forest product (NTFP), agricultural activities, man-made structure etc.
- Economic factors – Agriculture, aquaculture, timber, mining etc.
- Environmental factors which include:
- Biophysical factors - Topography, soil, hydrology, road network, boundary, size, elevation, slope etc.
Ecological factors - Forest patch size, number and size, change in forest structure, habitat and conservation areas etc.

Biological factors - Criteria based on use by target species for life history functions such as feeding, mating, nesting etc.

Legal and political factors - determined by various levels of jurisdiction and agreements, from international to national to local.

Other important factors that needs to be considered while establishing the criteria is the types of BZ (Department of Wildlife and National Parks Malaysia, 2001):

2.2. Purpose of study

The purpose of this study is to gauge an understanding of the stakeholders on the BZ, and how these may be improved through the mutual understanding and consensus among them which will be translated into a set of ideal delineation criteria for BZ of CR and help to promote the conservation purposes. The objectives of the study include identifying stakeholders and their experiences related to the study area; their perception of the buffer zone concept, criteria and factors influencing the criteria and proposed buffer zone delineation for the study area. This study is a preliminary stage with the intention to gauge the level of understanding of the key important stakeholders towards the BZ concept and criteria. Further study will be carried which involve more stakeholders.

2.3. Study areas

Study Area 1 is Forest Research Institute of Malaysia (FRIM), which was declared as a National Heritage site in 2012 and now gearing towards UNESCO Heritage Site in 2015. Being one of the largest man-made forests in the world, it can serve as a model for reforestation, forest management and forest protection for the world. FRIM is located in Kepong, Kuala Lumpur and is surrounded by the Bukit Lagong Forest Reserve on one side and new developments, mainly residential and commercial areas, on the other. It stakeholders consist of Land Office, Forestry Department, Environmental Department, District Office, local community and etc. As a national heritage site, FRIM enjoys secure protection in law. However, while the area is relatively large in local terms, it is relatively narrow in width and thus is vulnerable to disturbance and nonconforming physical development in the peripheries. The need for the study arose out of increasing pressure for various forms of development in these peripheries, which had the potential to negatively affect the integrity of the park and the unique resources of the area, especially their biodiversity, water production, and scenic values. Landscape transformation by a number of land uses such as agriculture, commercial afforestation, and new settlement was found to be a significant threat to the natural beauty of much of the area.

Study Area 2 is Krau Wildlife Reserve (KWR) (Figure 1) is a typical PA in Malaysia which has been listed under the International Union for Conservation of Nature (IUCN) category. It is located partly in the district of Temerloh, Bentong and Raub in the state of Pahang, Malaysia and covers approximately 62,000 hectares. KWR is almost surrounded by forested land consisting of Permanent Reserve Forests and State Land Forests. Although KWR is almost intact, the forested areas surrounding it had considerably declined due to the changes of land use activities. Furthermore, the existence of stakeholders and local community, especially indigenous people has contributed to its complex system as well. Their activities in these areas have always had a great impact on the KWR and the surrounding areas (Che Bon, Jamalunlaili & Jasmee, 2012a).
3. Methodology and limitation of the study

The study uses qualitative approach with in-depth interviews to the stakeholders. Regardless to their level of interest and influences, identifying the stakeholders were based on their expertise, knowledge, experience and position in the organization. The representatives of an organization are likely to be the director or the person in-charge that is reliable to be interviewed. Five key important stakeholders were identified – FRIM, Selayang District Office, Forestry Department of Peninsular Malaysia, representative of residence (Taman Ehsan) and WWF Malaysia. Although there were more stakeholders of FRIM, five are selected as this study is meant for a preliminary exploratory stage in order to clarify the thoughts and opinions of the stakeholders regarding the concept and criteria of BZ delineation, and become a basis for further detail study which will be carried out later.

On the other hand, the stakeholders for KWR are Department of Wildlife and National Park, Malaysia (DWNP), Department of Town and Country Planning, Pahang (JPBD), Forestry Department, Pahang (FDPM) and State Land Department, Pahang.

The result is very preliminary, with the intention to gain some broad ideas and background information regarding the topic which will be used for further research in the near future.

4. Findings

Key stakeholders and their positions were listed in Table 1 and 2.

Table 1. Profile of stakeholders at FRIM, Malaysia

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Research Institute of Malaysia (FRIM)</td>
<td>DeputyDirector</td>
</tr>
<tr>
<td>Selayang District Office (SDO)</td>
<td>District Officer</td>
</tr>
<tr>
<td>Forestry Department, Selangor (FDPM)</td>
<td>Head of Deputy Director</td>
</tr>
<tr>
<td>Taman Ehsan residence</td>
<td>Community representative</td>
</tr>
<tr>
<td>World Wildlife Fund, Malaysia (WWFM)</td>
<td>Senior Officer</td>
</tr>
</tbody>
</table>

Table 2. Profile of stakeholders at KRAU, Malaysia

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Wildlife and National Park, Malaysia (DWNP)</td>
<td>Director</td>
</tr>
<tr>
<td>Department of Town and Country Planning, Pahang (JPBD)</td>
<td>Chief Assistant Director</td>
</tr>
<tr>
<td>Forestry Department, Pahang (FDPM)</td>
<td>Head of Deputy Director</td>
</tr>
<tr>
<td>State Land Department, Pahang</td>
<td>Assistant Director</td>
</tr>
</tbody>
</table>
Table 3. Summary of key stakeholders’ understanding of concept, criteria and factors determining the criteria for BZ delineation at FRIM

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Understanding of concept of buffer zone for conservation reserve</th>
<th>Criteria</th>
<th>Factors determining the criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Research Institute of Malaysia (FRIM)</td>
<td>An area around, inside or outside the conservation reserve allocated for protection of conservation reserve and cater for specific functions.</td>
<td>Community and conservation benefits. Based on type of land use activities, i.e., residential, industrial, forest area, highland area and stakeholders, i.e., JPS, JKR, Forestry Dept, Env. Dept.</td>
<td>Land use, Topography, Activity, Constraint, Conflict</td>
</tr>
<tr>
<td>Selayang District Office (SDO)</td>
<td>An area acts as a border to ‘rest down’ two different land use activities. It may be in the form of open spaces, railways, highways, power lines and rivers. *BZ is government land unless mutual agreement is made between two landowners</td>
<td>Community benefits Infrastructure</td>
<td>Existing land use, Future land use, Constraints, Potentials</td>
</tr>
<tr>
<td>Forestry Department of Peninsular Malaysia (FDPM)</td>
<td>An area allocated around the forest meant for protection purposes. It determines by specific functions and benefits of the forest reserve according to 11 forest classes assign by the dept. *virgin jungle forest (VGR), permanent forest estate (PFE) and water catchment area do not require BZ</td>
<td>Functions and benefits based on sustainability concept: Environment, economic and social features</td>
<td>Size of logging, Width of river stream, Size of research plot, Size of sample plot, Size of salt lake area, Wildlife coverage (small mammal, elephant and tiger)</td>
</tr>
<tr>
<td>Taman Ehsan residence</td>
<td>Open space between two areas, i.e., residential and conservation reserve</td>
<td>Community benefits and protection</td>
<td>Type of activity, Type of basic amenities</td>
</tr>
<tr>
<td>World Wildlife Fund, Malaysia (WWFM)</td>
<td>Transition land which complementing both parties’ benefits. *existing or introduced forest</td>
<td>Forest’s functions (i.e., watershed) Local community’s benefits</td>
<td>Topography, Biodiversity coverage, Ecosystem coverage, Adjacent land use activities</td>
</tr>
</tbody>
</table>

Table 4. Summary of key stakeholders’ understanding of concept, criteria and factors determining the criteria for BZ delineation at KRAU

<table>
<thead>
<tr>
<th>Respondent</th>
<th>Understanding of concept of buffer zone for conservation reserve</th>
<th>Criteria</th>
<th>Factors determining the criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Wildlife and National Park, Malaysia (DWN)</td>
<td>An area allocated around the conservation reserve for the purpose of biodiversity conservation (habitat and ecosystem).</td>
<td>Conservation and community benefits especially homogenous people living inside and surrounding the CR</td>
<td>Ecological factors, Social factors</td>
</tr>
</tbody>
</table>
Department of Town and Country Planning, Pahang (JPBD)

A kilometre wide ‘Green Buffer’ allocated around the conservation reserve. Must be not less than 70% green/planted areas and not more than 30% built-up area. Components of ‘Green Buffer’ include road, drain and trench, river and lake, car park, open space, service building and small agriculture plot.

Community benefits
Infrastructure

Existing land use
Future land use
Constraints
Potentials

Forestry Department, Pahang (FDPM)

An area allocated around the forest meant for protection purposes. It determines by specific functions and benefits of the forest reserve according to 11 forest classes assign by the dept.

* virgin jungle forest (VGR), permanent forest estate (PFE) and water catchment area do not require BZ

Functions and benefits based on sustainability concept:
Environment, economic and social features

Size of logging
Width of river stream
Size of research plot
Size of sample plot
Size of salt lake area
Wildlife coverage (small mammal, elephant and tiger)

State Land Department, Pahang

Decision on land matters are based on mutual agreement of stakeholders

5. Discussion and analysis

5.1. Criteria for delineation

Perception of the local community is crucial for the management of KWR in order to come out with the criteria to be used for the delineation.

Local communities suggested that they must be given a mutual recognition of the ownership (unique rights) of the areas and activity permitted (i.e. allowed use) and a clear demarcation of the boundary (i.e. width) which include:

- BZ will be an overlapping use by both wildlife and human. It is found that for all purposes, the surrounding Permanent Reserve Forests and State Land Forests are performing these functions. However, it has to be recognized and included into the planning document of the relevant agencies.
- The size of the BZ should be covering the surrounding Forest Reserves, agricultural areas and rivers and can be considered as natural BZ for KWR.
- For areas that are bordering FeLDA, alienated land, state land and indigenous people areas, there should be a restriction on the use of the BZ area.

6. Conclusions and recommendations

Although this paper present the output of the pilot interviews, it shows that there are some dispute, disagreement as well as agreement among the stakeholders in term of their perspectives on buffer zone delineation. Two different setting (location) of CR present different perspectives and it shows that the requirement of criteria for delineation is may appropriately be based on the local context. As mentioned earlier, this is the earlier attempt to delineate a buffer zone on private and communal land, and natural and built environment around the peripheries of a major conservation area. The proposed buffer zone was designed to benefit both, the park itself and the surrounding landowners. This research may be of more
significant should there be more important stakeholders is included especially the different group of the local community. They play important role because the factors which influence their perceptions and attitudes, as well as the nature and the extent of the impact are likely to be different in each community (Ahmad, Abdullah, & Jaafar, 2013).

Acknowledgements

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