

Abstract No: A-096

LOCAL PEOPLES' APPRECIATION ON AND CONTRIBUTION TO CONSERVATION OF PEATLAND SWAMP FORESTS: EXPERIENCE FROM PENINSULAR MALAYSIA

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SUMMARY

Over recent years, industrial plantation development on peatland and / or peat swamp forests (PSF) areas has created intense debate due to its potentially adverse social and environmental effects. In this paper we examined local peoples' appreciation on the values of PSF and how they can contribute to its conservation and protection. The study was carried out by interviewing 100 respondents and holding two focus group discussions in some degraded PSF areas in Perak and North Selangor Peat Swamp Forest. The study adopted participatory rural appraisal and contingent valuation methods. The respondents appreciated PSF for direct values including timber (6% respondents), vegetables (20%) source of fish (28%) and water for agriculture (32%). More than 80% respondents reported environmental values of PSF that includes flood prevention, biodiversity conservation, fresh air, soil fertility, perennial water source, and reduction of storm damages. They also reported several health and cultural benefits including sources of medicinal plants (62%), fresh food (50%), pure environment (92%), and tourism (84%). Even though they mentioned about demerits of PSF conversion such as deforestation (90%), biodiversity loss (90%), flooding (88%), and water scarcity (86%), they also claimed that PSF conversion provides them land for agriculture (50%), housing (24%) and for oil palm (60%). The respondents felt that the government agencies, large and small-scale oil palm companies are equally responsible for PSF degradation. They propose government should enact ban (80%) on PSF conversion and build community-forestry department-NGO partnership (90%) for PSF management. They sincerely want to contribute to PSF conservation through protection (75%), tree planting (82%), donation in cash (60%) and supplying seedlings, and joining in awareness creation programme (85%). The intrinsic values and peoples' enthusiasm for PSF conservation suggest for a community-based approach for sustainable PSF management. A pioneer project on community-based PSF management being implemented in North Selangor Peat Swamp Forest is discussed in this paper.

Keywords: *direct benefits, indirect values, peoples' contribution, community participation*

INTRODUCTION

Peatland swamp forests (PSFs) serve many functions to both humanity and the balance of the world's ecosystems. A pristine peat swamp forest may be home to many of the rarest endemic species due to the unique environmental conditions it provides (Posa *et al.*, 2011). These forests serve essential ecological functions including flood mitigation, water storage, carbon sequestration and storage, river base flow control and sediment removal (Ritzema *et al.*, 2006; UNDP 2006; Miettinen & Liew 2010; Wetlands International 2010; Posa *et al.*, 2011; Miettinen *et al.*, 2012; Schrier-Uijl *et al.*, 2013). However, these forests are being destroyed drastically through unsustainable logging, conversion to other land uses and indiscriminate fires. The conversion of PSFs causes deforestation, subsidence, long-term inundation, the loss of environmental services, carbon loss and increase greenhouse gas emission (Schrier-Uijl *et al.* 2013). There is growing public concern regarding the harmful environmental and social impacts of large scale conversion of PSFs into industrial plantations, mainly of oil palm (Nagiah and Azmi, 2012). There are serious concerns but yet to be studied about the impacts of oil palm expansion on forest dependent communities and the social and ecological consequences of large scale conversion of peatlands (Schrier-Uijl *et al.*, 2013).

Research on PSFs mostly focuses on carbon emission (Miettinen & Liew, 2010; Posa *et al.*, 2011; Page *et al.*, 2011; Miettinen *et al.*, 2012; Schrier-Uijl *et al.* 2013), and biodiversity (Wetlands International, 2010; Posa *et al.*, 2011; Miettinen *et al.*, 2012). Even though forests provide many benefits to local community but values of PSFs

to local people is still poorly understood. In the context of PSFs these values may explain or emphasize social, cultural and environmental values of non-human natural objects (Palmer, 2003). The values of individuals highly affect how they perceive about the existing PSFs and as a result affect the actions taken by individuals in a society towards its existence. The aim of this study was to find out about local peoples' appreciation on the values of PSFs in their life, their understanding on causes of PSFs degradation, and their willingness to contribute to the conservation and protection of peatland swamp forests. We could not find any research contribution particularly on these aspects of PSFs.

METHODS

The study was conducted in several villages inhabiting surrounding the Pondok Tanjung forest reserve (PTFR), Perak and Raja Musa forest reserve (RMFR), Kuala Selangor of Peninsular Malaysia. The PTFR covers an area of about 6718 ha and is probably the largest remaining swamp forest in northern peninsular Malaysia surrounded by oil palm and rubber plantations (Bird Life International, 2016). It is a permanent forest reserve gazetted in 1913 and is classified as a production forest where logging was performed from 1939 to 1989 (Ibid.). The RMFR is a peat swamp forest (about 35,656 ha) subjected to intensive logging since 1950s before its gazettement in 1990 as a forest reserve (GEC, 2013). Intensive logging followed by draining of peat water, encroachment of logged-over land and unsustainable agricultural practices had caused serious forest degradation. In 2008, the Selangor State Forestry Department had recovered about 1000 ha of degraded PSF and took a rehabilitation programme in partnership with Global Environment Centre, a non-government organization and local community people (GEC, 2013). Since then they have been replanting the degraded RMFR sites.

Data for this study was collected through a participatory rural appraisal method by administering a semi-structured questionnaire and holding two group discussions with villagers. We also conducted key-informants interviews with GEC staff members and carried out another group discussion with the members of Friends of North Selangor Peat Swamp Forest (FNSPSF). We interviewed 100 randomly selected households, 50 in each site, living in around the peat swamp forests. We collected data on their basic socio-economy, direct benefits or products obtain from PSF, environmental, health, and cultural benefits, merits and demerits of PSF conversion, actors responsible for conversion and their opinion on conservation or prevention of PSF conversion. By following contingent valuation method (Mitchell and Carson, 1989) we explored local peoples' willingness to contribution to the conservation of PSF. The group discussions also considered the above issues in addition to their willingness to participate in REDD+ programme if government would like to invite them. In order to assess peoples' participation and effectiveness of peatland rehabilitation project on restoration of degraded PSF in RMFR we hold a group discussion with six members of FNSPSF and talked to GEC staff members. A check-list was used to facilitate the discussion. We also asked a few questions to villagers on project activities during household survey. The collected data are compiled and frequency and percentages are calculated. The findings are presented mostly qualitatively with some quantitative inferences.

RESULTS

In this section we first give a brief description of respondents' profile followed by values of PSF to local people, their willingness to contribute towards PSF conservation and peoples' participation in the restoration of peat forests in RMFR.

Respondents' profile

Both male (69%) and female (31%) respondents took part in interviews and their mean age was 37.5 years indicating that they were matured enough to understand the survey questions and responded accordingly. Most of them (63%) obtained secondary education and majority (37%) were farmers. About 67% respondents lived within 1-2 km from the peat swamp forests. The respondents' mean household income level range was RM1500 to RM2500 mainly from agriculture, business and service.

Values of PSF to local people

Like other types of forests PSF also have great importance for local people. Even though the villagers are not heavily dependent on PSF for their living, they obtain several products from these forest resources. They valued PSF for both direct and indirect benefits. The direct benefits they reported included timber (6% respondents), medicinal plants (6%), vegetables (20%), source of fish (28%) and water for agriculture (32%). Some respondents said that they got land for agriculture (4%) and oil palm plantations (25%). In both sites the respondents commented that they get fresh water fishes from canals and use canal water for paddy field irrigation round the year. Based on their responses we estimated that they catch about 46 kg of various types of fishes every month mostly for their own consumption. In group discussion the participants at RMFR reported that PSF is an important source of income for some of the villagers who collect *Palas* leave (*Daun Palas*) from the forests to make

handicraft and wrapping of transitional food (i.e kutupat and nasi lemak). They also use the shoots of *Tenggek Burung* (*Euodia redlevi*) as a salad in their meals.

Apart from direct benefits, the respondents profoundly reported the environmental values of PSF. More than 80% respondents reported environmental values of PSF that includes flood prevention, biodiversity conservation, fresh air, soil fertility, perennial water source, and reduction of storm damages. They said the PSF is not only a source of water but also act as water reservoir to protect villages from flood. The PSF provide suitable habitat for wildlife. They also reported several health and cultural benefits including sources of medicinal plants (62%), fresh food (50%), pure environment (92%), place for relaxation (76%) and tourism in S. Selangor (84%). The tourism activities they mentioned include river cruising, fishing, bird and wildlife watching. In K. Selangor villagers with support from GEC have developed homestay agro-tourism and it serves as a substantial income source. They mentioned that due to existence of PSF they could establish agro-tourism destination in their locality. The respondents also reported that students from various institutions visit PSF for education and research purposes and they feel proud of being a part of these novel activities.

Conversion of PSF

Keeping in mind of PSF degradation for other uses we asked respondents about merits and demerits of conversion and who are responsible for that. Even though they mentioned about demerits of PSF conversion such as deforestation (90%), biodiversity loss (90%), flooding (88%), destroy wildlife habitat (85%), reduction of income sources (58%), water scarcity (86%) and non-availability non-timber forest products (72%), they also claimed that PSF conversion provides them land for agriculture (50%), housing (24%) and for oil palm (60%). The respondents felt that the government agencies, large and small-scale oil palm companies are equally responsible for PSF degradation. They also mentioned that villagers themselves clear PSF for growing rice, vegetable, fruits, and oil palm as well as for house building.

PSF conservation and willingness to contribution

The respondents propose government should enact ban (80%) on PSF conversion for oil palm plantation, rice cultivation, housing development and horticulture practices. They emphasized on building community based forestry management-NGO partnership (90%) for PSF management. Further, respondents stress on creating awareness among community people on the importance of and conservation of PSF through education. They sincerely want to contribute to PSF conservation through participation in community-based management (74%), patrolling and fire protection (75%), tree planting (82%), donation in cash (60%) and supplying seedlings, and joining in awareness creation programme (85%). When explained the concept of REDD+ and its importance to forests conservation and local economy, the respondents showed positive attitude to join in any REDD+ programme if initiated by the government. They commented that such a programme would be a worthy way to build community engagement and partnership in protecting the PSF. The intrinsic values and peoples' enthusiasm for PSF conservation suggest for a community-based approach for sustainable PSF management.

PSF rehabilitation project

The PSF rehabilitation project is a pioneer project on community-based PSF management being implemented in North Selangor Peat Swamp Forest. Since 2008 the GEC in collaboration with Selangor state forestry department and local community has been implementing this project. The main activities include monthly tree planting, patrolling, fire monitoring and prevention, awareness creation among villagers and community development through small scale nursery (small medium scale business) and agro-ecotourism promotion. The GEC in collaboration with Selangor State Forestry Department (SSFD) initiated an innovative way of reforestation through inviting corporate agencies, academic institutions, NGOs and other concerned stakeholders to participate in monthly tree planting programme. It circulates invitation through its social media forum and interested agencies confirm their participation by registration. Participation is first-come first-serve basis and 100 participants can register in an event for planting 400-600 seedlings in one hectare of degraded PSF land. The planting cost including seedlings and land preparation is usually arranged through sponsors such as international funders and local corporate agencies.

The GEC staff members reported that till 2014 it established about 310 ha of degraded area was replanted through monthly planting programme. They also said that in 2011 when the planted seedlings in compartment 99 attained at 5-6 m in height all of them (250 ha) were burnt. The GEC suspects small scale palm oil farmers in the buffer zone areas for burning of 250 ha rehabilitated area. The farmers set fire in palm oil areas to prepare the land for planting and the fire might spread out in the compartment 99. The prolonged dry summer season was also expediting the spread of fire. In compartment 73, the Selangor State Forestry Department and GEC established —Centre of Excellence for PSF” where they only manage the watershed to maintain the water level in peatland by blocking the canals to raise water level and facilitating natural regeneration along with reforestation. The areas seem regenerating with diversified tree species and the optimum water level surrounding the areas. In a few planting sites established in 2012 through 2014 we found a survival rate of 85% with a spacing of 3m x 5m and mean height of

seedlings 1.6m. The planted species are mahang (*Macaranga pruinosa*) and tenggek burung (*Euodia redlevi*) and these are common pioneer species usually planted in degraded peatland area.

In 2011 the GEC in collaboration with Selangor State Forestry Department established a community based organization called "Friends of North Selangor Peat Swamp Forests" with 40 members, 10 from each of the four villages and currently has 90 members. The organisation was registered in 2012 so that it can work without any legal barriers. The main purpose of the organisation is to create awareness among villagers about the importance of peatland swamp forests. It collaborates with the SSFD and the GEC, works on reforestation, fire control and daily patrolling. Due to awareness creation and motivation there was no incidence of fire in year 2015. The organisation also works on community development through homestay agro-tourism. With the rehabilitation project four farmers were trained on tree nursery and with that knowledge they established nurseries at their homesteads. They collect wildings from palm oil plantations and raised them in polybags. All raised saplings used for monthly planting programs and they reported to have an annual income of RM 30,000.00 by selling saplings. The FNSPSF in collaboration with the GEC established Junior Peatland Forest Ranger Programme at school level to create awareness among school students about the importance of PSF and thereby protection of these forests. Initiated in 2014, this programme has so far been extended in 12 primary schools in North Selangor. It introduces environmental knowledge in school programme, involves students in various outreach events (e.g. planting event) and creates awareness of the responsibility and the role of local youth for environmental protection and conservation for the future generation.

DISCUSSION AND CONCLUSION

The findings of this study show that the interviewed villagers appreciate that they have been benefited directly (resources support) and indirectly (services) by the peatland swamp forest. Even though the direct benefits including timber, medicinal plants, fish are not so great but the indirect benefits that include source of water, flash flood mitigation, biodiversity, environmental protection are of great importance to the local people. The villagers are mostly dependent on PSF's water for their agricultural practices and domestic usages. They are well aware about the possible negative impact of PSF conversion on their life and hence they have been collaborating with GEC and forestry department for the conservation and rehabilitation of degraded PSF. Researchers suggested that understanding peoples' perceptions of the services provided by natural systems can provide insights into the interplay of the innate linkages between humans and their environment which in turn can contribute towards identifying ways to reduce future impacts on society from environmental change (Abram *et al.*, 2014). In order to sustain the inter-linkages of society and environment participation of local community in environmental management is essential. Community participation in natural resource management is nowadays an essential element of natural resource administration. In case of forest management community participation has been proved as a drive tools for sustainable management. The involvement of local community in the rehabilitation of degraded RMRF is a successful pioneer initiative in Malaysia. The local community without any significant economic incentives has been profoundly engaged with forest conservation and protection. The commitment of the GEC and forestry department towards successful collaboration, creation of awareness about the importance of PSF, motivation and formation of social capital between local community and external agencies facilitated the effective community participation in the programme. The formation of the FNSPSF was a milestone for capacity building of the community people for creating environmental awareness among younger generation in the society. Apart from organizing important environmental events, this organization initiated several income generating activities including homestead nursery, agro-ecotourism and handicraft industry in the locality.

In conclusion, the societal and environmental values of PSF warrant that these forests should be conserved for the welfare of society and for other natural beings and that the participation of local community in the conservation and rehabilitation is very crucial. This kind of collaboration among community people, non-government organizations and state agencies can be promoted in the management country's natural resources where relationships between community and natural environment are interconnected.

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