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MANAGING PEATLAND- REGULATING CONTROLLED OPEN BURNING IN SARAWAK

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SUMMARY

Traditionally, peatlands in Sarawak are only utilised and harvested for timber and non-timber forest products. However, with the advent of scientific, technological innovations and good management practices it is possible to develop these problematic peatlands into major economic crops such as oil palm, sago and other cash crops. The native land owners are also riding on the bandwagon in developing their customary peatlands for cash crops such as oil palm to enhance their socio-economic livelihoods. The opening up of rural peatlands provides impetus for infrastructure, public utilities and telecommunications development to many inaccessible coastal settlements and other rural areas. Recognising the significant roles of peatlands for biodiversity conservation, storage of organic carbon and balancing the emission of GHG, the State of Sarawak has undertaken proactive and integrated approach in peatland ecosystems to prevent their irreversible degradation. Environmental elements are incorporated in the State's development policies, enhanced institutional capacity to enforce environmental regulations and collaboration in scientific peat research to help ensure that peat resources are sustainably managed. The State has also adopted the Canadian Fire Danger Rating System to manage biomass disposal in plantation development, including peatland development, through a controlled open burning permit system. This system has been effective in controlling haze pollution from local sources, as the open burning permit will only be issued during favourable weather conditions.

Keywords: *good management practices, irreversible peat degradation, controlled open burning, Fire Danger Rating System, socioeconomic livelihoods.*

INTRODUCTION

The State of Sarawak has earmarked oil palm (*Elaeis guineensis*) as one of the main agriculture crops for socio-economic transformation of its rural population and to achieve the State's vision of a developed state and a high income economy by 2030. The State is targeting to develop 2.0 million hectares of oil palm plantation by 2020 and to date more than 1.3 million hectares have been planted, including about 400,000 hectares of peatlands. The development of peatlands as the new growth frontier provides the impetus for much need infrastructure and amenity development such as roads, telecommunications and water supply for the rural communities. Many native customary land (NCL) owners are taking the opportunity of market access in developing their once idle and marginal NCR lands, including peatlands, with oil palm to enhance their socio-economic status, children's education and participating in nation building.

BACKGROUND

Traditionally, peatlands have been the source of timber and non-timber forest products, and food, providing sustainable livelihoods for rural communities. Peat swamp forests have high biodiversity of plants and animals. They have hosted numerous mammals, including the famous proboscis monkey (*Nasalis larvatus*) and the elusive red-banded langur (*Presbytis melalophos cruciger*). They have also been home to endangered and rare reptiles, for example, the Malayan false gharial (*Tomistoma schlegelii*), the Asia soft-shell turtle (*Amyda cartilaginea*) and other diverse aquatic animals. To date, the State has set aside about 105,563 ha of peat swamp forests (PSF) as Totally Protected Areas (TPA) under the National Parks and Nature Reserves Ordinance (1997) and other peatlands having high biodiversity conservation values will also be gazetted as TPA in the near future. The remaining peatlands, especially State land and NCR, have been identified for economic development to enhance the living standard of the present and future generations.

There are numerous reports on potential environmental issues associated with development of peatlands, such as peat subsidence, flooding, degradation of terrestrial and aquatic ecosystems, and carbon emission from uncontrolled peat fires (Sawal, 2003; Mamit and Sawal, 2003). In Sarawak, development of peatlands is regulated

under the Natural Resources and Environment Ordinance, 1993 (Chapter 84, Law of Sarawak 1958), whereas development of industries such as oil palm mills are regulated under the Federal Environmental Quality Acts (DOE, 1974). Though peatlands were once considered marginal and problematic soils good management practices have not only increased crop productivity but also reduced potential environmental problem associated with peat development. For example, maintaining high water table and using compaction help to improve aeration in the crop root zone, increasing soil bulk density, soil surface load-bearing capacity and water filled pore space. The availability of modern technology and equipment, better understanding of peat dynamics, nutrition and proper water management has enabled developers and land owners to develop problematic deep peat for oil palm, sago and other agricultural crops (Mutert, E. *et al.*, 1999). The recently established Tropical Peat Research Laboratory (TPRL) Unit of the Sarawak Government is a testimony of the State's endeavour to protect and manage its peat resources through holistic research on peat dynamics and potential for lasting benefits to Sarawak as well as global communities.

TRANSBOUNDARY HAZE POLLUTION

In Sarawak, smoke haze pollution from peat fires is very much under control due to strict enforcement and effective fire prevention strategies. Nevertheless, from the month of June to September every year, the dry south westerly brings over these hazardous smoke haze, the State is experiencing transboundary smoke haze pollution from Kalimantan, Indonesia which severely affects the health and socio-economic activities of the State. As seen in Figure 1, transboundary haze as represented by thousands of hotspots (Figure 1) in Kalimantan, Sumatera and Sulawesi are causing severe air pollution in Southeast Asia region (ASMC, 2015). During this period, the correspondingly air quality throughout the State are also showing downward trends from good to unhealthy levels. Smoke haze which are made up of fine particles, with diameter of less than 10 micron, resides longer in the atmosphere and travel thousands of kilometers. As reportedly in both printed and electronic media, unregulated development and uncontrolled peat burning for oil palm plantation are main sources of smoke haze pollution.

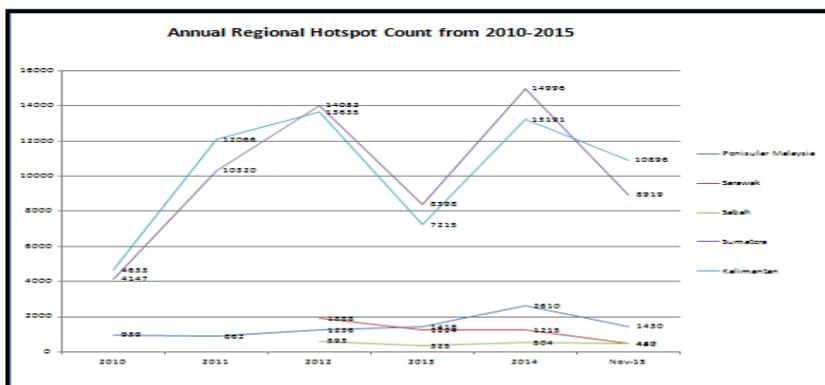


Figure 1: Showing hotspots detected over Southeast Asia regions in 2015

This perennial transboundary haze pollution has immeasurable impact on the livelihood and socio-economic activities of the people of Sarawak. Hundreds of schools were forced to close affecting hundred thousand of students when air quality reaches unhealthy level (API above 100) thereby disrupting classes and outdoor activities. Poor visibility are causing disruption to air flights affecting mobility and reduction in tourist arrival, cancellation of sports and outdoor activities and spiked in respiratory related illness. As an example, when Kuching International Airports (KIA) was closed on 20th October 2015, thousands of passengers were stranded as commercial planes were not able to take off or land at KIA due to low visibility. Indirectly, haze pollution also affects economic and business sector, additional costs for health care, especially for asthma related ailments and crop productivity (NREB, 2015).

FIRE DANGER RATING SYSTEM

During the haze episode in 1997-98, when the State of Emergency was declared over Sarawak due to deteriorating air quality where API readings breached 400 (hazardous level). Following this incident, the State of Sarawak gazetted the Natural Resources and Environment (Fire Danger Rating System) Rules 2004 with the objective of regulating open burning activities in Sarawak and reducing haze pollution from local sources. Under this Rules, land owners or developers are required to apply for Open Burning Permits (OBP) if they wish to manage and dispose of their biomass through open burning (Figure 2). This OBP requirement, however, does not include rural farmers who are free to continue practicing their traditional subsistence livelihood in their respective NCR

lands. This has proven to be effective in managing biomass through controlled open burning in both mineral and peat soils in Sarawak (NREB, 2004).

The Natural Resources and Environment Board (NREB), Sarawak will process and issue the necessary permits if they meet the set criteria based on FDRS, adopted from the Canadian Fire Danger rating System, such as favourable weather condition, proper staking of biomass for burning with adequate fire break, trained fire-fighting team, and adequate firefighting equipment and machines to suppress any potential fire outbreak. No OBP will be issued and the approved OBP will be revoked if the weather condition becomes unfavourable, such as:

- *Fire Weather Index (FWI) readings exceed value 7 (high fire hazard);*
- *API readings exceed 100 (unhealthy level); and*
- *Upward trends of hotspots detected locally and across the border.*

To ensure that permit holders comply with the terms and approval conditions, as in Figure 3, the NREB will monitor and carry out site supervision during burning operations. The NREB's Centre for Remote Environmental Monitoring (CREM) will carry out desktop verification on all hotspots over Sarawak (as detected by NOAA18 satellite), to determine their legality, i.e., whether the hotspot located within or outside the EIA approved development areas or the source of hotspots are from OBPs issued by the NREB. The NREB have also established a Geographical Environmental System or GeoEnviron which stores digitized information of all EIA approved projects, including maps and progress of development (NREB, 2014). Thereafter, ground verification will be carried out to determine the exact location of burned areas (Figure 4) and as provided in the law (NREB, 1997), any cases of illegal open burning or violation to terms and approval conditions of the OBP, an Investigation Paper (IP) will be produced for further action. The NREB will seek the support and cooperation from the Royal Malaysian Police and the State's Attorney General Chambers to determine the necessary following up actions, either to:

- Issue directives and reminder letters to require the conduct of remedial and rehabilitation works;
- Issue Offer to Compound for non-compliance to approval conditions; or
- Proceed with Court prosecution for repeated offences or serious breaches of approval conditions.

While strict enforcement acts as a deterrent to would be offenders, the NREB also implement soft enforcement initiatives through environmental outreach programmes which are aimed to seek cooperation and support of all stakeholders to ensure no open burning is carried out during drought period. Through the NREB's Haze Watch Report, public and relevant stakeholders will be updated on the latest environmental quality such as regional hotspots count, Air Pollutant Index (API) and Fire Weather Index (FWI) for various regions in Sarawak. The State also established Hotline access for public to report any cases of environmental pollution or to report directly to enforcement agencies on any information pertaining to environmental pollution for follow up actions.

THE ACHIEVEMENT

The adoption of FDRS in Sarawak has proven to be successful in abating illegal open burning and effectively reducing smoke haze pollution from local sources. As seen in Figure 5, the numbers of hotspots detected over Sarawak during the past few years are strictly under control, as evident from fewer numbers of hotspots than those in other Southeast Asia regions such as Peninsular Malaysia, Kalimantan and Sumatera. In 2015, only 439 hotspots were detected in Sarawak including 110 hotspots from controlled open burning activities regulated by the NREB. Six (6) hotspots were identified to be illegal open burning and the rest were from subsistence farming activities by local NCR land owners. In comparison, there were more than 1,430 hotspots in Peninsular Malaysia, 10,890 and 8,919 hotspots detected over Kalimantan and Sumatera, respectively.

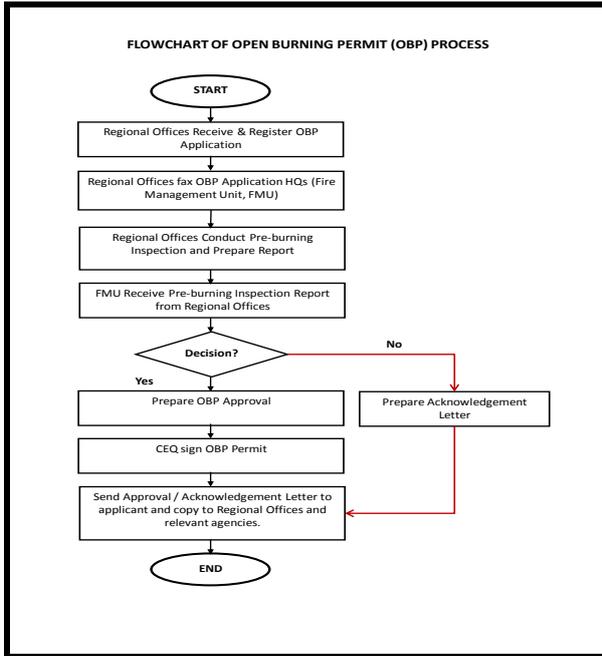


Figure 2: Flowchart for processing of Open Burning

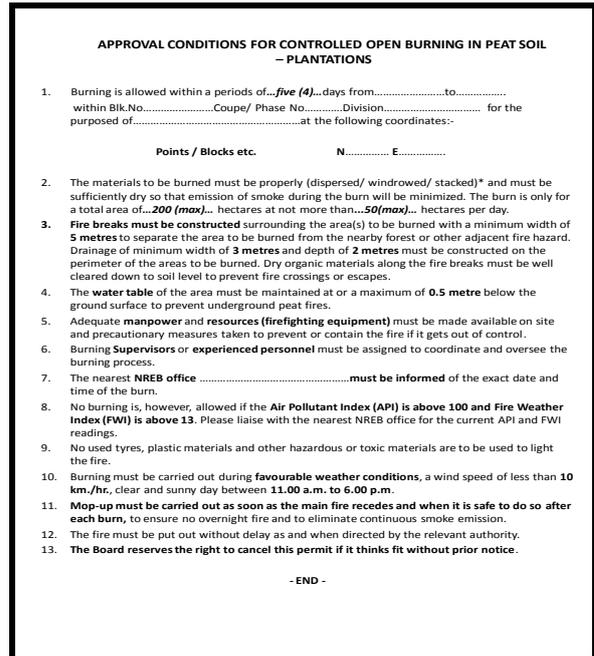


Figure 3: Approval conditions for OBP in peat soil Permit development

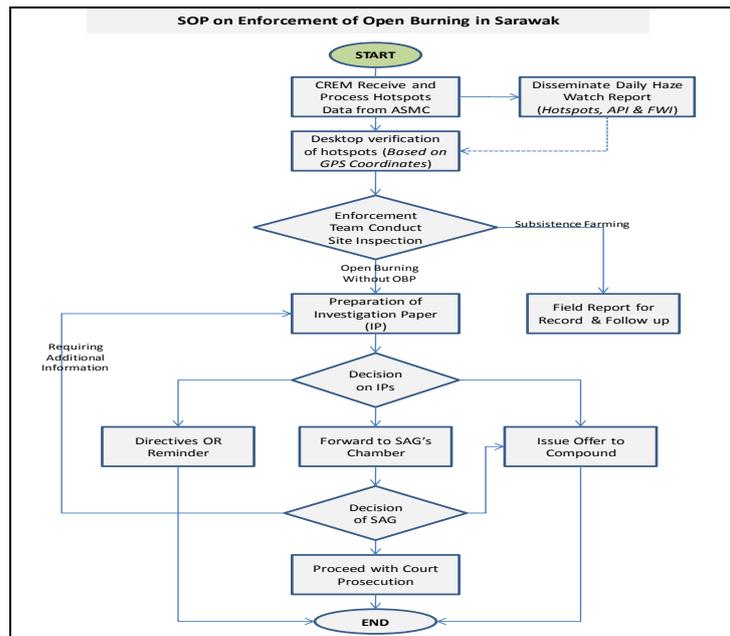


Figure 4: Showing flowchart of enforcement activities by NREB

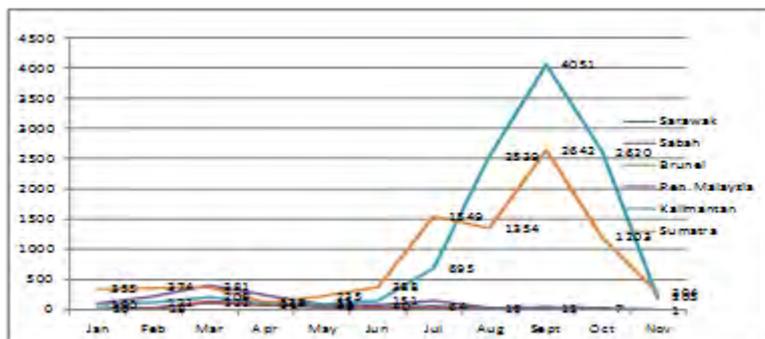


Figure 5: Showing hotspots detected over Southeast Asia regions in 2015

CONCLUSION

Collective and integrated efforts of all stakeholders are equally responsible in ensuring minimal smoke haze from local sources, which include:

- Proactive monitoring and enforcement (both ground and aerial surveillance)
- Prompt fire suppression and water bombing by Rescue and Fire Fighting Department;
- Cloud seeding by the Meteorological Department;
- Construction of tube wells, check dams and watch towers in fire prone areas; and
- Dissemination of information on danger of open burning and the impact haze pollution to human health in printed and electronic media.

Sustainable development can only be achieved if equal attention is given to integrate social-cultural, ecological and environmental integrity in the planning and implementation of economic development. The State of Sarawak is confident that the use of modern technology and innovation, better understanding of peat dynamics and good management practices are able to transform marginal and problematic deep peat soils for development of important commercial crops. The application of FDRS has enable the State of Sarawak to effectively regulate open burning practices and the strict enforcement helps to reduce incidence of illegal open burning.

In the long term, the State Government is committed to adopt integrated management and enforcement of open burning in Sarawak through various initiatives which include; the enforcement of zero open burning by 2020, regulating open burning for commercial activities in NCR areas, adoption of polluter pay principle, provide incentives for companies who adopt zero burning, construction of more Air Quality Monitoring Stations in many strategic and urban areas, and the support of individuals and local communities as enforcement agent to help curb incidence of illegal open burning (HPT, 2015).

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