

Monitoring of Biomass Burning Aerosols Characteristics in Southeast Asia from Space and/or Ground

Masayoshi Yasumoto

Faculty of Applied Sociology, Kindai University,
3-4-1 Kowakae, Higashi-Osaka, Osaka 577-8502, Japan
yasu@socio.kindai.ac.jp

Extended Abstract

In recent years, deforestation in Southeast Asia has become a major issue. The main cause of deforestation is the development of plantations for producing raw materials for paper and palm oil products consumed daily. Palm oil is a vegetable oil obtained from the fruit of oil palm and is the most consumed vegetable oil in the world. Oil palms are endemic to the tropical regions, and in particular, Indonesia is a remarkable expansion of plantations, and it is currently the world's largest oil palm producer. The forest area of Sumatra island has been halved in the last 30 years, and Borneo island has lost a third and many wildlife have been designated as endangered species.

When making a tropical rain forest into farmland, not only cutting down trees but also field burning is performed. It is known that the biomass burning plumes generated by large forest and agriculture fires in autumn in Indonesia [1, 2], causes severe public health problems [3]. Atmospheric aerosols play an important and complex role in the Earth's radiation budget, having both a direct and indirect effect, so it is necessary to study seasonal and regional variations [4]. Furthermore, to burn off the peat swamp forest, in a few days later, fires will also occur in other places. Since a large amount of carbon is emitted into the atmosphere by the fire, it is a big problem from the viewpoint of global warming.

The purpose of this research is to clarify the relationship between fire occurrence frequency, geographical distribution, time variation, and substances generated, using satellite and ground based data. We first investigated the number of hotspots on Sumatra and Borneo calculated from satellite data. It was found that the year in which the number of forest occurrences was large was 2012 in Sumatra and 2006 in Borneo. The monthly mean values in the Borneo region of the optical thickness of the aerosol calculated from satellite data are very high at 1.93 in September 2015 and 1.65 in October. The smoke from the extensive fire that occurred in the dry season caused health damage in Indonesia and abroad. On the day of presentation, we will report the state of air pollution in Southeast Asia due to forest fires.

References

- [1] N. Feng and A. A. Christopher, "Satellite and surface-based remote sensing of Southeast Asian aerosols and their radiative effects," *Atmos. Res.*, vol. 122, pp. 544–554, 2013.
- [2] J. S. Reid, E. J. Hyer, R. S. Johnson, B. N. Holben, R. J. Yokelson, J. Zhang, J. R. Campbell, S. A. Christopher, L. D. Girolamo, L. Giglio, R. E. Holz, C. Kearney, J. Miettinen, E. A. Reid, F.J.Turk, J. Wang, P. Xian, G. Zhao, R. Balasubramanian, B. N. Chew, S. Janjai, N. Lagrosas, P. Lestari, N-H.Linr, M. Mahmud, A. X. Nguyen, B. Norris, N. T. K. Oanh, M. Oo, S. V. Salinas, E. J. Welton, S. C. Liew, "Observing and understanding the Southeast Asian aerosol system by remote sensing: an initial review and analysis for the Seven Southeast Asian Studies (7SEAS) program," *Atmos. Res.*, vol. 122, pp. 403–468, 2013.
- [3] J. Wang, Q. Liu, N. Ying, X. Wang and J. Ma, "Air quality evaluation on an urban scale based on MODIS satellite images," *Atmos. Res.*, vol. 132, 22–34, 2013.
- [4] M. Nakata, S. Mukai and M. Yasumoto, "Seasonal and Regional Characteristics of Aerosol Pollution in East and Southeast Asia," *Front. Environ. Sci.* vol. 6, no. 29, 2018.