

On reliable pattern of historical land-use and land-cover change transition in Southeast Asia

*Masayuki Kondo¹

1. Center for Environmental Remote Sensing, Chiba University

Unmanaged deforestation and agricultural land development are considered as one of the factors that accelerate the risk of global warming. Due to persistently active land-use activities for years, Southeast Asia is the region known for the highest rate of forest loss among the global tropics. Recent biogeochemical models have incorporated processes of land-use changes (LUC) so as to be able to simulate effects of the use and development of agricultural and forestry resources on the terrestrial carbon balance. However, complexity of land-use processes hampers to establish the accuracy of model estimates, especially for Southeast Asia.

Southeast Asian LUC emissions by biogeochemical models have drastically changed between before and after the update of land-use and land-cover changes forcing for models (i.e., Land-Use Harmonization: LUH). Before the update, (1) LUC emissions increased from the 1980s to the 1990s, then decreased in the 2000s. After the update, (2) LUC emissions were kept at a low level for the 1980s-1990s, then started increasing in the 2000s and continued to increase towards the recent years. These changes question whether efforts of land-use management strategies in the past decades has been effective, thus deliver different messages to policy makers. Based on results of multiple estimates of LUC emissions including biogeochemical models (the TRENDY series, ver. 2 to ver. 7), statistical approaches (inventories and country statistics), and remote-sensing, this study evaluates how reliable pattern of historical land-use and land-cover change transition in Southeast Asia should be.

Keywords: Land-use change, Southeast Asia, Biogeochemical model