Moso Bamboo (*Phyllostachys pubescens*) Forest as a Significant Carbon Sink: Case Study Based on Four Year Measurement in Central Taiwan

Meng Ying Lin (1,2), I Fang Hsieh (3), Po Hsuan Lin (1), Chih Hsin Cheng (1), and Tomonori Kume (1)

(1) National Taiwan University, School of Forestry and Resource Conservation, Taipei City, Taiwan, (2) Taiwan Forest Research Institute, Taipei City, Taiwan, (3) Boston University, Department of Biology, Boston, United State

Recently, the aggressive expansion of Moso bamboo (*Phyllostachys pubescens*) forest to surrounding ecosystems has been noticed in eastern Asian countries such as Taiwan. The carbon balance including aboveground and belowground carbon stock might be influenced greatly by the vegetation replacements. Moso bamboo has an "off-year" and "on-year" growth phenomenon that would cause significant difference of net primary productivity (NPP) and net ecosystem productivity (NEP) between the two years. So far, few studies have investigated carbon cycling with the consideration of the impact of biennial cycle in Moso bamboo forests. Therefore, the aims of this study were to understand the characteristic of carbon cycle in a pure Moso bamboo plantation, situated in a montane cloud forest zone of central Taiwan. To these ends, this study 1) examined the aboveground and belowground biomass, 2) estimated the NPP and NEP in the Moso bamboo forest with the long-term data (2012-2015) and 3) compared the results of NPP and NEP in this study with other forests in Taiwan and in the worldwide scale. The NPP and NEP of Moso bamboo forest were 8.95 and 4.17 was Mg C ha^{-1} yr^{-1}, respectively. Comparison of NPP in this study with other forest types showed that the NPP in this study was comparable with that of tropical forests with high annual temperature. The NEP in this study was similar to that of temperate humid forests showing world-largest class NEP. The results revealed that Moso bamboo forest as a potential role of carbon sink in forests ecosystem.