



## **The Change in the area of various land covers on the Tibetan Plateau during 1957-2015**

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With average elevation of 4000 m and area of  $2.5 \times 10^6$  km<sup>2</sup>, Tibetan Plateau hosts various fragile ecosystems such as perennial alpine meadow, perennial alpine steppe, temperate evergreen needleleaf trees, temperate deciduous trees, temperate shrub grassland, and barely vegetated desert. Perennial alpine meadow and steppe are the two dominant vegetation types on the heartland of the plateau. MODIS Leaf Area Index (LAI) ranges from 0 to 2 in most part of the plateau. With climate change, these ecosystems are expected to undergo alteration. This study uses a dynamic vegetation model – Lund-Potsdam-Jena (LPJ) to investigate the change of the barely vegetated area and other vegetation types caused by climate change during 1957-2015 on the Tibetan Plateau. Model simulated foliage projective coverage (FPC) and plant functional types (PFTs) are selected for the investigation. The model is evaluated first using both field surveyed land cover map and MODIS LAI images. Long term trends of vegetation FPC is examined. Decadal variations of vegetated and barely vegetated land are compared. The impacts of extreme precipitation, air temperature and CO<sub>2</sub> on the expansion and contraction of barely vegetated and vegetated areas are shown. The study will identify the dominant climate factors in affecting the desert area in the region.