**Impacts of climate change and human activities on NDVI changes in the Central and Western Asian Economic Corridor during 2013 - 2022**

Wang K.M. 1,2, Wang S.H.1, Wang L. 3 , Tian H.J.3 , Liu Z.J.4, Xu M.1 ,Cao C.X.1,\*

1 Key Laboratory of Remote Sensing and Digital Earth, Aerospace Information Research Institute, Chinese Academy of Sciences. China

2 University of Chinese Academy of Sciences, China

3Academy of Forestry Inventory and Planning, State Forestry and Grassland Administration, China

4 Southwest Survey and Planning Institute of National Forestry and Grassland Administration, China

[\*caocx@aircas.ac.cn](mailto:*author@gmail.com)

***ABSTRACT***

The implementation of the "The Belt and Road" initiatives have brought great economic benefits to the countries along the route, and Central and Western Asia, as a key link of the " The Belt and Road", demands attention to the changes of the regional environmental health during the construction process due to its fragile ecological environment. Based on MOD13A3 NDVI data and ERA5 meteorological reanalysis data, this study analysed the spatial and temporal evolution of NDVI in Central and Western Asia during the ten years of the implementation of the Belt and Road policy by using the trend analysis method, and explored the impacts of climate change and human activities on the changes of NDVI and their relative contributions by using the multivariate regression residual analysis method. The results indicated that NDVI in Central and Western Asia has shown a decreasing trend over the past decade, with an average rate of -0.26×10-2a-1, and 50.74% of the region exhibited insignificant degradation, with significant degradation in the hilly areas of Kazakhstan in the north, in the low-altitude areas bordering the Tien Shan and Hindu Kush mountains, and in the central part of the region, and significant restoration in the hinterland of Kazakhstan and the coastal areas of the Caspian Sea. With 65.24% of the region's NDVI changes inhibited by climate change and 49.64% facilitated by human activities, the combined impacts of human activities and climate change are the main causes of NDVI changes in the region, with human activities contributing 60.65% of the increase in NDVI and climate change contributing 39.35% on average. This study clarified the driving factors of vegetation change in Central and Western Asia since the implementation of the "The Belt and Road" initiative, which can provide scientific support for the sustainable development of the the Green Belt and Road Initiatives.

**Keywords:** The Belt and Road Initiatives, Central and Western Asia, multivariate regression residual analysis, driving force