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Climatic and human impacts on the ligneous cover in the Sahel from analysis of aerial photographs before and after the drought periods of the 70's and 80's

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The purpose of the work is to retrieve the major changes in the spatial organization of the ligneous cover in the Sahel due to the climate variability during the last fifty years from the comparison between ancient aerial photos and recent high resolution panchromatic remotely sensed images.
Vegetation may be considered as one of the essential resources for the rural societies of the Sahel.
Degradation of vegetation cover which has followed the decrease in rainfall from the early 1970s to the mid 1990 have often been considered as a premonitory sign of non reversing desertification.
In Sahelian regions, vegetation cover becomes more and more discontinuous with the increasing of dryness and demographic growth. This phenomenon, called 'patchiness' is a good indicator for climate stress.
According to some topoedaphic and societal conditions, patchiness leads to various kinds of facies of the ligneous cover from dotted spatial organizations to banded ones, well known as tiger bush. As shrub is overexploited by rural populations for pastoral and domestic use, contraction of the vegetation has negative consequences on human activity in the whole Sahelian zone.
In the context of the rainfall increase all over the west African Sahel since the second part of the 1990s, a widespread increase in vegetation productivity has been detected at regional scale. Although, some local observations of recent land clearance seem to be contradictory with such recent greening of the Sahel. As a matter of fact, human actions such as intensive farming and urbanization as a response to recent demographic increase in West Africa have also strong impacts on the degradation of ligneous cover.
In order to shed light on the respective parts of climate, environment and human practices in the sahelian vegetation dynamics at local scale in various sahelian sites , a comparison between aerial photographs taken before the severe droughts in West Africa of the 70 and 80's and after the increase of precipitations at the end of the 90's, is achieved..
On aerial photographs, ligneous cover appears as spatial patterns of scattered dark spots of various size. The variation in the spatial organisation of the ligneous cover is quantified here through a method based on granulometric analysis on images.