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Assessment of Desertification Processes in a Subtropical Area of Northeastern Mexico

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Abstract

The northeastern Mexico is located in a subtropical region, due to extreme climate with scarce and torrential rains, the soil of agriculture and livestock areas are losing their physical, chemical and biological properties which reduce their productive capacity and make it necessary to open up more areas with natural vegetation for agriculture.

We evaluated the soil use changes in a region in northeast of Mexico particularly in the state of Nuevo Leon and identified the areas subject to erosion process using a digital process for 7 Landsat ETM images and 24 SPOT images acquired between 2001 and 2004. The results showed that areas with bare soil involve nearly 3.7%of the state for 2001 and 4.5 % for 2004.

A field sampling was carried out to assess the structure of different types of vegetation and soil characteristics to compare the soil variables from the surrounding areas with livestock and agriculture use.

Soil samples in each sample plot were taken, as well as were analysed in the laboratory, where several variables were identified such as: organic carbon, salinity, pH and organic matter for each one. Significant differences were detected in soil properties between forests and scrub and nearby areas of agriculture and grasslands. The pine forest presented a higher content of organic matter (27 %), neutral pH and very low salinity (11 %), in contrast with the Mezquital areas that had a low content of organic matter (4 %), high salinity and sodium (21 % And 38 %) respectively, low organic carbon content (4 %) and an alkaline pH.

Keywords: Desertification, ecosystems degradation, erosion processes, soil degradation. land use changes

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