Long-term land use change and effects on soil carbon content in semiarid grasslands

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The area of semiarid grasslands in Mexico is shrinking at unprecedented rates. All forms of land use change including land conversion to rain-fed agriculture, overgrazing, introduction of exotic grass species, and shrub encroachment have led to drastic changes in plant species composition, productivity and plant cover. We examined the effect of long-term land use change on the carbon stocks of: pristine grassland (P), heavily grazed grassland (H), reconverted grassland to African grass pasture (E), and shrub encroached grassland (S). We observed a range of soil carbon content between 22 (P) and 9 (E) T/ha. Overall, the E site exhibited the lowest soil carbon accounting for 30% less than P. Both, E and S exhibited highest carbon content on interspaces and allocated carbon preferentially at 30 cm depth compared to 15 cm for the P and H communities allocated preferently under the plant.

**APPROACH**
4 sites
- Moderately grazed (pristine)
- Heavily grazed
- African grass pasture
- Shrub encroachment

2 microsites
- Below grass plant (BP)
- Interspace (I)

2 soil depth
- 0 - 15 cm
- 15 - 30 cm

At each site: 8 locations (100 m apart ) along a transect

**Vegetation cover**

**Soil organic matter**

**Total carbon (ton/ha)**

**Conclusions**

Important differences in Total Carbon distribution in soils were observed among the four forms of land change use in semiarid grasslands. In general terms, deterioration of Grasslands or conversion to African grass pastures decreases the amount of carbon in soils. We also observed important changes in allocation of carbon. Both, the African grass pasture and the encroached grassland distributed C preferentially at the interspaces and deeper.

We still do not know about the effect of this changes in C Accumulation in soils in other functional aspects of ecosystems.