Geophysical Research Abstracts
Vol. 12, EGU2010-12087, 2010
EGU General Assembly 2010


# Effects of urban development on carbon sequestration in Karaj County, Iran.

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Abstract
Soil organic matter content is a quality indicator for soil, agriculture and environment. Organic matter is responsible for soil aggregation, nutrients supplying and water holding capacity, therefore it is important for plant growth. Input and decomposition of soil organic matter determines the amount of soil organic carbon. Carbon occurs in soils in both organic and inorganic forms. In soils which have formed on carbonatic parent materials or those which located in arid and semiarid regions large amount of primary and secondary carbonates are dominated while organic carbon is dominated form of carbon in other areas. Soil organic matter varies from fresh plant litter to amorphous humic components. Land use change is an important factor that affects terrestrial and thus atmospheric carbon. The aims of this study are exploring the effects of land use change and urban development on soil organic carbon and dynamic due time.
The study area is located on north central Iran, between 35° 41´- 36° 01´ N and 50° 42´- 51° 14´ E. Mean annual precipitation about 243.8 mm and mean annual air temperature is about 14.95 [U+25E6]C. The soil moisture and temperature regime vary between aridic-thermic in lower altitudes to xeric-mesic in upper altitudes. 27 surface soil samples (0-20cm) were collected from different land uses for studying carbon dynamic. After preliminary routine analyses of soil samples, 10 sites were selected for further sampling with three times intervals in September, January and April 2008. Physical and chemical properties of soil such as pH, EC, Na+, K+, Ca2+, Mg2+, Cl-, HCO3-, CO3 2-, N %, texture, OC % and SP were measured according to the standard methods.
The reduction of vegetation cover due to land use change was objected from comparison between ETM+ image (2008) and aerial photographs were taken in 1956. The results showed that soil organic carbon and nitrogen varies between 0.2 to 2.81 and 0.02 to 0.23 respectively. Differences between the amount of organic carbon from the end of growing season to the next growing season, use as an index for carbon dynamic in studied soils and shows variation in different land use. Comparison of land use change map showed that of 5985.6 hectares of farms, 15508. 749 hectares of pasture and 254.337 hectares of orchards have changed to urban land use. This land use change prevented from 126290.7 MgC to sequestrate that this amount is equal to 463065.9 Mg CO2 which released to atmosphere. With regarding to the pollutants and combustion of fossil fuel, its magnitude can reach to several times greater.