



Deforestation effect on soil quality and climate change.

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This study was carried out to evaluate the effects of deforestation on physical and chemical properties of soils under native forest in the Mediterranean region of northwestern Jordan and its impact on climate change. Land use/cover maps of 1953, 1978 and 2002 were interpreted and analyzed to quantify the shift from forest to rainfed cultivation. Six sites were sampled in a non changed forest and in cultivated fields, three for each. Different soil properties of texture, bulk density, organic matter, total nitrogen, pH, cation exchange capacity, phosphorous and potassium were analyzed. Results showed that many forests were changed into cultivated lands at a rate more than the reforestation. Subsequently, adverse effects on the studied physical and chemical properties were observed. The most affected properties were particle size distribution, bulk density of surface soil and subsoil. Organic matter and cation exchange capacity decreased in cultivated soil as compared to the forest soil. Cultivated soils were found to exhibit a significantly lower status in physical and chemical soil properties as compared to forest soils. This general decline in the soil physical and chemical properties, in turn, contributed to soil erosion, reduction of soil fertility, and land degradation and decreased C sequestration which can lower the amount of CO₂ and mitigate green house effect.

There is an urgent need to improve soil quality by developing sustainable land use practices to reduce the rate of soil degradation and to ensure long-term sustainability of the farming system in the study area and in similar biophysical settings in order to preserve soil quality to mitigate greenhouse effect that contributes to climate change.

Key Words: deforestation, soil quality, climate change, Mediterranean.