A study was carried out to investigate the effect of land use changes on soil quality attributes. Land use practices affect the distribution and supply of soil nutrients by directly altering soil properties and by influencing biological transformations in the rooting zone. Soil quality is a concept that integrates soil biological, chemical and physical factors into a framework for soil resource evaluation. In order to do this research some paper about the effects of land use changes on soil quality were studied. The evidences provided by this experiment indicated that deforestation and land use changes causes organic carbon (OC), organic matter (OM), total nitrogen, available potassium, soil microbial respiration (SMR) and mean weight diameter (MWB) to be decreased. Deforestation and land use changes cause bulk density (BD) to be increased.

Key words: Soil, Deforestation, Organic Matter, Potassium, Nitrogen.

Introduction

The complex integration of the primary natural resources — soil, water and vegetation, is vital for maintaining terrestrial ecosystem functions and productivity (Islam and Weil, 2000). Increase in population and a continuous decline in the amount of agricultural land have led to an indiscriminate exploitation of natural forests and fragile lands for agriculture. Soil organic matter and soil nutrient depletion are among the major forms of soil degradation (Khademi et al., 2005). At present, 97.4% of national land area is grassland and about 70% of which is under the overgrazing (Honisho, 2006).

Land use practices affect the distribution and supply of soil nutrients by directly altering soil properties and by influencing biological transformations in the rooting zone. For instance, cultivation of forests diminishes the soil carbon (C) within a few years of initial conversion and substantially lowers mineralisable of nitrogen (N) (Majaliwa et al., 2010). Soil quality is a concept that integrates soil biological, chemical and physical factors into a framework for soil resource evaluation (Khormali et al., 2009).

Land use changes, especially cultivation of deforested land may rapidly diminish soil quality, as ecologically sensitive components of the forest ecosystem are not able to buffer the effects of agricultural practices. As a result, severe deterioration in soil quality may lead to a permanent degradation of land productivity (Khormali et al., 2009).

Deforestation is believed to diminish soil quality and lead to a permanent degradation of land productivity. Larson and Pierce (1991) defined soil quality as the capacity of a soil to function within the ecosystem boundaries and to interact positively with surrounding ecosystems (Khormali and Shamsi, 2009). Conversion of forest and grasslands into agricultural land is one the main concerns worldwide in the context of environmental degradation and global climate change (Khormali et al., 2009).

Yousefifard et al. (2007) investigated decline in soil quality as a result of land use change in
Cheshmeh Ali region (IRAN). Results showed that the organic matter, available phosphorous, cation exchange capacity, microbial respiration and mean weight diameter (MWD) decreased.

Hajabbasi et al. (2007) studied the effect of rangeland change to agricultural land on some soil physical and chemical properties in South of Isfahan. These results showed rangeland change to agricultural land caused significant changes in bulk density, pH, EC and mean weight diameter.

Lemenih (2004) investigated the effects of land use changes on soil quality and native flora degradation and restoration in the highlands of Ethiopia. Results showed deforestation and then long-term cultivation caused organic matter and total nitrogen decreased and also changes in soil surface (0-10 cm) indicated phosphorous, potassium, available potassium, Ca+Mg, saturation point and cation exchange capacity.

In this study the effects of land use changes on soil quality attributes has been investigated.

**Results and Discussion**

**Organic Carbon (OC):**

Deforestation and land use changes in deferent slope position cause organic carbon (OC) to be decreased. This is in line with the findings of Hajabbasi et al. (2007), Khormali et al. (2009) and Khormali et al. (2005).

Fallahzade and Hajabbasi (2011) observed particulate organic carbon (POC) is preferentially lost when soils under pasture converted to cultivated fields.

**Organic Matter (OM):**

Deforestation and land use changes in deferent slope position cause organic matter (OM) to be decreased. In investigating the effect of land use changes on soil quality attribute Yousefifard et al. (2007), Khormali et al. (2009), Hajabbasi et al. (2007) and Lemenih (2004) find the same results about that the deforestation and land use changes cause organic matter (OM) to be decreased.

Soil carbohydrates and particulate organic carbon (POC) as soil organic matter (SOM) indicators are sensitive to changes in land use. Land use changes, especially cultivation of native lands in temperate and tropical areas have led to negative effects on SOM components (Fallahzade and Hajabbasi, 2011).

Cultivation is the most important factor that it is effective in acceleration reduction soil organic matter. Increased erosion is another factor that it is effective in acceleration reduction soil organic matter in soil surface (Yousefifard et al., 2007).

**Total Nitrogen (N):**

Deforestation and land use changes in deferent slope position cause total nitrogen (N) to be decreased. This is in line with the findings of Khormali et al. (2009), Yousefifard et al. (2007), Khormali et al., (2005) and Lemenih (2004).

**Available Potassium (K$_{ava}$):**

Deforestation and land use changes in deferent slope position caused available potassium decreased. In investigating the effect of land use changes on soil quality attribute Khormali et al. (2009), Lemenih (2004) and Hajabbasi et al. (2007) find the same results about that the deforestation and land use changes cause available potassium carbon to be decreased.

Coarser soil texture, lower CEC, lack of permanent vegetative cover and water erosion are the main possible reasons for the loss of available potassium in the deforestation, intensive cultivation and application of urea which is an acidifying fertilizer might be also an important reason for lower available potassium in deforestation (Khormali et al., 2009).

**Cation Exchange Capacity (CEC):**

Deforestation and land use changes in deferent slope position cause cation exchange capacity to be decreased. This is in line with the findings of Yousefifard et al. (2007), Lemenih (2004) and Khormali et al. (2009).
Decrease in CEC reflects the textural and OM changes in deforestation (Khormali et al., 2009).

**Mean Weight Diameter (MWD):**

Deforestation and land use changes in deferent slope position cause mean weight diameter (MWD) to be decreased. In investigating the effect of land use changes on soil quality attribute Hajabbasi et al. (2007), Khormali et al. (2005), Celik (2005) and Yousefifard et al. (2007) find the same results about that the deforestation and land use changes cause mean weight diameter (MWD) to be decreased.

Two major factors are effective in the formation and stability of aggregate. These are presence adhesive material (such as organic matter and cations) and the time needed for the impact factors. Any these factors are more limited then aggregate and structure stability are more limited (Hajabbasi et al., 2007).

**Soil Microbial Respiration (SMR):**

Deforestation and land use changes in deferent slope position cause soil microbial respiration (SMR) to be decreased. This is in line with the findings of Yousefifard et al. (2007) and Khormali et al. (2009).

Soil microbial respiration is indicated microorganisms activity. There is more organic material in forest and rangeland with good vegetation cover is reason increased microbial activity. More activity microorganisms in grassland and forest are due to plant roots, plant residues and more organic matter (Yousefifard et al., 2007).

**Bulk Density (BD):**

Deforestation and land use changes in deferent slope position cause bulk density (BD) to be increased. In investigating the effect of land use changes on soil quality attribute Khormali et al. (2009), Yousefifard et al. (2007) and Lemenih et al. (2005) find the same results about that the deforestation and land use changes cause bulk density (BD) to be increased.

**Conclusion:**

Many studies have been done about the effects of land use changes on soil quality attributes and these results showed deforestation and land use changes causes organic carbon (OC), organic matter (OM), total nitrogen (N), available potassium ($K_{av}$), soil microbial respiration (SMR) and mean weight diameter (MWB) to be decreased. Deforestation land use changes cause bulk density (BD) to be increased.

**References**


