The Study of Past Environmental Hazards Based on Paleopedological Deposit Properties in Tabriz Plain

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1. Introduction

Each change in environment conditions or climatic conditions is a cause of wind and water erosion process changing and also for environmental hazard events. Changing at physical and chemical soils property occurs due to a change in the erosion process. All this changing is reflected on grain type of sediments and form of deposits stratum. With due attention to historical documents, environment hazards have occurred repeatedly in the past time, including droughts, floods, earthquakes and also high snow precipitation in Tabriz Plain. Geo-process and biome is affected within these events in the plain during of past time. The Plain of Tabriz was highly sensitive to human changes and climate change. With the change in the climate of the northern region from 3000 to 4500 years ago people migrated to the plain of Tabriz and changed the characteristics of the plain by cultivation or other activities. These activities and occurrence of floods and droughts dramatically changed the environment and evidence of these changes remained in the deposits.

2. Material and Methods

In this paper paleo-pedological data are used for the dating of Tabriz plain deposits. The chemical and physical properties of the deposits have been studied and tested. Various samples of soil have been collected and examined in the laboratory. The PH, SO4, CL, content of the collected samples was measured and determined. Specimen deposits were used to collect specimens at depths below 3 m that exhibited different characteristics. Geomorphological methods are other methods to understand the past story of plain that used. SED methods are geomorphological methods used in this study.

3. Results and Discussion

Changes in the amount of SO4 deposits indicate major environmental changes in the Tabriz plain. When environmental SO4 changes were less than 300 ppm, environmental conditions changed. The environment would be more humid. When SO4 reaches 2,500 or more, the environment becomes drier. The results of the studies show that the amount of SO4 at lower depths and in the lower deposits is high. This indicates that

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Tabriz plain has undergone many changes and the environmental conditions of the whole have changed. These findings suggest that the drought was severe. In 10-15 depth of underground amount of salt is very high. In study area rate of Cl is vary from 3 to 12 m/a/l. The rate of TDS is low. The study of PH at environment changing understanding is very important. In study area PH from 8.6 to 8.3 is vary. Lowland have low PH. Examination of aggregate deposition reveals the soil texture is clay–silt and clay-loam. Wildfires and excessive use of land are the cause of the fine texture of soils. At a depth of 20 meters 50% of the volume of deposits is composed of clay. In some parts of the old clay plain more than 80%. The large amount of clay in the deposits indicates significant environmental changes in the past. The results show that the carbon content in the upper layers is high. When grazing livestock is growing, either drainage is poor or plants plant density is low, the amount of carbon is increased. High fluctuations in chloride levels mean significant changes in environmental conditions. The high chloride concentration indicates the occurrence of environmental drought. The samples taken show an increase in the chloride content in the various sections of plain. 8000 ppm chloride in Tabriz plain indicates that significant changes have occurred in this plain at Pleistocene period. The fine-grained material has been deposited at times where the ambient energy was at its lowest level. Chloride formation or chloride stability near the surface of the sediments is more related to the colder climate.

4. Conclusion

Examination of different samples of deposits reveals past environmental conditions. In the past, floods and droughts have occurred in larger and more severe dimensions. Occasionally, the climate becomes drier and accumulates more salt in the deposits. The sandy texture of the deposits indicates the intensity of the winds in the Tabriz plain. Sandy materials at around plain and exposed soils ware important sources of aeolian material into Tabriz plain. The sand in mountain areas ware mostly of volcanic origin, either deposited as volcanic ash or reworked by physical weathering of volcanic rocks by glaciers, glacial rivers and other physical factors. Higher areas had drier conditions and their soil was mostly Claysols. Maximum cumulative thickness of silt soil and salt deposits in the soil profiles was measured as 20 cm whereas average thickness was 10 cm. The thickness of clay layers varies in different parts of Tabriz plain.

Keywords: Environment Hazard, Paleopedologic, Paleoclima, Tabriz Plain

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