DEDICATION

This research is dedicated to my parents..............
brothers.............. Sisters.............. to my entire honorable
teacher especially those who taught me in Soil and Water
Sciences Department and in particular Dr. Al abbas Doka
Mohamed Ali who supervised the completion of this research.
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Firstly I would to thank my teacher Dr. Al abbas Doka who supervised this research project and offered all his experience and efforts to complete this study, Also my thanks go to my friends Ahmed Foddl Naga and Musa Bahkit who helped me in field works when digging the profiles.

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ABSTRACT

This study was conducted in the pilot farm of Um Bayada Agricultural Project which is located in northern Darfur state between latitude 15 degrees north and between longitudes 27 1/2 and 26 1/2 degrees west. The main road which connects Al-Fasher to Hamrat Al-Sheikh in North Kordofan runs across Um Bayada area. Al-Meidoub dome and associated subsequent uplifts have influenced local and regional sequence of land formation and degradation. The dominate land topography in the study area is almost depressional cracking clay plain of the Um Bayada alluvium deposits. The climate of the study area is Semi-Desert type. Three main types of vegetations in the study area are Qoz vegetation, Basement vegetation and alluvium vegetation. The Water resources were Surface water and Underground water and so three major land use types are Traditional farming (rainfed), Traditional animal breeding and Wood cutting.

This study aimed to characterize the soil of pilot farm, illustrating their variability, assess the land suitability for some selected main crops with defining the main soil constraints in relation to crop production and suggest sustainable soil management practices. The Grid soil survey method was followed in this study which involved field descriptions and taking of representative soil samples at intervals of 100 m apart dug with deep depth (200m). The collected soil samples were analyzed at the Soil and Water Sciences Dept. laboratory at Shambat. Laboratory chemical and physical characteristics include mechanical analyses, electrical conductivity (EC), Soil pH, soluble anions and cations and fertility status (nitrogen, phosphorus and potassium) based on soil sample extracts.

Three different soil geomorphic units have been identified which are Depression cracking clay plain (DC), Cracking clay plain with gently undulating slope (CC), and Clay with very thin sand sheet (CS). The pilot is mainly composed of one map unit (75%) with consociations of minor inclusions of similar soil with different top soil phases. The soils were classified according to USDA soil taxonomy as Vertic Haplocambids. The results of field descriptions and laboratory analyses revealed that the soil of the pilot farm, has low to moderate permeability depending of dominant clay texture, none saline (0.3-2.5ds/m), slightly alkaline (7.6-8.0), with fertility limitations (S2f). According to soil suitability system the study find maximum of soil in class one (S1) with some limitations in class two (S2). The study recommended the soils of the pilot farm require a good soil conservation practices such as adding organic matter and plant cover to avoid the damaging effects of soil erosion. Good farming practices such as bush fallow and modern irrigation methods should be practiced for soil nutrient replenishment.
**مستخلص البحث**

أجريت هذه الدراسة للتحقيق في الزراعة النموذجية لمزرعة أرضية الزراعي الذي يقع في الجهة الشمالية الشرقية من ولاية شمال دارفور بالقرب من مدينة الملح حاضرة قلب ميناء كفردا، حيث يتمتع المزرعة بالمنطقة المحيطة بالجبال، والمحمية من الرياح الشديدة. درست هذه الدراسة تأثير الزراعة على التربة، وتغذية النباتات، وتوزيع الصوريات، ودراسة تأثيرات التربة وتحديد النباتات المستخدمة في المزرعة في المدى المتبقي.

تم تطبيق مستوي الحمضية في المزرعة النموذجية بالطرق التقليدية، حيث تم حساب عينة شرائحية بالرش عينة من ماء محلي عمقه 100 سم. وتعد هذه العينات كمصدر للدراسات البيئية، وتعتبر معاملة البذور بالرطوبة والرطوبة الفاكهة، وتحلية التربة، وتوزيع التربة، وتوزيع النباتات المستخدمة في المزرعة.

من خلال تحليلات النتائج، وجدت أن تربة المزرعة النموذجية ذات تربة منخفضة أو متوسطة منخفضة أو متوسطة (S1، S2)، مع وجود مشكلة خصوصية تهدى التربة، وتحديد صلابة الأرضية، ومصادر مياه الأراضي، وسمك الأراضي، وعمق الأراضي، ومصادر مياه الأراضي، وعمق الأراضي، ومصادر مياه الأراضي.

وقد تم استيعاب تربة المزرعة النموذجية من خلال استيعاب التربة، وتحديد صلابة الأرضية، ومصادر مياه الأراضي، وعمق الأراضي، ومصادر مياه الأراضي.

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