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Land Suitability Classification for Crops in Some areas in Giza Governorate, Egypt: A Comparison Between Sys and MicroLEIS Models

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Abstract: The area under investigation located in Giza Governorate and bounded by longitudes 31º 00` and 31º 20` east and latitudes 29º 15` and 30º 00` north and representative by fortin profiles were dije and descripted and colleted the samples to make the different analysis. Based on the morphological, physical and chemical analyses the soils classified as Typic Torrifluvents in the wind born deposits and Typic Calciorthids and Typic Torrifluvents in alluvial colluvial deposits. The soils of the area classified based Micro LIES model to ranged between high and marginal suitable for wheat, corn, melon, potato, sunflower, citrus, olive, and peach, while it is ranged between high and moderate for alfalfa, soybean and ranged between optimum and moderate for cotton and sugar beat while sys model classified the soils to ranged between moderate and marginal for wheat, potato, citrus, olive, soybean, and peach, but it is ranged between high and moderate suitable for corn, cotton, sugar beat, while it is ranged between high and marginal for melon, and moderate suitable for alfalfa. From the classes of soil suitability for the two models clear that the suitability for the same crops, are different which could be referred to the MicroLIES depend on soil profile depth, drainage, texture, $CaCO_3$ content, salts content, ESP % while sys model add to the previous mentioned properties soil topography, coarse fragment, gypsum, cation exchange capacity, and organic matter content, for this the first model depend on the soil is virgin while the second depend on the soil cultivated and the sys model depend on some properties very important as indicator for the fertility of the soil and the level of the management and improve the management to produce the optimum yield.

Key words: morphological, fertility, suitability, management, topography

INTRODUCTION

To meet the quickly increasing in the population requirement is important used the vertical and horizontal expansion in the reclamation and cultivation of the desert soil. The area under investigation which located in the eastern and western side of Nile Valley in Giza Governorate (Fig. 1) is the one of the important areas in the expansion areas in Egypt. Land suitability is the very important step in the reclamation of the desert to determine the suitable crops for the different soils to produce the high yield to meet the requirement of the population. To make the evaluation two models can be used the first is MicroLEIS (Integrated Package) de la Rosa *et al* (2000), and the second is the methodology produced by Sys *et al* (1993), FAO (1985).

The metrological data of El-Giza (2004) show that the maximum temperature ranged between 26.60 and 29.30 °C while the minimum ranged between 12.30 and 12.70 °C. The amount of annual rainfall is very low and ranged between 23.6 and 27.4 mm/year, the main annual wind speed ranged between 3.1 and 4.5 m/sec. According to the soil survey staff (1999) the soil temperature and moisture regimes could be classified as the thermic and Torric.

According to Said (2000) the Western Desert west the Nile Valley is one the most arid regions in the world, and surface composed of bar rocky plateau and high-lying stony and sand plains, but few distinct, and consequently do not reach the Nile Valley. The Eastern Desert east of the Nile Valley is mountain in some parts, and dissected by deeply incised Valley in the remainder part that travel in its interior has generally to confine to the line of drainage.

According to Sadek (1980) the $CaCO_3$ content and sand fraction increased to reach the highest amount when approaching to the desert. O.M content is generally low and decreased with depth. Kishk *et al* (1980) conclude that the eastern fringes characterized by a low amount of soluble salts and cation exchange capacity. Abu El-Enain (1981) mentioned that the alluvial wind born deposits west of the Nile Valley in Giza

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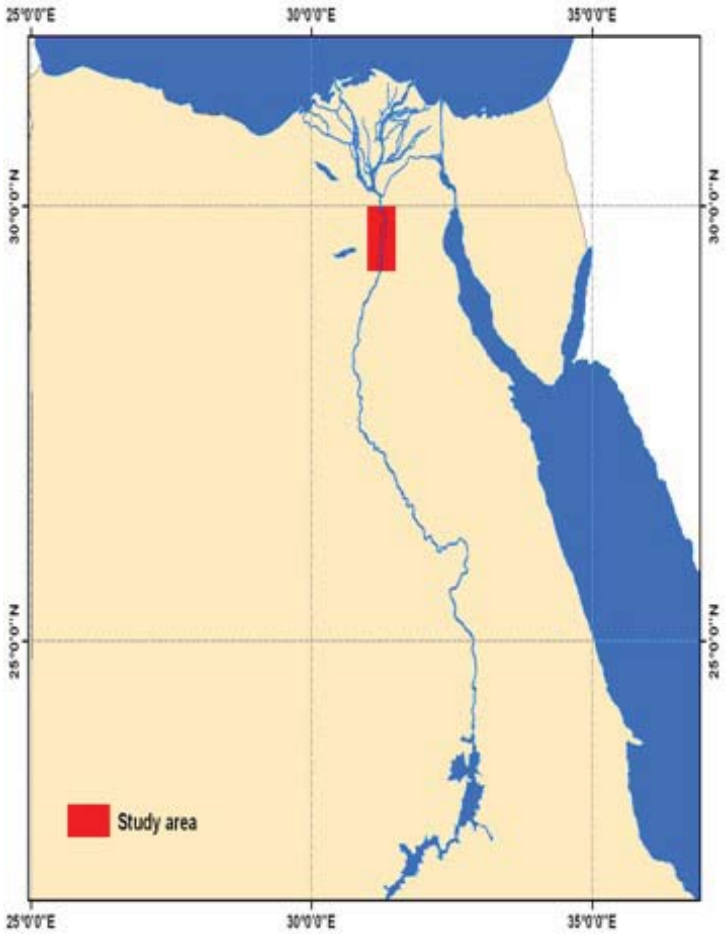

Fig. 1: Location of the studied area

Governorate are stratified in the texture as sandy to loamy sand and the soils could be classified as Torripsamments and Torrifluvents. According to the Ministry of Agriculture (2000) the actual land use of the investigated differs according to the period of reclaimed. In the old land tradition settlement as the old culture of the Egyptian farmers are occurred, roads are narrow but connected the small villages with major towns. In the newly reclaimed areas the settlement includes some modern manufactories and wider roads.

MATERIAL AND METHODS

Fourteen soil profiles were choosing to represent the different map units of the investigated area. Brief descriptions were worked out for the soil profiles in the field according to FAO (2006), and then a number of 51 disturbed samples were collected for the lab analyses. The texture, and chemical analysis as pH, OM, $CaCO_3$, gypsum, EC, soluble cations, soluble anions, CEC, exchangeable cations determined using USA (2004). Also some macronutrients (NPK) and micronutrients (Fe, Mn, Zn, Cu) determined using USA (2004) soil classified based on soil Taxonomy USA (2000, 2006). Agro-ecological land quality evaluation was determined using Micro LEISIPC (integrated package) Pro & Eco model (de la Rose *et al*., 2000), FAO (1985) and Sys *et at* (1993).

Using GIS to Produce the Final Maps:

Data input is the operation of interring both types of data, spatial and non spatial, into the GIS. The spatial data were input by digitizing the topographic maps scale 1:50.000, final project produced by (EGSA group 1992), controlled ortho-photo of Giza governorate, (EGSA group 1986), and the geological map of Egypt

produced by Ministry of Industry and Mineral Resources (1981), using manual of Digital Resource Systems (1991). Attribute data were the main tainted in data base management system represented by Arc view's table model and Excel spread sheet. Maps were layered into a group of features; each of them comprises a homogenous dataset. This step yields a digital vector data base for the studied area. The principle thematic layer is the soil map, where all other information is related to its polygons. For geometric correction, the coordinates were converted to the universal Transverse Marcater system using the ARC/INFO function project.

RESULTS AND DISCUSSION

The area under investigation located in Giza Governorate and bounded by longitudes 31º 00` and 31º 20` east and latitude 29º 15` and 30º 00` north in the interference zone between Nile Valley and the desert, based on the aerial photo interpretation and field check the physiographic map was produced (Fig. 2), the legend of the produced map is shown in Table (1), which reveal that the main physiographic units are:-

Table 1: Physiographic map legend

Landscape	Relief	Land form	Phase	Mapping unit	Kind of mapping unit	Main and associated soils	Area km2	Area %
Eastern	Summit	Flat Summit	Barren	EP1	Consociation	Torriorthents	404.21	9.24
Plateau	Steep Slops	Steep Slops	Barren	EP2	Consociation	Torriorthents	771.78	17.65
	Slops	Slops	Barren	EP31	Consociation	Torriorthents	223.65	5.11
			Cultivated with crops	EP32	Consociation	Torripsamments	21.85	0.50
			Cultivated with crop and Orchards	EP33	Consociation	Torripsamments	60.27	1.38
Dry valleys	Concave slop	undulating Barren		EV	Consociation	Torriorthents	210.89	4.45
Sand sheet	Gently undulating	Relatively high Parts	Cultivated with crops	AC11	Consociation	Torrifluvents	34.74	0.79
			Cultivated with crop and Orchards	AC12	Association	Torrifluvents Torripsamments	56.64	1.30
		Relatively low Parts	Cultivated with crops	AC21	Consociation	Torrifluvents	40.86	0.93
			Cultivated with crop and Orchards	AC22	Consociation	Torrifluvents	40.83	0.93
Landscape	Relief	Land form	Phase	Mapping unit	Kind of mapping unit	Main and associated soils	Area km2	Area %
Western	Summit	Flat Summit	Barren	WP 1	Consociation	Torripsamments	248.49	5.68
Plateau	Steep Slops	Steep Slops	Barren	WP 2	Consociation	Torripsamments	291.59	6.67
	Slops	Slops	Barren	WP 31	Consociation	Torripsamments	728.92	16.67
			Cultivated with crops	WP 32	Consociation	Torripsamments	21.61	0.49
			Cultivated with crop and Orchards	WP 33	Consociation	Torripsamments	23.72	0.54
Dry valleys	Concave slop	undulating	Barren	WV	Consociation	Torripsamments	110.54	2.33
Sand sheet	Gently undulating	Relatively high Parts	Cultivated with crops	AW 11	Consociation	Torrifluvents	44.2	1.01
			Cultivated with crop and Orchards	AW 12	Consociation	Torrifluvents	35.32	0.81
		Relatively low Parts	Cultivated with crops	AW 21	Consociation	Torrifluvents	73.1	1.67
			Cultivated with crop and Orchards	AW 22	Consociation	Torrifluvents	41.19	0.94

The Alluvial-Wind Born Deposits:

General Description:

Alluvial-Wind born soils elevation ranged between 60 and 66 m asl occupying an area of 193.81 Km^2 (i.e. 52.83 % of the total area). The data in Table (2) reveals that the land form and topography differ from flat and almost flate, the slope varies fron nearly level to gently sloping, the parent material mixed between Nile Valley Sediments and the Sediment of Western Desert, the land use ranged between cultivated with crops,

orchards, vegetables and mixed, the drainage ranged between well in the high parts and poorly in the low parts, the ground water table ranged between 75 cm in the low parties and 130 cm in the high parties, surface irrigation is the dominant except small area used drip irrigation.

Table 2: Morphological description of the investigated area

Profile No.	Mapping unit	Soil climate	Land form	Slope	Landuse & irrigation	Drainage	Ground water	Depth in cm	Texture class	Structure	Consistance			Roots	$CaCO_3$	Boundary
											weit	moist	dry			
1	AW11	Torric and Thermic	Almost flate	Nearly level	Cultivated with and surface irrigation	well	> 120cm	0-20	scl.	mssmsb	mssp	sfi	mh	cfm	h.	G.
								20-40	scl.	mssmsb	mssp	sfi	mh	ffi	h.	cs.
								40-55	st.	sG.	sssp	vfr.	sh	Non	m.	cs.
								55-85	s.	sG.	Non	L.	L.	Non	h.	cs.
								85-120	s.	sG.	Non	L.	L.	Non	h.	…
2	AW12	Torric and Thermic	Almost flat to gently sloping	Nearly level to gently sloping	Cultivated with and drip irrigation	well	> 110cm	0-20	scl.	mssmsb	mssp	sfi	mh	cmfi	m.	d.
								20-50	sl.	sG.	sssp	vfr.	sh	ffi	h.	G.
								50-70	ls.	sG.	Non	L.	L.	Non	h.	cs.
								70-110	s.	sG.	Non	L.	L.	Non	h.	…
3	AW12	Torric and Thermic	Almost flate	Nearly level	Cultivated with and drip irrigation	well	> 130cm	0-20	scl.	mssmsb	mssp	mfi.	mh	cmfi	m.	G.
								20-70	scl.	mssmsb	mssp	sfi	mh	cfi	m.	cs.
								70-90	sl.	sG.	ssnp	sfr.	sh	Non	h.	cs.
								90-130	s.	sG.	Non	L.	L.	Non	h.	…
4	AW21	Torric and Thermic	Almost flate	Nearly level	Cultivated with and surface irrigation	poorly	75 cm	0-20	scl.	mssmsb	mssp	mfi.	mh	cfim	m.	d.
								20-50	scl.	mssmsb	mssp	mfi.	mh	ffi	h.	G.
								50-75	scl.	ssssb	sssp	vfr.	sh	Non	h.	…
5	AW21	Torric and Thermic	Almost flate	Nearly level	Cultivated with and surface irrigation	poorly	75 cm	0-25	scl.	mssmsb	msmp	mfi.	mh.	cfim	m.	G.
								25-45	scl.	mssmsb	mssp	mfi.	mh.	ffi	h.	G.
								45-75	scl.	ssssb	mssp	mfi.	mh.	Non	h.	…
6	AW22	Torric and Thermic	Almost flate	Nearly level	Cultivated with and surface irrigation	well	100 cm	0-30	scl.	mssmsb	msmp	mfi.	mh.	cfim	m.	cs.
								30-60	scl.	mssmsb	mssp	mfi.	mh.	ffi	h.	cs.
								60-100	scl.	ssssb	sssp	sfi	mh.	Non	h.	…
7	AC11	Torric and Thermic	Almost flate	Nearly level	Cultivated with and surface irrigation	moderately well drained	95 cm	0-30	scl.	mssmsb	msmp	mfi.	mh.	cmfi	h.	shs.
								30-55	scl.	mssmsb	mssp	sfi.	sh	cfim	vh.	shs.
								55-80	sl.	sG.	Non	vfr.	L.	Non	s.	G.
								80-95	sl.	sG.	Non	sfr.	L.	Non	s.	…
8	AC11	Torric and Thermic	Almost flat	Nearly level	Cultivated with and surface irrigation	moderately well drained	95 cm	0-20	scl.	mssmsb	msmp	mfi.	mh.	cfim	vh.	G.
								20-50	scl.	mssmsb	mssp	mfi.	mh.	ffi.	vh.	d.
								50-75	scl.	ssssb	sssp	fr.	sh.	Non	vh.	d.
								75-95	Ls.	sG.	Non	L.	L.	Non	s.	…
9	AC12	Torric and Thermic	Almost flat	Nearly level	Cultivated with and surface irrigation	wel	100 cm	0-25	scl.	mssmsb	msmp	mfi.	mh.	cfim	h.	C.
								25-45	scl.	mssmsb	mssp	sfi.	sh.	ffi.	vh.	ss.
								45-60	Sl.	sG.	ssnp	mfr.	s.	Non	vh.	ss.
								60-100	S.	sG.	Non	Non	L.	Non	s.	…
10	AC12	Torric and Thermic	Almost flate to undulating	Nearly level to gently sloping	Cultivated with and surface irrigation	well	100 cm	0-30	Sl.	sssb.	sssp	fr.	sh.	cmfi	h.	cs.
								30-60	Ls.	sG.	Non	Non	Non	ffi.	vh.	cs.
								60-80	Ls.	sG.	Non	Non	Non	Non	s.	cs.
								80-100	S.	sG.	Non	Non	Non	Non	s.	…
11	AC21	Torric and Thermic	Almost flat	Nearly level	Cultivated with and surface irrigation	moderately well	90 cm	0-25	scl.	mssmsb	mssp	mfi.	mh.	cfim	h.	d.
								25-60	scl.	mssmsb	mssp	mfi.	mh.	ffi.	vh.	cs.
								60-90	scl.	mssmsb	mssp	mfi.	mh.	Non	s.	…
12	AC21	Torric and Thermic	Almost flate	Nearly level	Cultivated with and surface irrigation	moderately well	85 cm	0-10	scl.	mssmsb	mssp	mfi.	mh.	cfim	h.	cs.
								15-45	scl.	mssmsb	mssp	mfi.	mh.	ffi.	vh.	sm.
								45-85	scl.	mssmsb	mssp	mfi.	mh.	Non	s.	…
13	AC22	Torric and Thermic	Almost Flat	Nearly level	Cultivated with and surface irrigation	well	130 cm	0-25	scl.	mssmsb	mssp	mfi.	mh.	cfim	h.	d.
								25-60	scl.	mssmsb	mssp	mfi.	mh.	ffi.	vh.	G.
								60-95	Sl.	ssssb	sssp	fr.	sh.	Non	s.	cs.
								95-130	Ls.	sG.	Non	L.	L.	Non	s.	…
14	AC22	Torric and Thermic	Almost Flat	Nearly level	Cultivated with and Surface irrigation	well	120 cm	0-30	scl.	mssmsb	mssp	mfi.	mh.	cfim	h.	G.
								30-70	scl.	mssmsb	mssp	mfi.	mh.	ffi.	vh.	cs.
								70-120	Sl.	sG.	Non	L.	L.	Non	s.	…

The description of the layers of the profiles show that the soil colour is dark in the surface and subsurface and become light in the deep layers according to the high management effect in the surface and subsurface while the third and deep layer their is no effect, the texture also ranges between fine in the surface and subsurface and coarse in the third and deep layers, structure changed from blocky in the surface and subsurface to single grains in the third and deep layers, consistence ranged between hard in the surface and subsurface and loose in the deep layers, the effervescence ranged between high in the deep layers and moderate in the surface, the boundary ranged between clear smooth, Gradually and diffuse, and the new formation ranged between soft concretion and hard nodules of $CaCO_3$ and gypsum.

Table (3) show that the texture is sandy clay loam in profiles 4, 5 and 6, while is sandy clay loam in the surface and subsurface, sandy loam in th third and sandy in the deep layer in profile 1, 3, and sandy clay loam in the surface, sandy loam in subsurface, loam sand in the third and sand in the deep layer in profile 2. Cation exchange capacity values varied from layer to another and ranged between high in the surface layers to reach 35.44 mq/100 g soil in sandy clay loam texture and 2.22 mq/100 g soil in sandy layer.

The data in Table (4) reveal that the pH values of the soil ranged between 7.23 and 7.93 which indicated there is no alkalin, O.M content is low and decrease with depth and ranged between 1.87 % in the surface layer and 0.26 % in the deep layer, $CaCO_3$ content varied from layer to another and low in the surface layer

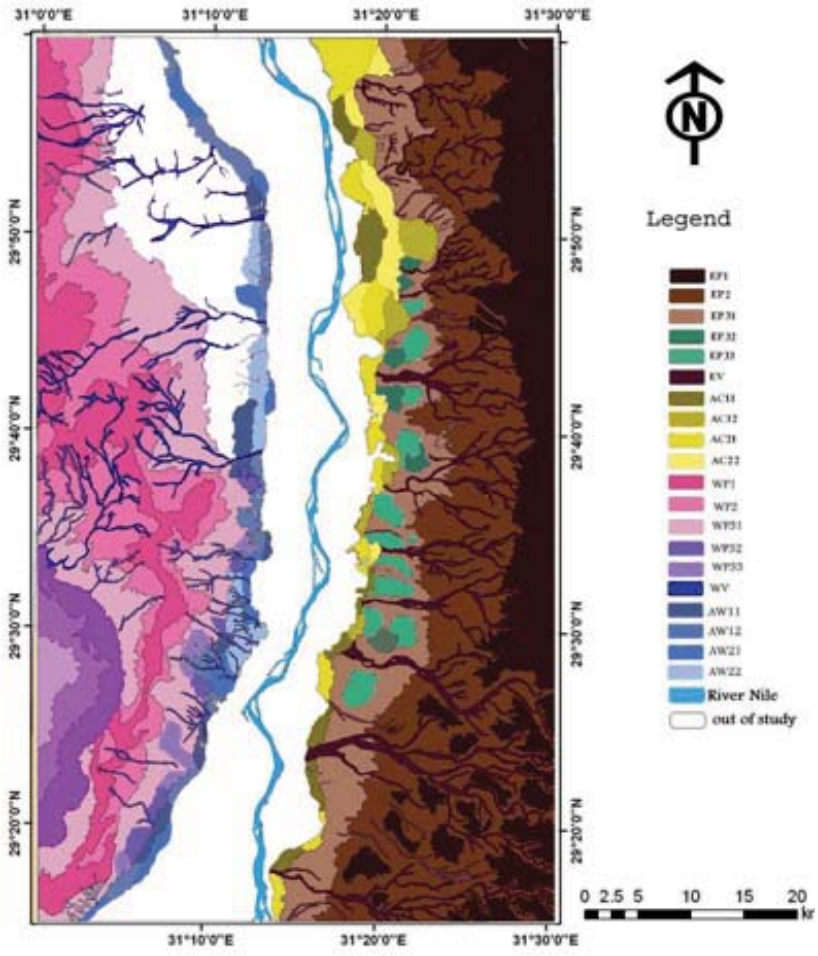

Fig. 2: Physiographic map of the studied area

and increase with depth and ranged between 2.16 and 8.82% the $CaCO_3$ content less than 10% which indicated that there is no calcareous gypsum content is low and ranged between 0.21 and 0.80 %, soil salinity (EC dS/m) values varied from layer to another and less than 4 dS/m in profiles 1, 2, 3, while ranged between 4.28 dS/m in the surface and 10.16 dS/m in the deep layers in profiles 4, 5, and ranged between 2.95 dS/m in the surface 5.37 dS/m in the subsurface and 8.13 dS/m in the layer in profile 6 which could be referred to the locations of profiles 4, 5, 6 are low than the other profiles which causes leaching the salts from the high parties and precipitated in the low parties also make the ground water table increase to reach 75 cm from the surface. Soluble sodium cation is the dominant in soluble cations extract. From table (5) the soil fertility as the micronutrients (NPK) and macronutrients (Fe, Mn, Zn, Cu) in the surface and subsurface layers of the wind born deposits are high than the deficiency level and decrease with depth which could be referred to the management, and added the organic and farm manure.

The Alluvial-Colluvial Deposits:

General Description:

Alluvial-Colluvial soils elevation ranged between 60 and 68 masl and area about 173.07 km2 and 47.17% of the total area. The area representative in table (2) by (AC11, AC21, AC22) and the same maping unites representative by profiles (7, 8, 9, 10, 11, 12, 13, 14) , other analyses showed in tables (3, 4, 5,). From Table (2) clear that the land form and topography ranged between Almost flat and undulating, slop ranged between Nearly level to gently sloping, the land use ranged between cultivated with crops, vegetables, orchards and mixed, the parent material is mixed between the Nile Valley sediments and Eastern Desert sediments, the

Table 3: Soil texture, CEC, cations exchange and ESP of the investigated area

Profile No.	Mapping unit	Depth in cm	Gravels %	Corse sand %	Fine sand %	Silt %	Clay %	Texture class	CEC Cm/kg	Exchangeable cations mq/100g Ca^{++}	Mg^{++}	Na^{+}	K^{+}	ESP %
1	AW11	0-20	0.00	28.24	17.38	10.61	33.77	Sandy clay loam	33.21	22.51	6.21	2.96	1.32	8.91
		20-40	0.00	40.37	20.94	8.76	29.93	Sandy clay loam	29.43	20.22	5.26	2.58	1.08	8.77
		40-55	0.00	56.48	17.31	6.73	19.48	sandy loam	19.16	15.75	2.71	1.89	0.73	9.87
		55-85	0.00	81.62	10.47	2.66	5.25	sandy	5.16	2.54	1.39	0.54	0.61	10.46
		85-120	0.00	88.03	8.12	0.34	3.51	sandy	3.46	1.43	1.01	0.44	0.52	12.75
2	AW12	0-20	0.00	58.16	6.27	13.15	22.42	Sandy clay loam	22.05	14.36	4.42	2.80	1.34	12.69
		20-50	0.00	65.71	11.71	9.92	12.66	Sandy loam	12.45	8.56	2.63	0.81	0.28	6.51
		50-70	0.00	81.42	6.35	7.13	5.10	loamy sand	5.02	4.28	0.65	0.49	0.54	9.76
		70-110	0.00	88.25	5.64	3.37	2.74	sand	2.22	1.21	0.61	0.17	0.21	7.66
3	AW12	0-20	0.00	33.71	17.94	13.52	34.83	Sandy clay loam	34.25	23.81	7.26	1.80	0.83	5.26
		20-70	0.00	48.23	12.37	10.24	29.16	Sandy clay loam	28.67	19.73	5.84	2.05	0.67	7.15
		70-90	0.00	62.74	12.94	8.24	16.08	Sandy loam	15.81	9.46	3.53	1.78	0.81	11.26
		90-130	0.00	85.51	6.88	2.46	5.15	sand	5.06	2.41	1.72	0.59	0.32	11.65
4	AW21	0-20	0.00	22.66	33.11	14.18	30.05	Sandy clay loam	29.55	20.78	5.24	2.10	1.05	7.11
		20-50	0.00	29.24	20.39	16.15	34.22	Sandy clay loam	33.65	21.96	6.88	3.61	0.82	10.73
		50-75	0.00	37.54	17.21	18.67	26.58	Sandy clay loam	26.14	18.46	3.32	3.72	0.41	14.23
5	AW21	0-25	0.00	35.44	24.65	8.82	31.09	Sandy clay loam	30.57	20.49	5.75	2.06	1.79	6.74
		25-45	0.00	38.65	15.07	10.24	36.04	Sandy clay loam	35.44	21.71	7.68	3.51	1.91	9.90
		45-75	0.00	45.03	12.12	15.60	27.25	Sandy clay loam	26.80	17.18	4.16	3.68	1.44	13.73
6	AW22	0-30	0.00	10.65	51.88	14.16	23.31	Sandy clay loam	22.92	14.62	5.26	1.58	1.14	6.89
		30-60	0.00	17.58	38.52	15.98	27.92	Sandy clay loam	27.45	18.66	4.65	2.85	1.04	10.38
		60-100	0.00	21.91	46.13	10.64	21.32	Sandy clay loam	20.96	13.58	3.44	3.06	0.66	14.60
7	AC11	0-30	0.00	9.14	41.11	22.97	26.78	Sandy clay loam	26.33	18.28	4.54	2.04	1.15	7.75
		30-55	0.00	15.24	35.39	25.15	24.22	Sandy clay loam	23.82	16.56	3.86	2.41	0.82	10.12
		55-80	5.18	32.33	27.06	16.05	19.38	Sandy loam	19.06	13.52	2.76	2.08	0.61	10.91
		80-95	10.32	40.20	27.40	10.72	11.36	Sandy loam	11.17	7.09	1.98	1.43	0.47	12.80
8	AC11	0-20	0.00	14.19	36.15	20.53	29.13	Sandy clay loam	28.64	19.81	5.92	1.89	0.82	6.60
		20-50	0.00	22.46	29.39	16.97	31.18	Sandy clay loam	30.66	21.29	5.15	2.94	0.66	9.59
		50-75	2.42	19.09	31.38	18.62	28.49	Sandy clay loam	28.02	19.32	4.58	3.35	0.54	11.96
		75-95	14.61	37.66	30.28	7.32	10.13	Loamy sand	9.96	5.43	2.46	1.45	0.45	14.56
9	AC12	0-25	0.00	20.48	34.60	15.55	29.37	Sandy clay loam	28.88	19.64	5.46	1.92	1.22	6.65
		25-45	0.00	30.30	23.24	12.04	34.42	Sandy clay loam	33.85	23.12	6.62	2.94	0.61	8.69
		45-60	11.36	45.11	22.05	6.37	15.11	Sandy loam	14.86	10.42	2.31	1.33	0.58	8.95
		60-100	15.18	52.28	24.64	2.49	5.41	Sand	5.32	2.86	1.29	0.59	0.54	11.09
10	AC12	0-30	1.14	49.82	28.26	5.43	14.35	Sandy loam	14.11	9.62	2.72	0.92	0.66	6.52
		30-60	5.34	58.60	17.59	9.67	8.80	Loamy sand	8.65	5.74	1.54	0.71	0.51	8.20
		60-80	2.66	47.24	36.08	6.48	7.54	Loamy sand	7.41	5.10	1.04	0.78	0.45	10.52
		80-100	6.36	61.18	24.22	3.10	5.14	sand	5.05	3.09	0.86	0.71	0.34	14.05
11	AC21	0-25	0.00	11.15	48.10	12.52	28.23	Sandy clay loam	27.76	18.15	5.75	1.73	1.79	6.23
		25-60	2.18	15.35	36.14	15.24	31.09	Sandy clay loam	30.57	20.63	5.16	3.32	1.22	10.86
		60-90	2.79	19.67	35.54	14.34	27.66	Sandy clay loam	27.20	15.62	6.34	3.67	1.79	13.49
12	AC21	0-10	0.00	16.33	33.13	20.27	30.27	Sandy clay loam	29.77	20.69	5.26	2.25	1.06	7.56
		15-45	1.25	18.00	23.36	22.12	35.27	Sandy clay loam	34.68	22.16	6.02	4.55	1.28	13.12
		45-85	3.41	22.53	30.85	16.03	27.18	Sandy clay loam	26.73	17.74	4.91	3.21	0.57	12.01
13	AC22	0-25	1.32	1.54	41.66	21.13	34.35	Sandy clay loam	33.78	24.06	6.42	1.47	1.31	4.35
		25-60	2.13	6.45	51.52	13.98	25.92	Sandy clay loam	25.49	17.95	4.46	1.91	0.84	7.49
		60-95	4.66	22.43	50.16	8.70	14.05	sandy loam	13.82	8.54	3.43	1.10	0.56	7.96
		95-130	7.25	32.64	46.48	3.37	10.26	Loamy sand	10.09	5.22	3.27	0.97	0.51	9.61
14	AC22	0-30	1.39	19.43	28.00	17.54	33.64	Sandy clay loam	33.08	22.93	6.38	1.68	1.57	5.08
		30-70	4.75	26.35	27.60	13.27	28.03	Sandy clay loam	27.56	18.78	5.56	2.12	0.64	7.69
		70-120	6.21	37.38	20.46	16.73	19.22	Sandy loam	18.90	13.12	3.97	1.36	0.32	7.20

Table 4: Chemical analysis of the investigated area

Profile. No	maping unit	EC dS/m	Soluble cations mq/L Ca^{++}	Mg^{++}	Na^{+}	K^{+}	Soluble anions mq/L CO_3^{--}	HCO_3^{-}	Cl^{-}	SO_4^{-}	pH (sp)	O.M %	$CaCO_3$ %	gypsum %
1	AW11	1.25	4.55	3.13	3.61	1.21	0.00	2.25	4.85	5.40	7.23	1.84	4.72	0.22
		1.37	4.75	3.81	3.89	1.25	0.00	3.01	5.23	5.46	7.44	0.90	16.18	0.61
		1.51	6.22	2.37	5.20	1.31	0.00	3.99	7.22	3.89	7.63	0.61	3.75	0.24
		2.52	8.20	3.66	10.79	2.55	0.00	4.02	13.02	8.16	7.71	0.30	4.26	0.32
		2.67	7.98	5.41	10.95	2.36	0.00	4.12	13.95	8.63	7.78	0.27	4.67	0.80
2	AW12	1.21	4.31	2.93	3.63	1.23	0.00	3.02	4.98	4.10	7.33	1.67	3.87	0.34
		2.48	7.23	4.12	11.20	2.25	0.00	3.25	12.98	8.57	7.38	0.72	5.56	0.41
		2.61	8.23	4.52	10.98	2.37	0.00	3.78	12.21	10.11	7.51	0.35	8.53	0.65
		3.15	10.05	5.80	12.99	2.66	0.00	4.22	13.98	13.30	7.57	0.26	8.82	0.66

Table 4: Continued

3	AW12	1.33	4.65	3.51	3.79	1.35	0.00	2.20	5.45	5.65	7.35	1.61	2.16	0.20
		1.46	5.02	3.32	4.25	2.01	0.00	3.21	5.02	6.37	7.42	0.55	3.42	0.27
		1.86	5.79	3.99	6.15	2.67	0.00	3.31	9.23	6.05	7.48	0.36	6.18	0.45
		3.18	10.99	5.23	13.02	2.56	0.00	5.66	15.00	11.14	7.57	0.27	6.29	0.56
4	AW21	4.81	10.23	9.09	25.99	2.79	0.00	7.23	29.71	11.16	7.31	1.62	2.63	0.38
		8.18	28.12	14.91	35.88	2.89	0.00	8.99	40.23	32.58	7.77	0.83	4.81	0.52
		11.64	25.02	20.00	60.72	10.66	0.00	10.35	65.75	40.30	7.83	0.55	5.44	0.61
5	AW21	4.28	10.20	7.06	23.29	2.25	0.00	2.75	26.31	13.74	7.36	1.43	3.38	0.21
		7.58	18.98	15.89	36.15	4.75	0.00	10.21	39.75	25.84	7.94	0.63	4.66	0.49
		10.16	20.00	15.40	55.95	10.25	0.00	10.95	60.02	30.63	7.93	0.32	4.23	0.63
6	AW22	2.96	9.62	5.23	12.08	2.67	0.00	3.56	15.12	10.92	7.28	1.87	3.81	0.24
		5.37	16.89	10.87	20.99	4.95	0.00	10.23	23.02	20.45	7.55	0.90	6.96	0.32
		8.13	21.15	16.95	34.35	8.85	0.00	10.98	35.75	34.57	7.81	0.31	8.28	0.61
7	AC11	2.11	7.02	4.75	6.78	2.55	0.00	3.02	10.02	8.06	7.22	1.41	7.64	0.60
		2.91	8.27	6.65	12.18	2.00	0.00	3.67	15.21	10.22	7.34	0.65	11.82	0.94
		4.57	10.20	8.06	25.29	2.15	0.00	4.75	27.32	13.63	7.56	0.42	16.11	1.38
		6.73	14.35	12.97	32.25	4.75	0.00	10.85	35.01	21.44	7.68	0.31	20.43	2.44
8	AC11	2.71	9.12	5.53	10.25	2.20	0.00	3.02	14.25	9.83	7.11	1.53	8.82	0.77
		3.82	11.13	9.09	15.78	2.20	0.00	4.96	17.36	15.88	7.26	0.62	10.18	1.24
		4.11	12.56	8.16	17.23	3.15	0.00	5.02	19.67	16.41	7.65	0.31	15.13	1.52
		4.83	11.02	10.32	23.21	3.75	0.00	6.02	25.85	16.45	7.74	0.17	14.75	1.86
9	AC12	1.44	4.05	2.99	4.95	2.41	0.00	2.65	6.99	4.76	7.17	1.52	6.28	0.82
		2.65	7.12	5.53	10.25	3.60	0.00	3.02	12.50	10.98	7.21	0.66	9.18	1.37
		5.28	13.05	12.75	23.25	3.75	0.00	6.75	25.67	20.38	7.26	0.35	15.20	1.14
		6.70	18.30	13.20	30.25	5.25	0.00	10.25	33.21	23.57	7.27	0.21	13.73	2.30
10	AC12	1.61	4.21	3.13	6.20	2.56	0.00	2.21	8.36	5.53	7.21	1.14	7.12	0.78
		2.27	6.42	4.51	8.02	3.75	0.00	2.36	10.12	10.22	7.58	0.72	9.62	1.07
		3.48	10.25	9.52	12.78	2.25	0.00	6.02	14.65	14.13	7.71	0.40	16.52	1.32
		5.11	15.32	13.20	18.83	3.75	0.00	6.72	23.95	20.43	7.73	0.12	19.95	1.66
11	AC21	3.75	10.12	8.15	15.56	3.67	0.00	4.55	17.95	15.00	7.31	1.62	7.25	0.88
		6.14	16.40	14.40	26.25	4.35	0.00	10.55	30.10	20.75	7.72	0.81	11.72	1.16
		8.55	22.45	21.34	35.02	6.69	0.00	13.67	39.85	31.98	7.93	0.63	17.11	2.06
12	AC21	2.42	7.12	5.22	8.56	3.30	0.00	4.15	10.69	9.36	7.21	1.69	8.28	0.54
		5.67	14.35	12.44	25.02	4.89	0.00	7.53	28.75	20.45	7.28	0.82	13.94	0.81
		9.51	25.31	20.94	45.29	5.56	0.00	10.79	48.56	35.75	7.44	0.71	20.28	1.33
13	AC22	1.87	4.65	2.14	6.35	2.56	0.00	3.51	8.78	6.41	7.26	1.62	8.71	0.97
		2.14	6.30	5.13	6.98	2.99	0.00	4.62	8.99	7.79	7.34	0.92	15.10	1.34
		2.90	10.99	8.17	6.99	2.85	0.00	5.02	12.95	11.03	7.38	0.67	14.37	1.56
		4.18	12.12	7.12	18.31	2.25	0.00	4.22	20.45	17.13	7.41	0.31	21.84	1.94
14	AC22	2.20	6.71	5.62	6.70	2.75	0.00	4.23	8.98	8.79	7.32	1.57	6.14	1.31
		2.36	6.79	4.85	6.20	2.66	0.00	3.75	10.75	9.10	7.65	0.78	18.63	2.15
		3.18	9.15	9.21	10.57	2.23	0.00	5.01	12.85	13.94	7.73	0.41	17.17	2.47

drainage ranged between well in the high parts and moderate in the low parts, the ground water table depth ranged between 85 cm in the low parts and 130 cm in the high parties, the surface irrigation is the dominant in the area, and the New formation ranged between soft concretion and hard nodules of $CaCO_3$ and gypsum.

From the same table the description of the profile layers reveal that the colour is dark in the surface and subsurface layers and changed to light in the deep layers, the texture changed from fine in the surface and subsurface layers to coarse in the deep layers, soil structure is blocky in the surface and subsurface layers and changed to single grains in the deep layers, consistence changed from hard in the surface to loose in the deep layers, the effervescence ranged between very high in the surface to strong in the deep layers according to the parent material of the Eastern Desert, the boundary ranged between clear smooth, Gradually and diffuse and the New formation ranged between soft concretion and hard nodules of $CaCO_3$ and gypsum.

From table (3) clear that the texture is sandy clay loam in profiles 11, 12, in the low parts, while is sandy clay loam in the surface and subsurface, sandy loam in the third layer and sand in the deep layers in profiles 7, 9, 13, 14, also ranged between sandy clay loam in the surface, subsurface and third layers and loamy sand in the deep layer in profile 8, and ranged between sandy loam in the surface, loamy sand in the subsurface and sand in the deep layer in profile 10, cations exchange capacity (CEC mq/100 g soil) varied from layer to another according to the variation in the texture which is ranged between 34.68 mq/100 g soil in sandy clay loam and 5.05 mq/100 g soil in sand. From table (4) clear that the pH values ranged between 7.11 and 7.93, O.M content is low and ranged between 1.69 % in the surface layers and decrease with depth to 0.17 %, $CaCO_3$ content is less than 10 % in the surface layer and increase with depth to 21.84 % in the deep layer. From the $CaCO_3$ content clear that the have calcareous. Soil salinity (EC dS/m) is less than 4 dS/m in profiles

Table 5: Fertility analyses of the investigated area

Profile No.	mapping unit	Depth in cm	Micronutrants (ppm) Avilable Fe	Mn	Zn	Cu	Micronutrants (ppm) Avilable N	P	K
1	AW11	0-20	5.02	2.31	0.60	0.17	920.00	20.35	247.19
		20-40	3.27	2.97	0.34	0.16	450.00	16.60	148.75
		40-55	2.45	1.56	0.32	0.15	300.00	5.78	150.09
		55-85	1.83	1.14	0.22	0.12	150.00	5.21	138.45
		85-120	1.65	1.65	0.15	0.10	130.00	2.30	131.04
2	AW12	0-20	6.46	3.57	0.35	0.15	830.00	18.78	347.97
		25-50	4.60	2.46	0.23	0.13	360.00	12.26	226.79
		50-70	2.93	1.08	0.13	0.11	170.00	8.35	160.43
		70-110	1.31	0.78	0.12	0.05	130.00	5.20	155.74
3	AW12	0-20	6.16	2.22	0.43	0.16	800.50	18.98	299.65
		20-70	4.72	1.44	0.51	0.12	270.00	8.97	178.39
		70-90	3.24	0.79	0.30	0.11	180.00	6.45	130.13
		90-130	1.24	0.83	0.17	0.06	130.50	3.20	116.84
4	AW21	0-20	5.54	2.28	0.64	0.19	810.00	20.77	364.81
		20-50	4.40	1.38	0.60	0.16	410.00	17.21	224.71
		50-75	2.72	0.68	0.17	0.14	270.00	6.22	150.74
5	AW21	0-25	6.18	2.22	0.76	0.16	710.50	16.88	304.75
		25-45	4.85	1.56	0.55	0.15	310.00	10.31	219.25
		45-75	1.26	0.83	0.54	0.13	160.00	4.65	177.75
6	AW22	0-30	6.23	2.02	0.60	0.13	930.00	20.61	221.13
		30-60	4.87	1.75	0.50	0.12	450.00	10.25	189.05
		60-100	1.15	0.12	0.20	0.11	150.00	4.89	170.15
7	AC11	0-30	4.98	1.98	0.41	0.14	700.00	17.38	299.45
		30-55	3.15	1.82	0.40	0.12	320.00	6.26	200.85
		55-80	2.25	1.62	0.30	0.11	210.00	5.98	175.21
		80-95	1.60	0.75	0.30	0.05	150.00	3.75	163.25
8	AC11	0-20	5.67	2.30	0.75	0.15	760.00	20.12	363.80
		20-50	3.98	2.52	0.48	0.12	310.00	13.32	250.80
		50-75	2.02	1.02	0.38	0.11	150.00	6.51	220.85
		75-95	1.32	0.45	0.35	0.05	80.50	4.00	199.26
9	AC12	0-25	4.03	2.02	0.62	0.15	760.00	18.72	325.99
		25-45	2.52	2.22	0.60	0.14	330.00	10.33	260.40
		45-60	1.01	2.46	0.50	0.12	170.00	5.60	198.25
		60-100	0.82	1.62	0.49	0.11	100.50	2.35	135.78
10	AC12	0-30	4.25	2.19	0.59	0.15	570.00	19.56	310.84
		30-60	3.53	2.03	0.42	0.13	360.00	8.31	246.25
		60-80	1.75	1.12	0.38	0.12	200.00	4.22	230.75
		80-100	0.82	0.75	0.36	0.05	60.00	2.56	189.25
11	AC21	0-25	3.78	2.21	0.39	0.16	810.00	20.17	325.65
		25-60	2.25	2.67	0.35	0.13	400.00	10.38	289.66
		60-90	0.91	1.12	0.31	0.12	310.50	6.75	198.78
12	AC21	0-15	4.6	3.22	0.53	0.15	840.50	18.55	328.70
		15-45	3.95	1.78	0.42	0.13	410.00	10.30	207.71
		45-85	1.12	1.12	0.40	0.12	350.50	5.00	167.84
13	AC22	0-25	5.12	4.12	0.41	0.19	810.00	20.71	299.84
		25-60	3.32	1.56	0.38	0.13	460.00	10.22	216.61
		60-95	1.46	1.12	0.31	0.12	330.50	6.11	197.21
		95-130	1.12	0.65	0.18	0.11	150.50	3.00	140.25
14	AC22	0-30	5.31	3.25	0.51	0.15	780.50	13.56	300.25
		30-70	3.62	1.25	0.50	0.14	390.00	6.98	203.74
		70-120	1.02	0.85	0.30	0.11	200.50	3.56	178.97

profile 14, in surface, subsurface layers in profiles 7, 8, 9, in surface, subsurface, third layer in profile 10, 13, while in the surface in profile 12. From the salinity data clear that profiles 11, 12 which located in the low parties the salinity effect extend to the subsurface layer while the other profiles salinity effect only in the deep layer. Soluble sodium cation is the dominant in the soluble cation extract. From table (5) the soil fertility as the macronutrients (NPK) and micronutrients (Fe, Mn, Zn, Cu) in the surface and sub surface layers of the alluvial colluvial deposits are high than the deficiency level and decrease with depth which could be referred to the management, and added the organic and farm manure.

Soil Taxonomy:

Based on soil taxonomy of USA (2006) the soil of Alluvial wind born deposits could be classified as typic Torrifluvents, while in the Alluvial colluvial soils calassified as Typic calciorthids in profiles 7, 8, 9, 10, 13, 14, and Typic Torrifluvents in profiles 11, 12.

Table 6: Land suitability for selected crops according to Micro LIES model

Profile No.	Mapping unit	Wheat	Corn	Melon	Potato	Cotton	Sun flower	Alfalfa	Citrus	Olive	Soybean	Sugar beat	Peach
1	AW11	S_2K, ESP	S_2 ESP	S_2 dr, ESP	S_2 dr, ESP	S_2 dr.	S_2 K	S_2 dr, ESP	S_2 dr, ESP	S_2 dr, K, ESP	S_2 te, K, ESP	S_2 te, K	S_2 ESP
2	AW12	S_2t, K, ESP	S_2 te, ESP	S_2 EC, ESP	S_2 EC, ESP	S_1	S_2, dr, K, EC, ESP	S_2, EC, ESP	S_2, EC, ESP	S_2, K, EC, ESP	S_2, te, K, ESP	S_2, te, K	S_2, ESP
3	AW12	S_2K, ESP	S_2 ESP	S_2 dr, ESP	S_2 dr, ESP	S_2 dr	S_2 K, ESP	S_2 dr, te, ESP	S_2 dr, te, ESP	S_2 dr, te, K, ESP	S_2 te, K, ESP	S_2 te, K	S_2 ESP
4	AW21	S_2dr, t, K, EC, ESP	S_2dr, t, EC, ESP	S_2 te, EC, ESP	S_2 te, EC, ESP	S_2 te, EC	S_2 dr, te, K, EC, ESP	S_2 dr, te, K, EC, ESP	S_2 de, te, EC, ESP	S_2 de, te, EC, K, ESP	S_2 te, K, EC, ESP	S_2 te, K, EC,	S_2 dr, EC, ESP
5	AW22	S_2dr, te, K, EC, ESP	S_2dr, te, EC, ESP	S_2 te, EC, ESP	S_2 te, EC, ESP	S_2 te, EC	S_2 dr, te, K, EC, ESP	S_2 dr, te, K, EC, ESP	S_2 de, te, EC, ESP	S_2 de, te, K, EC, ESP	S_2 te, K, EC, ESP	S_2 te, K, EC	S_2 EC, ESP
6	AW22	S_2, te, K, EC, ESP	S_2 dr, EC, ESP	S_2 EC, ESP	S_2 EC, ESP	S_1, K	S_2 dr, K, EC, ESP	S_2 dr, K, EC,ESP	S_2 te, EC,ESP	S_2 te, K, EC,ESP	S_2 te, K, EC,ESP	S_2 te, K, EC	S_2 dr, ESP
7	AC11	S_2 t, K, EC, ESP	S_2dr, K, EC, ESP	S_2 K, EC, ESP	S_2 K, EC, ESP	S_2 K	S_2 dr, EC,ESP	S_2 dr, EC,ESP	S_2 te, EC,ESP	S_2 te, EC,ESP	S_2 dr, ESP	S_2 te	S_2 dr, ESP
8	AC11	S_2 te, ESP	S_2dr, K, ESP	S_2 K, EC, ESP	S_2 K, EC, ESP	S_2 K	S_2 dr, EC,ESP	S_2 dr, EC,ESP	S_2 te, K, EC,ESP	S_2 te, EC,ESP	S_2 dr, ESP	S_2 te	S_2 dr, K, EC, ESP
9	AC12	S_2 te, EC, ESP	S_2dr, K, EC, ESP	S_2 K, EC, ESP	S_2 K, EC, ESP	S_2 K	S_2 dr, EC, ESP	S_2 dr, EC, ESP	S_2 K, EC, ESP	S_2 EC, ESP	S_2 t, EC, ESP	S_2 te, EC	S_2 dr, K, EC, ESP
10	AC12	S_2 te, ESP	S_2dr, K, ESP	S_2 K, EC, ESP	S_2 K, EC, ESP	S_2 K	S_2 dr, EC,ESP	S_2 dr, EC,ESP	S_2 te, K, EC, ESP	S_2 te, EC, ESP	S_2 te, EC, ESP	S_2 te, EC	S_3 t, dr, K, EC, ESP
11	AC21	S_2 dr, EC, ESP	S_2te K, EC, ESP	S_2 dr, K, EC, ESP	S_2 dr, K, EC, ESP	S_2 dr, te, K, EC	S_2 te, EC,ESP	S_2 te, EC, ESP	S_2 de, dr, te, K, EC, ESP	S_2 de, dr, te, EC, ESP	S_2 EC, ESP	S_1	S_2 t, dr, K, EC, ESP
12	AC21	S_2 EC, ESP	S_2 K, EC, ESP	S_2 K, EC, ESP	S_2 K, EC, ESP	S_2 dr, K	S_2 EC, ESP	S_2 EC, ESP	S_2 de, dr, K, EC,ESP	S_2 de, dr, EC,ESP	S_2 EC, ESP	S_1	S_2 t, dr, K, EC, ESP
13	AC22	S_2 te, EC	S_2 dr, K, ESP	S_2 dr, K, EC, ESP	S_2 dr, K, EC, ESP	S_2, K	S_2 dr, EC, ESP	S_2 dr, EC,ESP	S_2 K, EC, ESP	S_2 EC, ESP	S_2 ESP	S_1	S_2 te, K, ESP
14	AC22	S_2 ESP.	S_2 K, ESP	S_2 dr, K, EC, ESP	S_2 dr, K, EC, ESP	S_2 dr, K	S_2 EC, ESP	S_2 EC, ESP	S_2 dr, K, EC, ESP	S_2 dr, EC, ESP	S_2 ESP	S_1	S_2 te, K, ESP

Table 7: Land suitability for selected crops according to Sys et. Al. (1990)

Profile No.	Mapping unit	Wheat	Corn	Melon	Potato	Cotton	Sun flower	Alfalfa	Citrus	Olive	Soybean	Sugar beat	Peach
1	AW11	S_3 te, OM	S_3 OM	S_3 OM	S_3 OM	S_3 te, OM	S_3 OM	S_3 OM	S_3 de, K, OM, ESP	S_3 OM	S_2 te, K, ESP, OM	S_2 te, K	S_2 ESP, OM
2	AW12	S_3 t, te, CEC, OM	S_3 t, te, CEC, OM	S_3 t, CEC, OM	S_3 t, CEC, OM	S_3 t, te, CEC, OM	S_3 t, te, CEC, OM	S_3 t, te, CEC, OM	S_3 t, de, te, K, CEC, OM	S_3 t, te, CEC, OM	S_3 te, K, CEC, ESP, OM,	S_2 te, K CEC,	S_2, ESP, CEC, OM
3	AW12	S_3 te, OM	S_3 OM	S_3 OM	S_3 OM	S_3 te, OM	S_3 OM	S_3 OM	S_3 de, OM, ESP	S_3 OM	S_2 te, K,	S_2 te, K ESP	S_2 ESP, OM
4	AW21	S_4 dr, te, OM, EC	S_3 dr, OM, EC	S_4 de, OM, EC	S_4 dr, te, OM, EC	S_3 dr, te, OM	S_3 de, dr, OM, EC	S_3 dr, OM, EC	S_4 de, dr, OM, EC, ESP	S_4 de, dr, OM	S_3 te, K, EC, ESP, OM	S_4 te, K, EC,	S_4 dr, EC, ESP, OM
5	AW22	S_3dr, te, OM, EC	S_3 dr, OM	S_3 de, OM, EC	S_4 dr, OM, EC	S_2 dr, te, OM	S_3 de, dr, OM, EC	S_3 dr, OM, EC	S_3 de, dr, OM, EC, ESP	S_4 de, dr, OM	S_3 te, K, EC, ESP, OM	S_2 te, K, EC, OM	S_4 EC, ESP, OM
6	AW22	S_2, te, OM, EC,	S_3, OM	S_3, OM, EC	S_3, OM, EC	S_3, te, OM	S_3 OM, EC	S_3, OM, EC ESP	S_3, de, K, OM, EC,	S_3, de, OM	S_3 te, K, EC,ESP	S_2 te, K, EC, OM	S_2 dr, ESP
7	AC11	S_3 dr, te, OM, EC	S_3 te, OM	S_3 de, OM, EC	S_3 dr, K, OM, EC	S_3 dr, te, OM	S_3 de, dr, te, OM, EC	S_3 dr, te, OM,	S_3 de, dr, te, K, OM, EC	S_3 de, dr, te, OM	S_2 dr, ESP, OM	S_2 te, OM	S_2 dr, ESP, OM
8	AC11	S_3 dr, te, OM, EC	S_3 OM,	S_3 de, OM, EC	S_3 dr, K, OM, EC	S_3 dr, te, OM	S_3 de, dr, OM	S_3 dr, OM,	S_3 de, dr, K, OM, EC, ESP	S_3 de, dr, OM	S_2 dr, ESP, OM	S_2 te, OM	S_2 dr, K, EC, ESP
9	AC12	S_3 te, OM, EC	S_3 OM	S_3 OM, EC	S_3 t, K, OM, EC	S_3 te, OM	S_3 OM, EC	S_3 OM	S_3 de, K, OM, EC, ESP	S_3 de, OM	S_2 t, EC, ESP	S_2 te, EC, OM	S_2 dr, K, EC, ESP
10	AC12	S_3 t, te, CEC, OM, EC	S_3 t, te, CEC, OM	S_3 t, CEC, OM	S_3 dr, K, CEC, OM	S_3 t, te, CEC, OM	S_3 t, te, CEC, OM, EC	S_3 t, te, CEC, OM	S_3 t, de, te, K, CEC, OM	S_3 t, de, te, CEC, OM	S_2 te, EC, ESP, OM	S_2 te, EC, OM	S_3 t, dr, K, EC, ESP
11	AC21	S_4 dr, te, CEC, OM, EC	S_3 CEC, OM	S_3 de, OM, EC, CEC	S_4 dr, K, CEC, OM, EC	S_3 dr, te, CEC, OM	S_3 de, dr, CEC, OM, EC	S_3 dr, CEC, OM, EC	S_4 de, dr, K, CEC, OM, EC, ESP	S_3 de, dr, CEC, OM	S_2 EC, ESP, OM	S_3 dr, te, OM	S_3 t, dr, K, EC, ESP, OM
12	AC21	S_3 dr, te, OM, EC	S_2 OM	S_2 OM, de, EC	S_3 dr, K, OM, EC	S_2 dr, te, OM	S_2 de, dr, OM, EC	S_2 dr, OM, EC	S_3 de, dr, K, OM, EC, ESP	S_3 de, dr, OM	S_2 EC, ESP, OM	S_3 dr, te, OM, EC	S_3 t, dr, K, EC, ESP
13	AC22	S_3 dr, te, OM	S_3 dr, te, OM	S_3 OM	S_3 dr, K, OM	S_3 dr, te, OM	S_3 dr, te, OM	S_3 dr, te, OM	S_3 de, dr, te, K, OM	S_4, dr, te, OM	S_2 ESP, OM	S_3 dr, te, OM	S_2 te, K, ESP, OM
14	AC22	S_3 dr, te, OM	S_3 dr, OM	S_3 OM	S_3 dr, K, OM	S_3 dr, te, OM	S_3 dr, OM	S_3 dr, OM	S_3 de, dr, K, OM	S_4 dr, OM,	S_2 ESP, OM	S_3 dr, te, OM	S_2 te, K, ESP, OM

Land Suitability:

The soils of the investigated area based on the Micro LIES model (Table 6) could be classified as wheat, corn, melon, potato, sun flower, citrus, olive, and peach ranged between high and marginal, while alfalfa, and soybean ranged between high and moderate. The cotton and sugar beat ranged between optimum and moderate. On the other hand based on Sys model (Table 7) wheat, potato, citrus, olive, soybean, and peach ranged between moderate and marginal, while corn, cotton, sugar beat ranged between high and moderate, melon ranged between high and marginal and sunflower and alfalfa are moderate. From the previous clear that the models are differenced in their classes of suitability of the soils for the same crops which chose to cultivated in the reclaimed soils and the difference could be referred to that the Micro LIES model depend on the soil properties as soil profile depth, Drainage, texture, $CaCO_3$ content, salts content, Exchangeable sodium percentage and soil profile development, while the Sys model depend on the previous mentioned properties before and added the soil topography, coarse fragment, gypsum, cation exchange capacity, and organic matter.

The Micro LIES depend on the soil is virgin and does' not cultivated butte the Sys model depend on the soils cultivated for long time. The soils under investigation are cultivated for long time for this reason Sys model is acceptable to apply than the MicroLIES model.

Conclusion:

The area under investigation in Giza governorate (interference zone) bounded by latitudes 29° 15` and 30° 00` north and longitudes 31° 00` and 31° 20`east which representative by forten soil profile, based on the morphological description, physical and chemical analyses the soils classified as Typic Torrifluvents in the western interference zone soils and Typic Calciorthids in the Eastern interference zone soils.

Based on the Micro LIES model the soils ranged between high and marginal suitable for wheat, corn, melon, potato, sun flower, citrus, olive, and peach, while it is ranged between high and moderate for alfalfa, soybean and ranged between optimum and moderate for cotton and sugar beat while using Sys model classified the soils ranged between moderate and marginal suitable for wheat, potato, citrus, olive, soybean, and peach, high and moderate suitable for corn cotton, sugar beat, high and marginal suitable for melon, moderate suitable for alfalfa.

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