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بسم اللّه الرحمن الرحيم

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بالرسالة صفحات

لم ترد بالأصل

SALWA AKL

CONTRIBUTION OF GEOGRAPHIC INFORMATION SYSTEMS FOR STUDYING SOME ENVIRONMENTAL PROBLEMS IN EL FAYOUM GOVERNORATE, EGYPT

BY

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THESIS OF

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Abstract

The present work aimed to investigate the contribution of GIS for studying the environmental impacts of both using mixed irrigation water and the vehicles on soil pollution. To achieve this target, different localities affected by mixed irrigation water and traffic pollution were selected at Tamia and Sinnuris Districts.

Aerial photo-interpretation followed by conventional field check and laboratory analyses were integrated with the GIS to provide a suitable base map.

The main physical and chemical results of the different mapping units were stored into ILWIS 3.1 GIS in a relational data-base format.

The effect of using mixed irrigation water on soil pollution :

The results of the chemical analysis of the different water sources used to irrigate the studied area showed an obvious increase of the micro elements and heavy metals concentration in the mixed water as compared to the fresh water .

Data of the impact of using mixed irrigation water on soil salinity and pollution reflected the hazard effects on soil properties, where remarkable increases in soil salinity, micro elements and heavy metals in all the studied soils irrigated with mixed water were occurred.

The assessment of traffic pollution on the adjacent soils:

The effect of automobile exhausts on soil pollution with Pb and Cd was tested in three sample areas. The roads network were overlayed first over the soil-map of Sinnuris Districts. to specify the soil mapping units that have roads with different construction ages and with different types of side tree as wind barriers. The selected mapping unit of PI 1211 (<0.5% clayey),Nile alluvial clayey soils is slightly saline, non alkaline, with

high CEC, with relatively high organic mater content and classified as Typic Haplotorrerts

Three sample areas were taken surrounding 3 roads, each of them has 3 sampling tracks. Five mini-pits were sampled in each track at distances of 10 , 20 ,50 ,100 and 200 m east of the roadside. All soil samples were tested for total and available Pb and Cd. Data revealed that the effect of automobile exhausts on soil pollution with Pb and Cd was very recognizable.

The total and available contents of both Pb and Cd were relatively high in the top soil than the subsurface in all the observed samples.

The data indicated a highly negative correlation between the distance from the road and both Pb and Cd contents in the surface and subsurface soil samples

A correlation model, calculated between the total Pb and Cd contents and distance east of the tested roads, was created using total number of 9611 interpolated points, and the results indicate the following equations.

Location 1- new El-Fayoum – Cairo highway (without side roads trees).

1- Total Pb (ppm) = -0.0631X + 20.881 r= (-0.992)

2-Total Cd (ppm) = -0.007X + 2.3327 r= (-0.98)

Location 2- old road of El-Fayoum - Cairo (with wind break).

1-Total Pb (ppm) = -0.082X + 30.646 r= (-0.98)

2- Total Cd (ppm) = -0.013X + 3.9359 r = (-0.985)

Location 3- old road of El-Fayoum – Cairo (without side road trees).

1- Total Pb (ppm) = -0.076X + 36.537 r = (-0.987)

2- Total Cd (ppm) = -0.0121X + 5.845 r = (-0.989)

Where: X= distance (m) east of the roads up to 300 m.

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