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مركز البحث النووي بالجزائر
Centre de Recherche Nucléaire d'Alger

XIV. International Conference on Nuclear Structure Properties,
NSP2021 2-4 June 2021,
Selcuk University, Konya, Turkey

Spatial distribution of Major, Minor and trace element in semi-arid land of western Algeria

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Outline

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Introduction

Soil Is A Key Natural Resource Which Supports Life And Is A **Major Prerequisite For Sustainable Development In Terrestrial Environments**.

Characterization

Establish quality

1. **Bioavailability**
2. **pollution,**
3. **nutrient deficiencies Or excesses**

predict **impacts on food chains and geo-eco-systems**

Both deficiencies Or excesses

Scope

The aim of this work is the determination of the geochemical baseline values of major, minor and trace elements in agriculture soil with an emphasis on geology, anthropogenic inputs and other physico-chemical properties

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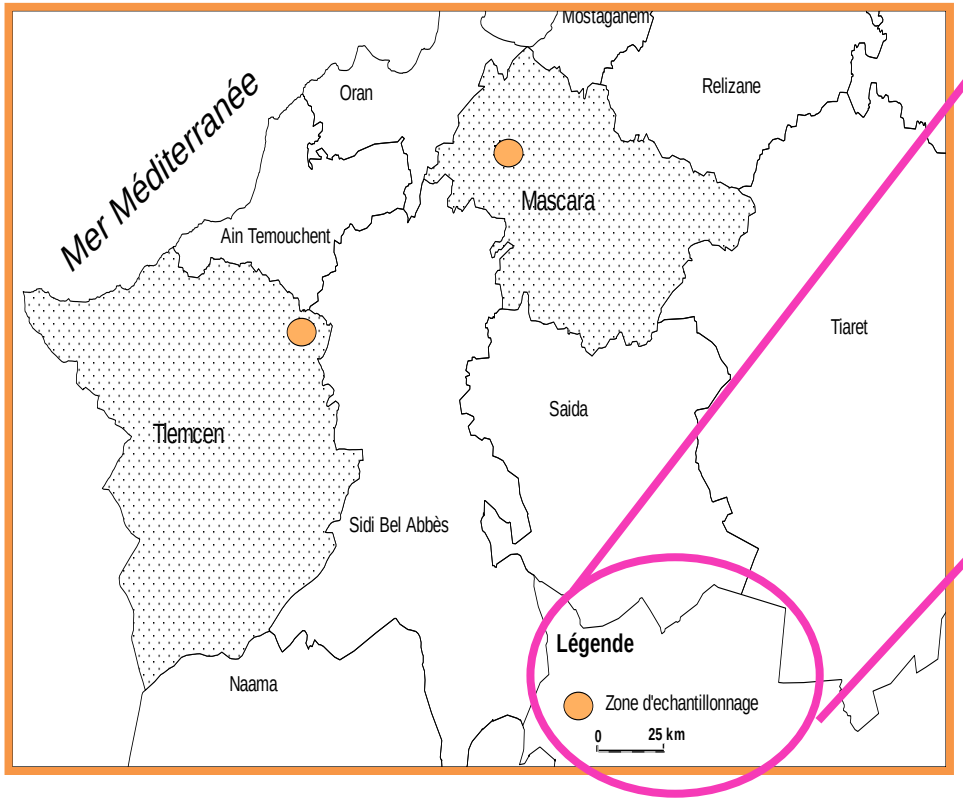
Assesse the ecological risk

Material & Method

Study Area

Agriculture soil in small watershed located approximately 40 km east of the city of Tlemcen in the North-West of Algeria.



A total of **25 soil samples** were collected manually at 04 points to depths 0–5, 5–10, 10–15, 15–20, 20–25 and 25–30 cm

Approach

Sample preparation

Samples were dried at 105°C during 24 hours

grinded & sieved < 2 mm

Pressurized under 18 tons

To obtain homogeneous pallets

Approach

Analysis

ED-XRF Equipment

ORTEC type Si (Li) semiconductor detector with an energy resolution of 165eV at 5.9 keV line.

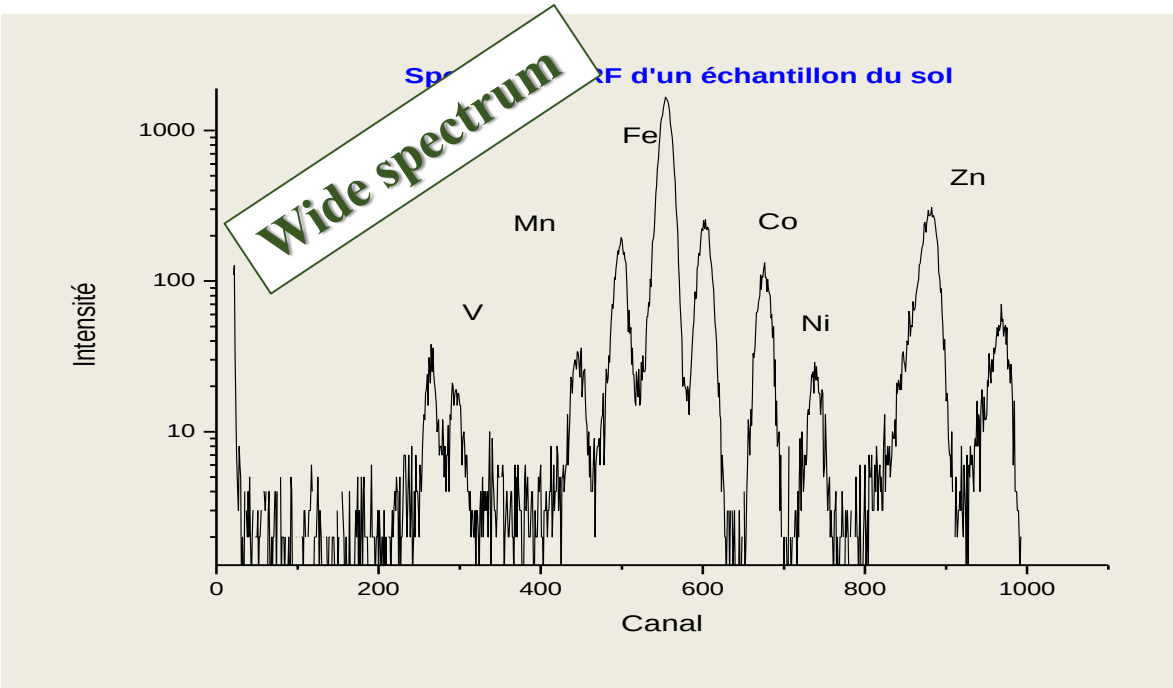
WD-XRF Equipment

Magix Pro type X-ray fluorescence spectrometer (Panalytical ex. Philips)

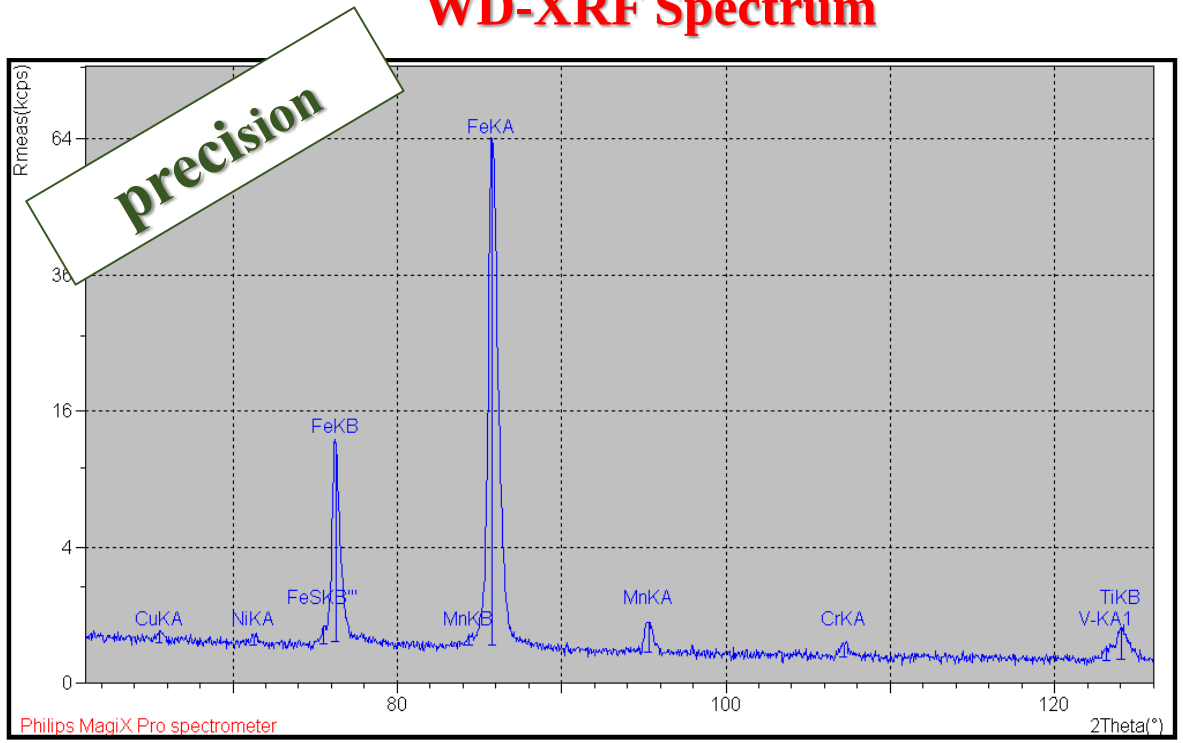
Results & Discussion

Qualitative Analysis

ED-XRF Spectrum



WD-XRF Spectrum



The two techniques were combined in our work to obtain low detection limit for trace element in soil

More 23 minor major and trace element were detected.

Results & Discussion

Quantitative Analysis

The quantification of these elements required the use of reference standards Soil -7 provided by IAEA (International Atomic Energy Agency).

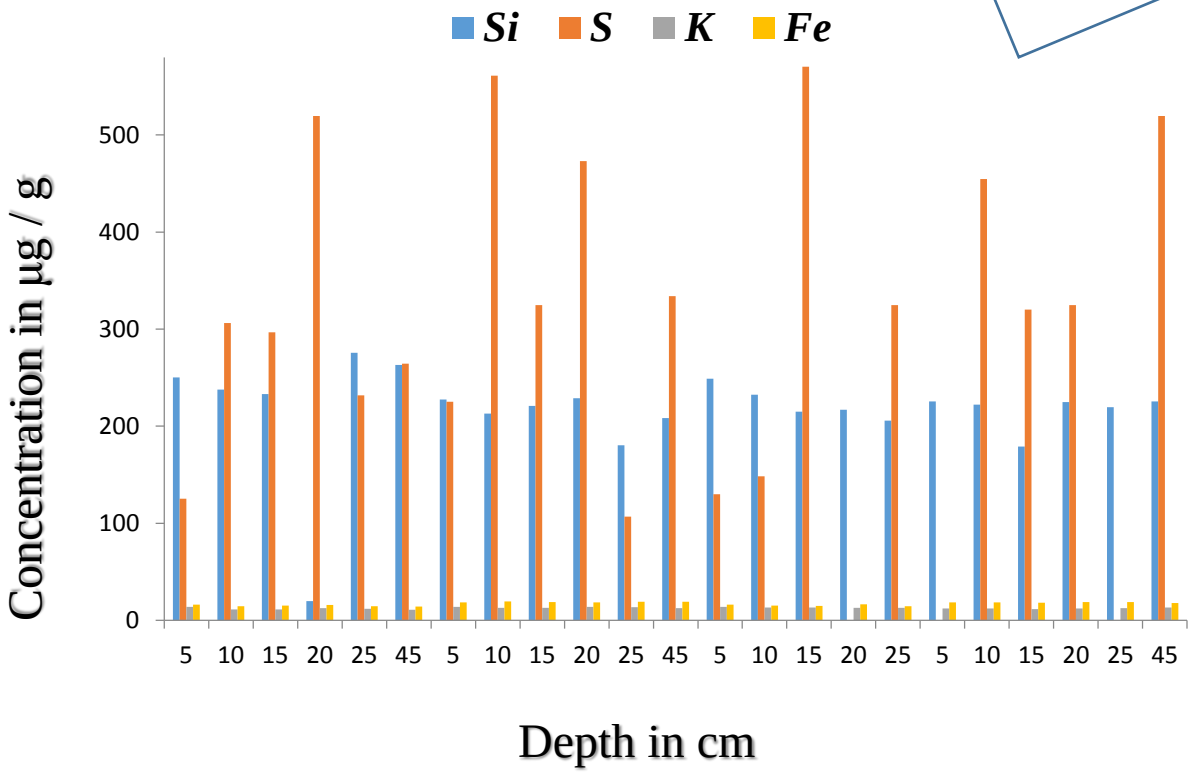
The Concentration was calculated using external standards according :

$$\frac{I_x}{I_{st}} = \frac{C_x}{C_{st}}$$

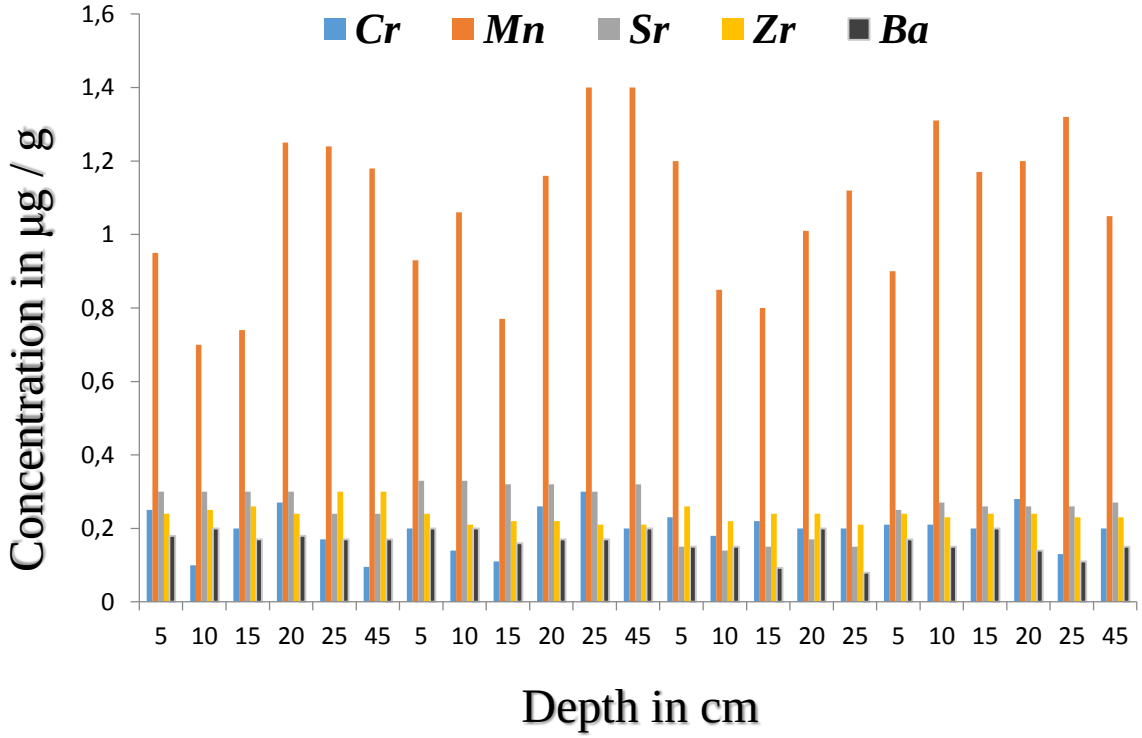
Results & Discussion

major elements

Uniform



minor elements



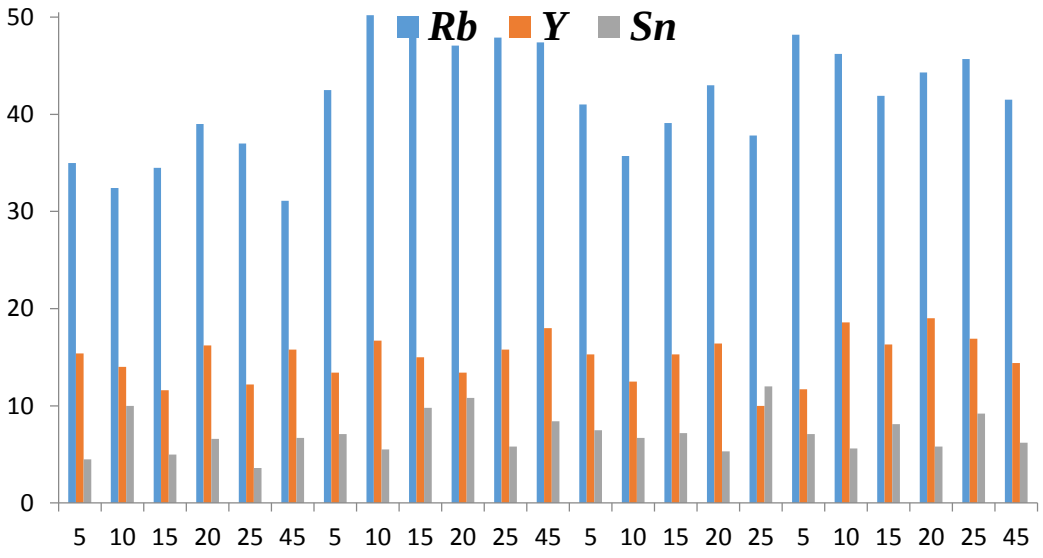
these elements represent the natural composition of soil.

NO sources of pollution detected

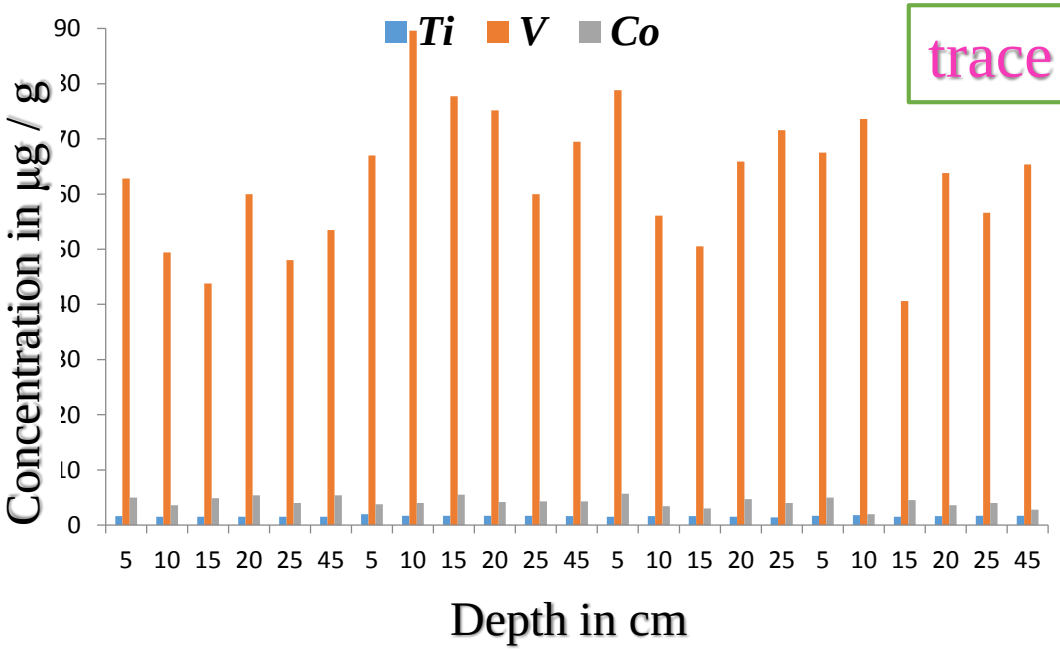
Results & Discussion

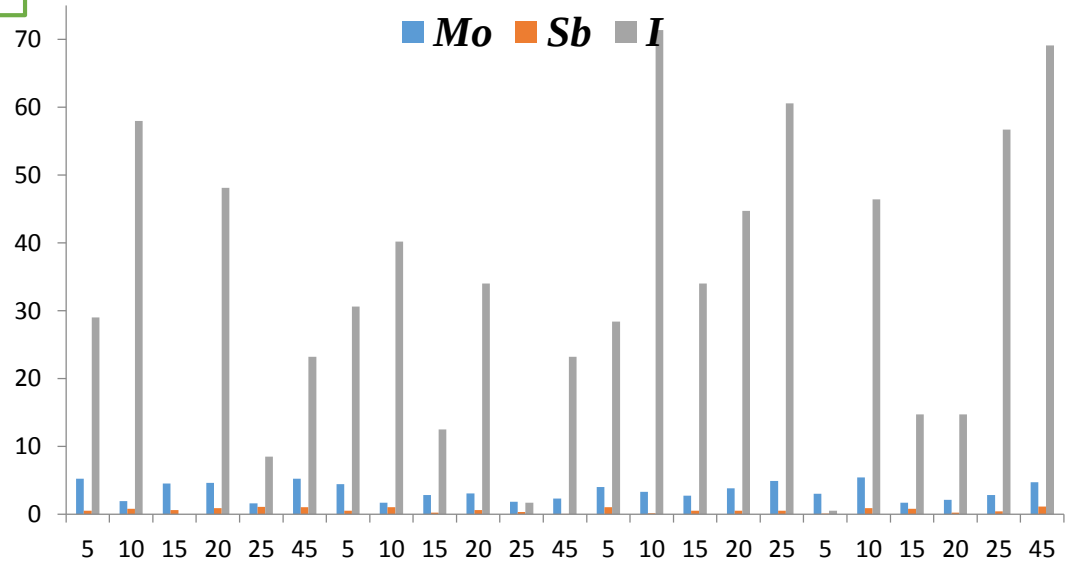
Uniform

the site was not exposed to pollution



trace elements



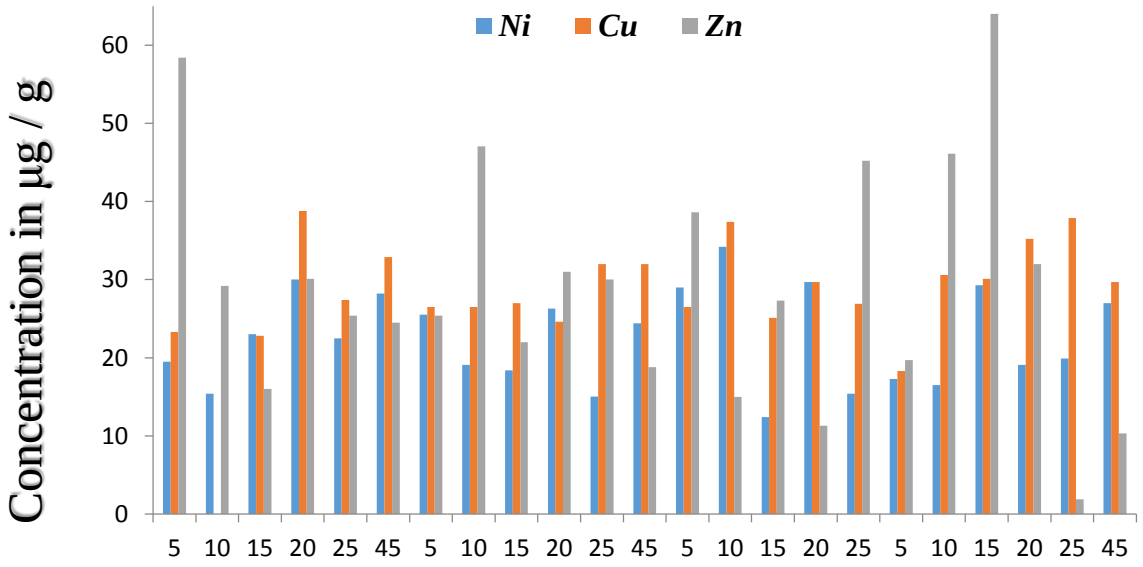


Results & Discussion

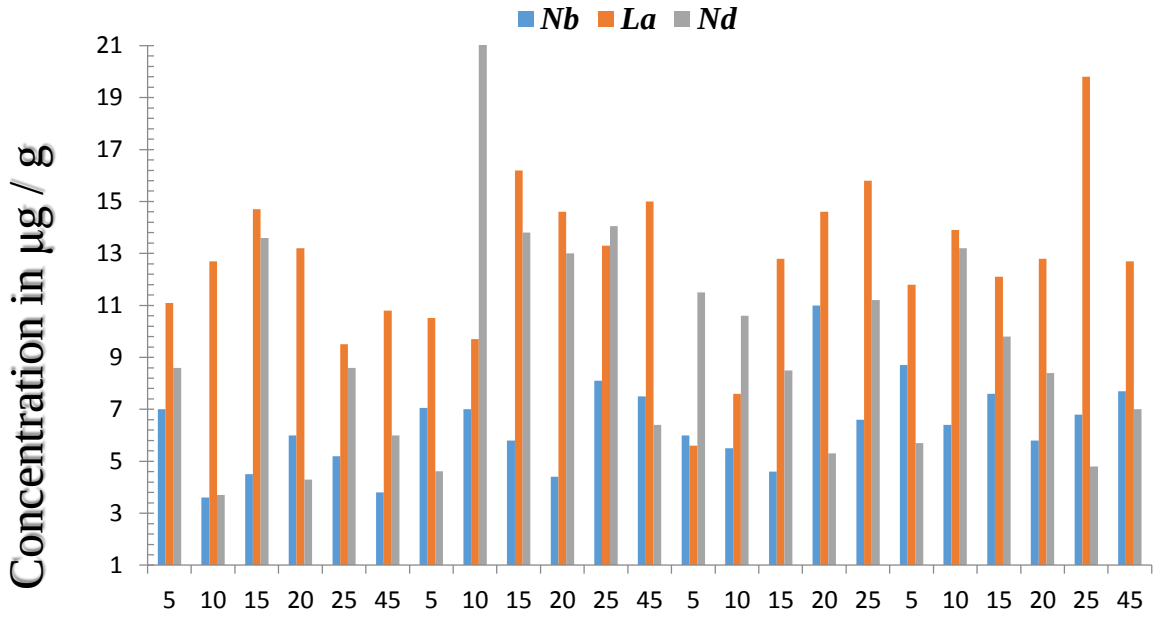
Metal elements

Uniform

Rare Earth



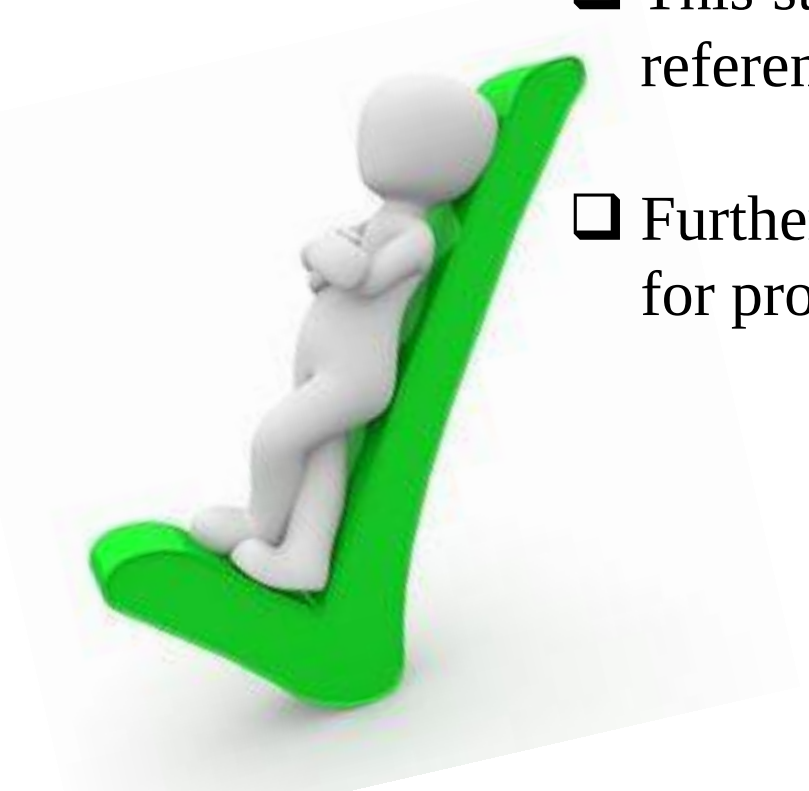
Depth in cm



Depth in cm

the site was not exposed to pollution by metallic elements.

Conclusion



- The obtained results indicates that the concentrations of major, minor and trace elements in the soils were mainly controlled by natural sources

- This study could serve as a credible database of the region for future references and do not present any pollution inputs.

- Further research in other areas of the region would improve the basis for proposing such soil quality standards.


THANK YOU FOR YOUR
ATTENTION