


Document details

[Back to results](#) | 1 of 1

[Export](#)
[Download](#)
[Print](#)
[E-mail](#)
[Save to PDF](#)
[Add to List](#)
[More...](#)
[Full Text](#) View at Publisher

 Environmental Science and Pollution Research
 Volume 24, Issue 29, 1 October 2017, Pages 22861-22872

Key indicator tools for shallow slope failure assessment using soil chemical property signatures and soil colour variables (Article)

 Othman, R. , Hasni, S.I., Baharuddin, Z.M., Hashim, K.S.H.-Y., Mahamad, L.H. 

International Institute for Halal Research and Training (INHART), Herbarium Unit, Department of Landscape Architecture, Kulliyah of Architecture and Environmental Design, International Islamic University Malaysia, Kuala Lumpur, Malaysia

Abstract

[View references \(34\)](#)

Slope failure has become a major concern in Malaysia due to the rapid development and urbanisation in the country. It poses severe threats to any highway construction industry, residential areas, natural resources and tourism activities. The extent of damages that resulted from this catastrophe can be lessened if a long-term early warning system to predict landslide prone areas is implemented. Thus, this study aims to characterise the relationship between Oxisols properties and soil colour variables to be manipulated as key indicators to forecast shallow slope failure. The concentration of each soil property in slope soil was evaluated from two different localities that consist of 120 soil samples from stable and unstable slopes located along the North-South Highway (PLUS) and East-West Highway (LPI). Analysis of variance established highly significant difference ($P < 0.0001$) between the locations, the total organic carbon (TOC), soil pH, cation exchange capacity (CEC), soil texture, soil chromaticity and all combinations of interactions. The overall CIELAB analysis leads to the conclusion that the CIELAB variables lightness L^* , c^* (Chroma) and h^* (Hue) provide the most information about soil colour and other related soil properties. With regard to the relationship between colour variables and soil properties, the analysis detected that soil texture, organic carbon, iron oxide and aluminium concentration were the key factors that strongly correlate with soil colour variables at the studied area. Indicators that could be used to predict shallow slope failure were high value of L^* (62), low values of c^* (20) and h^* (66), low concentration of iron (53 mg kg^{-1}) and aluminium oxide (37 mg kg^{-1}), low soil TOC (0.5%), low CEC (3.6 cmol/kg), slightly acidic soil pH (4.9), high amount of sand fraction (68%) and low amount of clay fraction (20%). © 2017, Springer-Verlag GmbH Germany.

Reaxys Database Information

[View Compounds](#)

Author keywords

CIELAB Early warning system Key indicator assessment Oxisol Shallow slope failure Soil chemical properties

Indexed keywords

GEOBASE Subject Index: aluminum oxide cation exchange capacity early warning system iron oxide landslide Oxisol slope failure soil chemistry soil color soil property total organic carbon

Regional Index: Malaysia

 ISSN: 09441344
 CODEN: ESPLE
 Source Type: Journal
 Original language: English

 DOI: 10.1007/s11356-017-9715-9
 Document Type: Article
 Publisher: Springer Verlag

References (34)

[View in search results format](#)
 All [Export](#) [Print](#) [E-mail](#) [Save to PDF](#) [Create bibliography](#)
 1 Ajayi, A.E., Dias Junior, M.d.S., Curi, N., Araujo Junior, C.F., Souza, T.T.T., Inda Junior, A.V.

Strength attributes and compaction susceptibility of Brazilian Latosols

 (2009) *Soil and Tillage Research*, 105 (1), pp. 122-127. Cited 30 times.
 doi: 10.1016/j.still.2009.06.004

Metrics

0 Citations in Scopus

0 Field-Weighted Citation Impact


 PlumX Metrics
 Usage, Captures, Mentions,
 Social Media and Citations
 beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

[Set citation alert](#)
[Set citation feed](#)

Related documents

Soil colour as a simple indicator of load bearing capacity in Brazilian Latosols

 Ajayi, A.E., Dias Junior, M.S., Curi, N.
 (2011) *Journal of the Indian Society of Soil Science*

Soil color analysis for statistically estimating total carbon, total nitrogen and active iron contents in Japanese agricultural soils

 Moritsuka, N., Matsuoka, K., Katsura, K.
 (2014) *Soil Science and Plant Nutrition*

Colourimetric variations in burnt granitic forest soils in relation to fire severity

 Cancelo-González, J., Cachaldora, C., Díaz-Fierros, F.
 (2014) *Ecological Indicators*
[View all related documents based on references](#)
[Find more related documents in Scopus based on:](#)
[Authors](#) [Keywords](#)