



The Abdus Salam
International Centre for Theoretical Physics



smr2163

College on Soil Physics

Soil Physical Properties and Processes under Climate Change

30 August - 10 September 2010

(Miramare, Trieste, Italy)

Directors

Donald GABRIELS *Department of Soil Management
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BOOK OF ABSTRACTS

web-page: <http://agenda.ictp.trieste.it/smr.php?2163>

Growth and carbon storage of three young timber species in the Yungas of Bolivia (QUISPE MAMANI J.C. - Technical Unit of International Relations, La Paz, Bolivia) 15'

Soil physical and hydraulic properties by different soil tillage systems (SCHOLL Peter - University of Natural Resources and Applied Life Sciences, Vienna, Austria) 15'

The effect of time-variable soil hydraulic properties in soil water simulations (SCHWEN Andreas - University of Natural Resources and Applied Life Sciences, Vienna, Austria) 15'

Interactive effects of rising temperature and lowering moisture on soil water chemistry: An experimental growth-chamber approach (MAYMO HERNANDEZ Ana C. - Centro de Investigaciones sobre Desertificación, Ahal, Spain) 15'

Friday 10 September 2010 (Room: Leonardo da Vinci Building Main Lecture Hall)
Chairperson: Donald Nielsen

08:30 - 09:45 Presentations by participants

Uncertainty: a problem to rank desertification indicators (FUZZY-MCDM Methods) (SEPIER Adel - University of Irbid, Iraq) 15'

Soil sustainability in relation to soil erosion in Shivalik of Lower Himalayas (SINGH Manmohanjit Punjab Agricultural University, Ludhiana, India) 15'

Land degradation by erosion: Samanalawewa catchment, Sri Lanka (UDAYAKUMARA E.P.N. - Asian Institute of Technology, Pathumthani, Thailand) 15'

Historical changes in the environment of the Chinese Loess Plateau (WANG Li - Institute of Soil and Water Conservation, Shaanxi, P.R. China) 15'

Effectiveness of IWK biocontrol application on growth of rubber in the nursery (YAHYA Abd Karim - Malaysian Rubber Board, Selangor, Malaysia) 15'

09:45 - 10:30 --- Coffee Break ---

10:30 - 12:00 Presentations by ICTP Associates

Application of stable isotopes and soil geochemistry for understanding soil formation and paleoclimate (ACHYUTHAN Venu - Anna University, Chennai, India) 30'

Haas for soil carbon sequestration in Africa (ADENYI M.O. - University of Ibadan, Nigeria) 30'

An evaluation of the spatial variability of soils of similar lithology under different land use types and degradation risks in a savannah agro-ecology of Nigeria (EZEAKU Peter I. - University of Nigeria, Nsukka, Nigeria) 30'

12:00 - 14:00 --- Lunch Break ---

**14:00 - 14:45 Donald Nielsen / Department of Land, Air and Water Resources, University of California, Davis, USA
Soil Physics - some of the past and today's opportunities**

14:45 - 15:30 Closing Session and Farewell

TITLES OF PRESENTATIONS

in alphabetical order

(as of 23 August 2010)

SCHOLL Peter - University of Natural Resources and Applied Life Sciences, Vienna, Austria

Soil physical and hydraulic properties by different soil tillage systems

SCHWEN Andreas - University of Natural Resources and Applied Life Sciences, Vienna, Austria

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SEPEHR Adel - University of Isfahan, Istahan, Iran

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SINGH Manmohan Jit - Punjab Agricultural University, Ludhiana, India

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Historical changes in the environment of the Chinese Loess Plateau

YAHYA Abd Karim - Malaysian Rubber Board, Selangor, Malaysia

Effectiveness of IWK biocontrol application on growth of rubber in the nursery

ZHANG Xiao - China Agricultural University, Beijing, P.R. China

A new heat pulse sensor for measuring soil profile evaporation

ZHOU Beibei - Institute of Soil and Water Conservation, Yangling, P.R. China

Effects of rock fragments on water movement and solute transport in a Loess Plateau soil

Uncertainty; a Problem to Rank Desertification Indicators (FUZZY-MCDM Methods)

Adel Sepehr

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Abstract:

Desertification assessment and monitoring studies have focused on providing reliable data and information sources, to underscore the understanding of the causes of desertification, in order to forecast and combat future desertification, as well as to mitigate the effects of on-going processes. Seems whatever have most important in all of desertification studies is selecting, ranking, scoring and preference of desertification indicators to develop desertification indicators system which is guideline to apply management projects to combat desertification process. Ranking objects is a simple and natural procedure for organizing data. It is often performed by assigning a quality score to each indicator according to its relevance to the problem at hand. Ranking is widely used for indicator selection, when resources are limited and it is necessary to select a subset of most relevant objects for further processing. In real world situations, the object's scores are often calculated from noisy measurements, casting doubt on the ranking reliability. Uncertainty is one of the main problems to select, rank and integrate indicators to preference them. In this paper have been introduced a Fuzzy-MCDM method for assessing the influence of uncertain levels on the ranking reliability. This paper tries to illustrate MCDM method for selection, scoring and preference of desertification indicators. In the first step, were identified the main desertification indicators based on main criteria. Then, to reduce uncertainty a triangular fuzzy set was applied for weighting borders of indicators. Ultimately a MCDM algorithm based on outranking method ELECTRE was developed. Results indicated that selection of fuzzy borders can be a reliable way to reduce uncertainty. Also Outranking method of decision making is a suitable tool to rank indicators.

Keywords: ELECTRE, Fuzzy, MCDM, Uncertainty, Desertification Indicators