

Development of Desertification Indicator System Base on DPSIR (Take advantages of Fuzzy-TOPSIS)

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Extended abstract

1- Introduction

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 has most important in all of desertification studies is selecting, ranking, scoring and preference of desertification indicators to develop desertification indicator systems 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.

2- Methodology

In this paper have been introduced a Fuzzy-MCDM method for developing desertification indicator system. This paper tries to illustrate TOPSIS 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 Fuzzy TOPSIS algorithm was developed.

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3- Discussion

According to the applied Fuzzy-TOPSIS algorithm, the anthropogenic parameters such as human activities and land use alternations are main criteria to desertification process.

Also to make a risk management pattern, attention to the pressure and state indicators must be notable. Another word, the results indicated the pressure and state indicators as main and high preference indicators for desertification risk management.

Results indicated that selection of fuzzy borders can be a reliable way to reduce uncertainty. Also TOPSIS method of decision making is a suitable tool to rank indicators.

4- Conclusion:

TOPSIS proved to be a cost-effective and flexible method, as it provides a screening tool to identify, prefer and weight indicators for further investigation. However, this approach is not intended to substitute a scientific analysis of the indicators based on experimental research. After ranking indicators based on expert (and policy) relevance, they have then to be transformed into operational indicators, by conducting field research where necessary, to actually develop and integrate them into structured indicator sets. Furthermore, indicators can be selected and substituted to match the specific characteristics of each region. Since the land degradation conditions are various in different regions, the method can be applied with proper adjustment, provided the principal factors affecting

desertification are identified and the relevant data layers are available.

Keywords: TOPSIS, Fuzzy, MCDM, Risk Management, Desertification Indicators

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