

Vulnerability Level and Degree of Drought in Rural Areas, the Farmers Perspective

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Extended Abstract

Introduction

Drought is a deficiency in precipitation over an extended period, usually a season or more, resulting in a water shortage causing adverse impacts on vegetation, animals, and/or people. It is a normal, recurrent feature of climate that occurs in virtually all climate zones, from very wet to very dry. Drought is a temporary aberration from normal climatic conditions that can vary significantly from one region to another. It is different from aridity, as a permanent feature of climate in the regions where low precipitation is the norm, as in a desert. Human factors, such as water demand and water management, can exacerbate the impact that drought has on a region. Because of the interplay between a natural drought event and various human factors, the drought has different meanings among different people. In practice, drought is defined in a number of ways that reflect various perspectives and interests. It is difficult to be defined precisely, but operational definitions often help define the onset, severity, and the end of droughts. No single operational definition of drought works in all circumstances, and this is why policy makers, resource planners and others have more trouble recognizing and planning for drought than for other natural disasters. In fact, most drought planners now rely on mathematic indices to decide when to start implementing water conservation or measures in response to drought. In this study, the drought can be defined as Agricultural drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, soil water deficits, reduced ground water or reservoir levels needed for irrigation, and so forth. Drought is not itself a disaster for nature, the disaster occurs when we consider the demand people have for their water supply. Human beings often increase the impact of drought because of high use of water. This cannot be supported when the natural supply decreases. Droughts occur in both developing and developed countries and can result in economic and environmental impacts and personal hardships. All societies are vulnerable to this natural hazard.

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Methodology

Agricultural drought occurs when there isn't enough soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought happens after meteorological drought but before hydrological drought. Agriculture is usually the first economic sector to be affected by the drought. In this study, vulnerability of drought in rural communities was investigated as a problem for agriculture. In this regard, socio-economic drought is what happens when physical water shortage starts to affect people, individually and collectively. In more abstract terms, most socioeconomic definitions of drought are associated with the supply and demand of an economic good. To achieve the goal, literature review and field survey methods have been used. Sulduz rural area in west Azarbaijan was the statistical population of the study. Therefore, ten villages were selected as samples. This selection was carried out by considering the criteria such as information of township disasters, type of agriculture and population. According to Cochran formula, 300 questionnaires were filled randomly. To interpolate drought in rural areas, the levels of vulnerability have initially been studied in the selected villages. Data were analyzed using different statistical methods such as comparison of averages and Analysis Of Variance in SPSS software. Interpolation of drought severity and vulnerability in rural areas has been done by Spline method in GIS.

Results and Discussion

There are some methods to interpolate randomly the spaced point data. Some of these methods are global while others are local. Global methods utilize all the known values to evaluate an unknown value, while in local methods only a specified number of nearest neighbors are used to evaluate an unknown value. The Spline tool uses an interpolation method to estimate values using a mathematical function that minimizes overall surface curvature. The Spline with Barriers tool uses a method similar to the technique used in the Spline tool, with the major difference that this tool honors discontinuities encoded in both the input barriers and the input point data. This study investigated drought intensity and vulnerability in Sulduz rural district by drought evaluation of the farmer's point of view. Finally, villages of the study area were classified based on the data obtained from the field survey. The results of the present study showed that villages have difference in the vulnerability levels. Therefore, drought impacts will reduce vulnerability in rural through awareness of drought vulnerability levels. In Sulduz rural district, villages were classified in the five ranges from very low to very high. In higher risk villages the Quick and Helbi were recognized as the most vulnerable villages.

Conclusion

Drought is different from tornadoes, hurricanes, and floods. It is more difficult to be detected and it can last much longer than other weather events. We don't have watches or warnings for drought like we do for other natural hazards. But just because drought is different from other natural disasters doesn't mean we cannot plan for it and take steps to help protect ourselves from the effects of that. The social and economic costs of drought require decision makers to improve planning, mitigation, and adaptation strategies to deal with this hazard. The spatial interpolation methods were developed either for specific disciplines or even for specific variables based on the data properties modeled. Each method has its specific assumptions and features. These features are including global versus local, exact versus inexact, deterministic versus stochastic, and gradual versus abrupt. As Geographic Information Systems (GIS) and modeling techniques are becoming powerful tools in natural resource management and biological conservation, spatial continuous data of environmental variables are increasingly required.

Keywords: drought, interpolation, rural farmers, Sulduz Rural Area, vulnerability.