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Choosing Different Evaluating Options for Irrigation Water Using Multiple Methods

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Introduction

It is difficult for public decision-makers to choose from a variety of options when designing and implementing the irrigation water pricing policy required by the Water Framework Directive. The main goal of this study is to come up with a multi-methodological strategy that helps people make decisions about which option is the best compromise between a set of socioeconomic and environmental factors in irrigated areas. A case study is used in two irrigation districts in the province of Palencia (Spain) to accomplish this. The steps in the proposed method are as follows: A hybrid multi-criteria decision making model that incorporates the Analytic Hierarchy Process and the modified Technique for Order Preference by Similarity to Ideal Solution is used to rank the alternatives. a) The selection of potential alternatives to be evaluated; b) The classification of farmers into homogeneous groups; c) The simulation of the behavior of irrigated farmers when confronted with various water pricing alternatives via positive mathematical programming models; d) The selection of the socioeconomic and environmental criteria for the analysis.

Description

The outcomes demonstrate the usefulness and efficacy of the proposed methodological framework for selecting irrigation water pricing instruments. This study's empirical findings suggest that, as opposed to tools that price water based solely on current consumption, those pricing instruments that take into account current irrigation water consumption offer a better compromise option. Instead of establishing a single irrigation water pricing instrument and tariff level for a river basin as a whole, the results also suggest that the irrigation water pricing policy could be implemented in each farming district, as this would not allow for the same degree of compromise in each farming district. Due to factors both external (globalization, economic growth, climate change) and internal (new social demands) to the European Union, European agriculture is going through a cycle of policy changes. In the area of water policy, the Water Framework Directive, if the irrigation water pricing policy is applied exhaustively in terms of financial, environmental, and resource cost-recovery terms, it could jeopardize the sustainability of irrigated agriculture, bearing in mind that it will produce negative effects from the economic (economic profitability of farms) and social (decrease in demand for labor) points of view. As a result, the growing environmental consciousness of European society has resulted in a change in the direction that the Union In point of fact, public administration will face difficulties in rural areas with low profitable irrigation performance in successfully achieving the environmental goals of the WFD without jeopardizing the multifunctional system's economic and social viability [1].

As a result, policymakers will need to choose an economic tool that allows for a better compromise between the socioeconomic and environmental performance of irrigated farms. The purpose of this work is to support the selection of irrigation water pricing alternatives that allow for a better compromise between the competing socioeconomic and environmental criteria. In order to accomplish this, a method that is based on mathematical programming techniques will be used to simulate the behavior of irrigators. This will allow for the collection of a set of socioeconomic and environmental characteristics. These characteristics will then be used in a hybrid model of the Analytic Hierarchy Process (AHP) and the modified Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) to rank the water pricing options in terms of how well they perform in relation to the characteristics of the economy and the environment An actual agricultural system has been used for an empirical application to put this goal into practice. Two irrigated regions in the province of Palencia (Spain) have been examined in particular. The purpose of this study is to provide policymakers with a useful tool for designing and putting into action the best tools for improving the "governance" of irrigated agricultural systems and achieving a balance in the sustainable performance of irrigated areas: financial practicality, social acknowledgment and eco-similarity [2-5].

Conclusion

The structure of the paper is as follows: A description of the studied areas used for the empirical analysis follows this introductory section. The third segment offers a point by point depiction of the system utilized. The results are summarized in the fourth section, and the main conclusions are discussed in the final section.

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