Semantic Web-Based Structural Equation Modeling and Mediating Effects Are Used to Investigate Key Factors

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ABSTRACT

Land desertification is the key contradiction restricting the sustainable development of Chinese society. Farmers and herders' behavior in desert management is particularly important for the smooth development of the desertification control project. Although farmers and herders express willingness, they do not engage in desert management behavior. The research through random sampling survey analyzes survey data from 572 farmers and herders in the Kubuqi Desert region of Inner Mongolia using structural equation modeling and mediation analysis, based on the TPB. The aim is to understand the paradoxical willingness and behavior of farmers and herders to participate in desert management. The study found that farmers and herders' willingness to participate is a crucial factor that influences their behavior. The authors suggest cultivating a sense of ecological responsibility and strengthening ecological education to guide the behavior of farmers and herders towards more sustainable practices.

KEYWORDS

Desert Management, Deviant Behavior, Farmers and Herders, Mediating Effect Model, Structural Equation Model

INTRODUCTION

Desertification is a severe ecological and environmental problem in China, with 257.37 km² of desertified land area and 168.78 km² of sandy land area, accounting for about 1/6 of the national land area (Ministry of Ecology and Environment of the People's Republic of China, 2022). Desertification not only leads to the deterioration of the ecological environment and poverty in sandy areas, but also poses a significant threat to the national economy and sustainable social development. These facts are supported by data from China Ecological Environment Bulletin (2021). The prevention and control of desertification is a crucial issue that must be addressed in building a sustainable ecological civilization system for society. It is a significant accomplishment and will continue to be so for centuries to come. To effectively combat desertification and improve the environment in sandy areas, it is crucial to understand the motivations and actions of farmers and herders in participating in desert control efforts. Encouraging their participation not only helps curb land desertification,

but also has the potential to increase the income of farmers and herders, making it a practical and significant approach to improving the quality and efficiency of the sand industry.

Although the governance achievements of the Kubuqi Desert are commendable, the foundation of the Kubuqi Desert is not stable, and the areas that have initially been controlled may still experience desertification. The desert governance of farmers and herders in the Kubuqi Desert area is still not complete due to the influence of local ecological environment governance policies and mechanisms, the development of forestry and sand enterprises, and the degree of farmers and herders' participation in desert governance. There is still a long way to go on the road of promoting the governance of Kubuqi Desert.

This paper proposes a theoretical analysis framework for farmers' and herders' willingness to participate in desert management and behavioral deviation based on the theory of planned behavior. The framework introduces ecological emotion as a latent variable and uses survey data from 572 farmers and herders in the Kubuqi sand area of Inner Mongolia to select a structural equation model. In this study, we examine the impact of farmers' and herders' willingness and behavioral deviations, while also exploring the moderating role and interaction of these indicators in the influence paths. As the micro subject of desert management, the willingness and behavior of farmers and herders in desert management directly affect the sustainability of desert control projects. This study takes the Kubuqi Desert area in Inner Mongolia as an example to study the willingness and behavior of farmers and herders in desert management, which has important strategic significance for the comprehensive management, sustainable development, and ecological civilization construction of China or similar Kubuqi Desert areas. The study will make a new contribution to the realization of China's transformation into an ecological civilization power in the new era.

RELATED WORK

Willingness and Influencing Factors

According to academic research, willingness is considered a crucial factor that often determines an individual's decision-making process and subsequent behavior. However, it has been observed that the attitude towards receiving behavior also plays a significant role in actual behavior generation (Zhang et al., 2023; Guo et al., 2021). According to recent studies (Galván et al., 2022; Ilyas et al., 2022; Teragni & Pons 2022), farmers' behavior choices may not always align with their initial intentions due to subjective norms and other factors. This means that there may be a certain degree of deviation between farmers' intentions and their actual behavior, or that obstacles may arise during the process of translating intentions into actions. The relationship between willingness and behavior has evolved significantly. Willingness was used to guide practical decision-making. However, it now involves theoretical integration and empirical analysis of alternative behaviors (Singh, 2018).

Intention and Action Are Incompatible

Current research on farmers' participation intention and behavior has primarily centered around land transfer (Gao et al., 2022; Zhu et al., 2022; Lin et al., 2022; Li et al., 2022). Green production behavior (Ren et al., 2022; Chang et al., 2021; He et al., 2023; Huang et al., 2023).Domestic waste treatment (Zhou et al., 2022; Xu et al., 2020; Zheng et al., 2022).Scholars have contributed to the analysis of factors influencing willingness, behavior, and deviations in various fields such as large-scale livestock (He 2020; Han et al., 2022) and poultry breeding, technical services, and technology adoption (Huang et al., 2022; Gao et al., 2022; Ren et al., 2022; Ren & Zhong, 2022; Yang et al., 2020). Wen et al. (2019) subdivided farmers' resource endowment based on different factors, while Liu et al. (2017) and Shi & Zhang (2022) primarily focused on studying the differences in farmers' willingness and behavior from the perspective of resource endowment heterogeneity.

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