



A Sociological Analysis of Determinants of Citizens' Participation in Environmental Protection: A Theory of Planned Behavior Approach

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ABSTRACT

Introduction: In recent years, environmental crises have become one of the major challenges facing urban societies worldwide. In this context, citizen participation in environmental protection is considered a fundamental strategy for achieving environmental governance and sustainable management. The present study aimed to analyze the sociological factors influencing citizens' participation in environmental protection, based on the framework of the Theory of Planned Behavior.

Methodology: The statistical population consisted of citizens over 18 years of age in Sanandaj. Using a multistage cluster sampling method and Cochran's formula, a total of 424 individuals were selected as the final sample. Data were collected through a questionnaire and analyzed using SPSS and SmartPLS software.

Results: The path analysis results showed that, among the eight proposed hypotheses, five were confirmed and three were rejected. The variables of participation awareness, perceived behavioral control, participation intention, and political environment had significant positive effects on citizens' participatory behavior, whereas perceived benefits and subjective norms had no significant effect on behavioral intention. In addition, the mediating role of participation intention in the relationship between awareness and perceived control with participatory behavior was confirmed.

Conclusions: The findings indicate that urban environmental protection participation is influenced less by individual attitudes and more by actual awareness, self-efficacy, and institutional-political contexts. Therefore, strengthening environmental literacy, creating transparent participatory platforms, and enhancing public trust in responsible institutions are suggested as effective strategies to promote citizens' participation in environmental policymaking.

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Introduction:

Currently, environmental protection is considered a fundamental priority for human life on Earth. The challenges of preserving the environment, considering the limited natural resources, have become a global concern (Akbari Nodeh et al., 2023). Environmental degradation in one country can pose serious threats to global health and sustainability. Actions such as uncontrolled deforestation, illegal hunting, soil, air, and water pollution, and overconsumption of natural resources are major threats to environmental integrity (Mohammadzadeh Rahni, 2010).

Globally, citizens face diverse environmental challenges, including climate change, ozone depletion, waste accumulation, hazardous waste disposal, degradation of biological resources, deforestation, and desertification (Tolba, 1992). These challenges require effective and coordinated measures, and in Iran, as in many countries, addressing them demands active citizen involvement. Public participation in environmental decision-making, safety, and education has been recognized as a critical factor in supporting institutional efforts to protect the environment (Fiorino, 1990; Shepherd & Bowler, 1997). Participation provides additional information at relatively low cost, enhances public trust and acceptance of governmental decisions, educates and empowers citizens, and strengthens democratic values (Fiorino, 1990; Heiman, 1997; Shepherd & Bowler, 1997; Spyke, 1999).

Contemporary environmental governance discourse increasingly emphasizes participation, particularly due to the growing complexity of environmental problems, interdependencies, new governmental roles, and unstructured policy challenges. Participation serves to: a) bridge the gap between scientifically defined environmental issues and stakeholders' experiences, values, and actions; b) increase transparency regarding diverse, often conflicting interests; c) provide a significant learning opportunity for participants, enhancing the quality of environmental decision-making; and d) prevent implementation problems, foster commitment among stakeholders, and improve democratic dimensions of governance (Bulkeley & Mol, 2003).

Citizen engagement is recognized as a fundamental component of sustainable development, contributing to individual competence, dignity, and social responsibility (Fatahi et al., 2020). Policies designed to address environmental challenges without broad public support are unlikely to succeed (Inglehart, 1995). The Theory of Planned Behavior (TPB) provides a valid analytical framework for explaining participatory behavior by highlighting three key components: attitude, subjective norms, and perceived behavioral control. This approach allows for a multidimensional sociological analysis of environmental participation, considering not only information and knowledge but also social pressures, individual perceptions, and self-efficacy.

In the city of Sanandaj, the capital of Kurdistan Province, recent environmental crises have been severe. Air pollution data indicate that PM_{2.5} levels often exceed international standards, and waste management challenges, including the disposal of over 600 tons of waste daily with minimal recycling, exacerbate environmental degradation (Environmental Protection Organization of Kurdistan, 2022; Shafie et al., 2020). Structural weaknesses, including limited public awareness and insufficient environmental education, highlight the importance of citizen participation in environmental governance (Badi'i et al., 2019). Thus, understanding the sociological determinants of citizens' environmental behavior is crucial for designing policies that enhance participation and promote sustainable urban development. This study aims to analyze the factors that influence participatory behavior in Sanandaj within the framework of the Theory of Planned Behavior, identifying the most significant determinants of effective citizen engagement in environmental protection.

Methodology:

This study employed a survey-based quantitative approach to investigate the sociological determinants of citizens' participation in environmental protection in Sanandaj. The statistical population included residents aged 18 years and above, based on the 2016 population and housing census (412,767 individuals). Using Cochran's formula, a sample size of 384 was determined, and to reduce sampling error, 450 questionnaires were distributed, of which 424 valid responses were analyzed. Respondents were selected using multistage cluster sampling: the city was divided into 3 main districts, 21 neighborhoods,

and 89 local areas. From each district, one neighborhood was randomly selected, followed by one local area per neighborhood, and finally, residential units within each local area were randomly chosen. The characteristics of the sample are presented in Table 3.

Data were collected using a structured questionnaire designed to measure key constructs, including awareness, perceived behavioral control, subjective norms, perceived benefits, political environment, and behavioral intention. The questionnaire was reviewed by several experts in environmental sociology and research methodology to ensure content validity, and necessary revisions were applied based on their feedback.

For evaluating the construct validity and reliability, multiple indices were employed, including factor loadings, Cronbach's alpha, composite reliability (CR), rho_A, average variance extracted (AVE), and variance inflation factor (VIF). All items exhibited factor loadings above 0.6, exceeding the acceptable threshold of 0.4, indicating that each item adequately represents its latent variable. Convergent validity was confirmed with AVE values exceeding 0.5 for all constructs. Reliability indices—including Cronbach's alpha, CR, and rho_A—were all above 0.7, demonstrating satisfactory internal consistency. VIF values ranged primarily between 1.3 and 2.8, below the critical value of 5, indicating no significant multicollinearity among items and ensuring relative independence of the variables in the model.

While demographic variables such as gender, age, and education were collected, they were analyzed descriptively only, in order to focus on the theoretical constructs of the study and to maintain the length restrictions of the article. Table 1 presents the detailed measurement indices for each latent variable and its corresponding items.

Finally, data analysis was performed using SPSS for descriptive statistics and preliminary analyses, and SmartPLS was used for structural equation modeling (SEM) to test both the measurement and structural models, evaluating the relationships, mediating effects, and overall fit of the proposed model

Results and discussion:

The analysis of the proposed model revealed that out of eight hypothesized direct relationships, five were statistically significant. Awareness of participation, perceived behavioral control, subjective norms, political environment, and behavioral intention were identified as key determinants influencing citizens' participatory behavior. In particular, perceived behavioral control and awareness significantly enhanced behavioral intention, which in turn positively influenced actual participatory behavior. Subjective norms exerted a direct effect on behavior, even though their impact on intention was not significant. Furthermore, the political environment moderated the relationship between intention and behavior, indicating that supportive political conditions facilitate the translation of intentions into action. Mediating analysis confirmed that behavioral intention plays a crucial role in channeling the effects of awareness and perceived control into actual behavior. Overall, these findings highlight that both cognitive factors (awareness, self-efficacy) and institutional contexts (political environment) are central in promoting participatory environmental behaviors among citizens.

Conclusions:

This study demonstrates that effective citizen participation in environmental protection is a multidimensional phenomenon, influenced by cognitive, social, and institutional factors. Awareness of participatory mechanisms, perceived behavioral control, and supportive

political and institutional environments are pivotal in transforming intention into action. Perceived benefits alone are insufficient to promote participation in contexts with low institutional trust or limited social capital. Consequently, enhancing citizen engagement requires targeted interventions, including environmental education, transparent and accessible participatory processes, and the creation of enabling political and institutional conditions.

The results also expand the Theory of Planned Behavior by integrating contextual variables such as political environment and citizen awareness, providing a more nuanced framework for understanding environmental behavior in urban settings with limited social capital. These findings have practical implications for urban policymakers, environmental agencies, and community organizations seeking to foster sustainable civic engagement.

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Authors' contributions:

All authors contributed equally to the conceptualization, data collection, analysis, and writing of the article. The corresponding author coordinated the final editing and submission process.

Conflicts of interest:

The authors declare that there is no conflict of interest related to the publication of this article.