

Explaining Environmental Protection Behaviors Based on Environmental Attitudes, Awareness, Environmental Norms, and Cultural Consumption under Facilitating Conditions. (A Case Study of Sanandaj and Kirkuk)

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<p>Article type: Research Article</p> <p>Article history: Received: 26 January 2026 Received in revised form: 12 February 2026 Accepted: 11 March 2026 Published online: 15 June 2026</p> <p>Keywords: <i>Pro-environmental behavior, Environmental awareness and attitudes, Environmental norms, Cultural consumption, Facilitating conditions.</i></p>	<p>Objective: Environmental issues in the cities of Sanandaj, Iran, and Kirkuk, Iraq—two major cities in the Kurdistan region—face similar challenges alongside specific characteristics. In Sanandaj, air pollution, especially during the cold seasons, has turned into a crisis due to temperature inversion and the extensive use of old vehicles and fossil fuels. Both cities face threats such as climate change, biodiversity loss, and pressure on natural resources, and they require shared approaches and regional cooperation for environmental protection. In the field of environmental studies, the significance of this research stems from the shared and critical challenges faced by Sanandaj and Kirkuk. The main problem addressed by this study is the explanation of pro-environmental behaviors based on attitudes, awareness, environmental norms, and cultural consumption in interaction with facilitating conditions. This research investigates the social mechanisms affecting citizens' pro-environmental behaviors in Sanandaj and Kirkuk. The overall objective of the study is to provide a comprehensive explanation of the factors influencing pro-environmental behaviors, thereby offering a scientific basis for environmental policy-making and planning in these communities.</p> <p>Method: The dominant approach of this research is quantitative, and data were collected through an in-person survey. The data collection tool was a researcher-developed questionnaire (with closed and structured questions). Likert scale was used for indexing. The statistical population of the present study consists of citizens residing in the cities of Sanandaj and Kirkuk (the latter in Iraq). The total population of both cities is 512,842 people, of which Sanandaj has 412,767 inhabitants (according to the 2016 Population and Housing Census) and Kirkuk has 100,075 inhabitants. Due to the lack of defined sampling criteria and elements, as well as the unavailability of variance in the traits and variables under study, the sample size was estimated using Epi Info software, version 7, designed for extensive cross-sectional survey studies. In the estimation, the entire statistical population was entered with a 99% confidence level, split into two clusters proportionally (75% and 25%), yielding a sample size of 518 individuals. Subsequently, 75% of the sample (due to the larger</p>



population weight) was allocated to Sanandaj and 25% to Kirkuk. Accordingly, the sample size was set at 394 for Sanandaj and 124 for Kirkuk. A multi-stage cluster sampling method was used in these cities, whereby sample elements were selected in several stages. First, the cities were divided into several clusters or districts based on population, and one district was selected from each cluster using simple random sampling. Then, within each city, several neighborhoods were selected completely randomly from among the districts (clusters). Furthermore, from each neighborhood, proportional to the number of blocks (alleys) in that neighborhood, samples were selected completely randomly from among households, targeting individuals who were present at home and aged 18 years or older. Data were collected in July and August 2025 (Mordad and Shahrivar 1404 in the Persian calendar). For statistical analysis, descriptive statistics (mean and standard deviation), Pearson correlation, and structural equation modeling were performed using SPSS and SmartPLS software to test the acceptance or rejection of the hypotheses and the constructed theoretical model. Before presenting the results, the theoretical and operational definitions of the variables will be provided.

Findings: The findings indicate that weak infrastructure and institutional support can prevent positive attitudes and awareness from translating into practical behaviors. Pearson correlation analysis also showed that pro-environmental behaviors have the strongest positive and significant correlation with environmental awareness and attitudes, and environmental norms also have a significant positive effect. In contrast, cultural consumption showed a negative and non-significant effect, while facilitating conditions showed a negative and significant effect on environmental behaviors, which may be due to weak institutions and infrastructure. These results highlight the importance of intrapersonal factors and the complexity of their interaction with social and institutional factors. The research results show that pro-environmental behaviors among citizens of Sanandaj and Kirkuk are shaped by a combination of individual, social, and institutional factors; however, the occurrence and intensity of these influences take on meaning within the social and urban context of each city. Sanandaj, as a city with an administrative-service structure and a relatively higher level of access to education and public spaces, benefits from a more favorable environment for enhancing environmental awareness and actions, whereas in Kirkuk, given the specific economic conditions, ethno-social diversity, and infrastructural challenges, the role of institutional factors and facilitating conditions becomes more prominent.

Conclusion: The findings indicated that environmental awareness and attitudes, as intrapersonal factors, play a key role in predicting behavior, but the practical realization of these behaviors depends on the existence of tangible opportunities and infrastructure. Social norms are also influential in both cities, although their intensity and mode of



influence are shaped by the cultural context and patterns of social interaction, which differ between the two cities.

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