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Social interaction and its role in promoting environmental sustainability: A sociological study of local community practices

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Abstract

Social interaction among community members is an important factor that helps adopt and promote a sustainable approach to environmental development. This facilitates achieving a balance between the needs of community members, their respect for environmental laws, and the preservation of natural resources. The study aimed to determine the impact of social interaction in promoting environmental awareness and to analyze the influence of social factors on participation in environmental development. It also highlights some of the challenges facing environmental sustainability. The focus was on Saudi society, with a sample consisting of 265 males and females of various ages and educational levels. Researchers employed both quantitative and qualitative methods to align with the study's objectives. The analysis revealed that social interaction among community members and social media play significant roles in promoting sustainable environmental development. Additionally, social interaction enhances environmental sustainability and protection from certain challenges. It also contributes to solving some of the problems faced by the environment. In conclusion, the researchers emphasized the importance of social interaction within society, particularly in Saudi Arabia, as it contributes to advancing environmental development and fostering pro-environmental behavior.

Keywords: Development, Environment, Saudi society, Sustainability.

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1. Introduction

Social relationships between individuals in a given society arise due to their interaction with one another. This interaction is based on defining an individual's behavior (the social situation) as a response to a stimulus from another person. At the same time, it serves as a stimulus for the upcoming response that the other person will issue. Meaning that the stimulus turns into a response, and the response turns into a stimulus. Reactions alternate successively, indicating interaction [1].

The relationship between humans and the environment is pivotal and ongoing. Humans are connected to their environment, interacting with it, influencing it, and being influenced by it. It cannot be imagined that this relationship would be interrupted or stagnate, as it is a strong connection that researchers and scientists discover its strength more and more each day, especially since it represents an important axis in the study and research across many disciplines and sciences.

Therefore, environmental sustainability is one of the most significant challenges of the 21st century, as environmental degradation and climate change require all members of society to interact with and adapt to this situation. Moreover, it is challenging to achieve environmentally sustainable economies unless the world of work actively participates in this effort. Environmental sustainability has grown globally since the 1987 United Nations Conference on the Human Environment, emphasizing the need for new systems aligned with ecological preservation and climate change. It calls for developing solutions and preparing future generations to confront risks, fostering positive attitudes towards nature and the Earth [2].

Saudi Arabia's Vision 2030 strategy outlines a set of goals it aims to achieve, including environmental sustainability. This is to be accomplished through an integrated and sustainable ecosystem that seeks to preserve both development and the environment. The strategy promotes the rational use of resources to safeguard the rights of future generations, ensuring a more secure and sufficient future.

Therefore, the researcher believes that humans should adopt a sustainable development approach that balances their needs with respect for the environment and the preservation of natural resources. Moreover, raising awareness about the importance of environmental preservation and promoting sustainable environmental practices in all aspects of life is a necessary obligation that all members of society must adhere to.

1.1. Study Problem

Government leaders in Saudi Arabia struggle to integrate environmental sustainability into policies due to pressing issues like climate change, water scarcity, desertification, air pollution, and high energy consumption. A renewed strategic framework is needed for environmental preservation, resource development, and sustainable management.

Additionally, the global economy has increasingly focused on environmental issues and sustainable development as a logical consequence of the imbalance between the economic and social aspects of development on the one hand and the ecosystem on the other.

1.2. Study Objectives

The current study aims to achieve a primary objective: to analyze the role of social interaction in promoting environmental sustainability in local communities. From this primary goal, the following sub-objectives arise:

1. Determining the impact of social interaction in promoting environmental awareness.
2. Analyzing the impact of social factors affecting participation in environmental development.
3. Determining the impact of values on environmental sustainability.
4. Identifying the challenges facing environmental sustainability.
5. Reaching a proposed vision to enhance the role of social interaction in achieving environmental sustainability.

1.3. Study Questions

Main Question: What is the role of social interaction in promoting environmental sustainability?

1. What is the impact of social interaction in promoting environmental awareness?
2. How do social factors affect participation in environmental development?
3. What is the impact of values on environmental sustainability?
4. What are the challenges facing environmental sustainability?
5. What is a proposed vision to enhance the role of social interaction in achieving environmental sustainability?

1.4. Study Hypotheses

First hypothesis one: There are statistically significant differences between the average scores of the respondents on the dimensions of the social interaction scale and its role in promoting environmental sustainability, attributed to the gender variable.

Second hypothesis: There are statistically significant differences between the average scores of the respondents on the dimensions of the social interaction scale and its role in promoting environmental sustainability, attributed to the age variable.

Third hypothesis: There are statistically significant differences between the average scores of the respondents on the dimensions of the social interaction scale and its role in promoting environmental sustainability, attributed to the educational level variable.

1.5. Study Importance

Environmental sustainability is gaining international, regional, and local attention. Organizations are adopting initiatives to preserve the Earth's future. Social services play a crucial role in enhancing environmental awareness among local communities. Research on community organization studies is being bridged to understand their relationship with sustainability. This connection between local communities and sustainable environmental development goals is essential.

1.5.1. Concept of Social Interaction

Social interaction is a type of influence and response that results in changing the internal parties from what they were at the beginning. Social interaction affects individuals and those in charge of the programs themselves. According to individuals' responses, this leads to modifying their way of working and improving their behavior [3].

Openk defines social interaction as “the internal strength of collective action as seen by those who contribute to it.”

1.6. Concept of Sustainability

The Contemporary Arabic Language Dictionary refers to the word “Sustainability” as derived from the verb (dāma), meaning to last or endure. (Istadāma) means to sustain something [4]. The term also appears in the “Mufassal” dictionary, where it is generally defined as meaning continuity and renewal [5].

1.7. Sustainability Environmental

Environmental sustainability is "the avoidance of depletion or degradation of natural resources, the provision of long-term environmental quality, and the meeting of the needs of today’s population without compromising the ability of future generations to meet their own needs" [6]. Institutional continuity refers to an institution's ability to address environmental challenges while effectively maintaining its structure, core functions, operational capacity, readiness, and economic feasibility. This preserves the environment and natural resources without negatively impacting them [7].

2. Literature Review

Anthony and Bello [8] the study highlights nine skills in agricultural tourism and ten in agricultural meteorology. It recommends that the Ministry of Labor fund research to teach these skills, empowering young people and promoting self-reliance. Policymakers should also increase green jobs in the agricultural sector, thereby providing more employment opportunities.

Saleh [9] the study highlights the need for a green social work curriculum to raise environmental awareness and promote sustainability. It also proposes measures to limit population behaviors causing climate phenomena and prevent their disastrous effects.

Zahran and Alayan [10] the study investigate university students' awareness of climate change, particularly social work students, related to achieving the Sustainable Development Goals 2030, proposing a vision to enhance their understanding.

Hasim et al. [11] the study examined Malaysian universities' reliance on environmental sustainability in facility management practices, focusing on climate change, ecosystem health, biodiversity conservation, and resource consumption. It found that Malaysian universities are committed to emission management, water conservation, biodiversity preservation, and energy efficiency programs, particularly during operational and maintenance phases. However, the results did not show significant differences.

2.1. Theories and Models Explaining the Research Problem

Social Cognitive Theory: Bandura posits that learning occurs through observing a model without the learner displaying any behavior. He attributes learning to internal mental processes that take time in the observer's mind. Cognitive and social modeling involve mental internalization, similar to actual performance. The modeling process is organized and optional, aiming to achieve a goal, such as belonging to a group [12]. Bandura emphasizes the cognitive approach in interpreting interactive behavior, arguing that it is purposeful and conscious, occurring within social contexts. He believes behavior is interdependent with individuals, the environment, and their characteristics, and not isolated [12].

Community, Economic, and Sustainable Development Model: The Gillaspy [6], a sub-model, emphasizes community interventions for income, wealth, education, and social support. It incorporates sustainable development to address environmental impacts on livelihoods and future generations' challenges. It calls for rethinking personal and global behaviors, policies, and investments to preserve the planet and its people, addressing non-renewable resources, soil, water, and air.

The model promotes social and economic development, sustainable development, environmental reclamation, adult education, and 'green' livelihood opportunities, fostering communication and mutual learning through local farmers' markets and recycling [13].

2.2. The Theoretical Framework of the Study

1. Foundations of Social Interaction: Social interaction is based on several foundations, including:

Communication: Communication is crucial for individuals and groups to influence and be influenced. It drives change through tasks like informing, educating, raising awareness, and providing guidance. Social interaction relies on various forms of communication and involves interactions in different areas of life [14].

Expectation is a mental attitude and readiness to respond to certain situations [15]. Interaction is characterized by expectations between roles [16].

Social perception: Social understanding refers to an individual's capacity to comprehend others' emotional traits and attitudes, enabling them to predict their reactions to various situations [1].

Social Roles: Roles are expected behaviors in social situations, shaping an individual's perspective on social interaction. Social roles are learned through assessment, performance, and anticipation of others' behavior [17]

Symbolic Interaction: Tajj highlights that symbols, such as facial expressions, hand movements, and smiles, are essential in expressing our thoughts and emotions in the world [18].

Evaluation: Social interaction is a crucial process in which individuals evaluate their own behavior and that of others based on their actions and motivations [3].

2.3. The Importance of Social Interaction

Social interaction significantly influences human behavior, enabling newborns to learn community language and internalize society's culture. It is crucial for a child's development, personal growth, and group formation. Insufficient opportunities can lead to delayed growth. Social interaction fosters creativity, aggression, and group formation, defining individual roles and responsibilities [19].

2.4. Characteristics of Social Interaction

Social interaction is a communication process among group members driven by the desire to participate and achieve goals. It can positively or negatively influence behavior and performance expectations, foster leadership, and highlight individual abilities, with a more significant impact than individual interactions alone [20].

2.5. Factors Affecting Social Interaction

Social life is formed through individual interactions, forming human groups and relationships [21]. Social workers must consider factors that maintain cohesion within the community and understand their impact on the community's life. The most critical factors affecting social interaction dynamics include [22].

Individual Personality: Social workers must understand and differentiate between different stages of personality development to effectively impact community members. Each stage has unique mental, psychological, social, and physical characteristics, which must be considered. The social worker guides group interaction based on these characteristics and individual differences among group members, as the characteristics defining each stage are not uniform across all group members.

Economic Conditions: Economic circumstances significantly influence an individual's values and perspectives, necessitating social workers to understand community members' living and economic conditions to comprehend how these conditions impact individual responses and interaction dynamics.

Family conditions: Family circumstances significantly impact community relationships, shaping an individual's self-image and sense of place. The family influences an individual's perception of their status within the community.

Previous social experiences: The impact of past social experiences on individuals in a community significantly influences their behaviors and attitudes, affecting their ability to form new relationships. Successful social interactions increase success rates, while failures in previous experiences hinder new life contributions.

Environmental Sustainability Goals and Principles:

Environmental sustainability aims to achieve goals such as respecting the natural environment, raising public awareness, achieving resource rationalization, linking modern technology to community goals, and making necessary changes to society's needs and priorities [23].

2.6. Environmental Sustainability Requirements

2.6.1. The Economic Aspect of Environmental Sustainability

According to Douglas [24], environmental sustainability focuses on reducing overconsumption, optimizing resource use, addressing global pollution, ensuring resource distribution equality, and prioritizing government spending over military expenditures.

The Social Aspect of Environmental Sustainability: This is represented by

- Controlling demographic growth.
- Distributing the population evenly across different areas.
- Reducing unemployment by creating job opportunities in various fields, relying on both the public and private sectors together [25].

The Environmental Aspect of Environmental Sustainability: This is represented by

- Protecting agricultural land from urban expansion, desertification, and erosion.
- Preserving surface and groundwater, as well as freshwater resources.
- Protecting the climate from global warming to ensure that rainfall patterns, vegetation cover, sea level rise, and ultraviolet radiation do not change [26].

2.7. Study Methodology

Understanding the role of social interaction in promoting environmental sustainability in local communities. The researcher used the case study method in the current study, focusing on the city of Riyadh, relying on both quantitative and qualitative approaches, known as the mixed-methods approach, which combines both quantitative and qualitative data in a single study to understand the research problem.

2.7.1. Types of Data and Their Sources

The researcher relied on two sources for data collection: library data and field data.

Study Population: The study population comprises the Saudi community in general and the residents of the Riyadh region.

Study Sample consisted of 265 individuals, selected using a convenience sampling method.
Characteristics of the study sample based on variables such as gender, age, and educational level.

Table 1.
Distribution of the study sample.

Variable	Group	Frq.	%
Gender	Males	118	44.53
	Females	147	55.47
Total		265	100
Age	20 to less than 30	80	30.19
	30 to less than 40	103	38.87
	40 years and over	82	30.94
Total		265	100
Educational level	Secondary	61	23.02
	Bachelor	128	48.30
	Master	52	19.62
	PHD	24	9.06
Total		265	100

Study Tool: The researcher deemed the questionnaire the most suitable tool for achieving the study's objectives, based on the nature of the data and the methodology employed, which was developed based on literature and previous studies related to the subject.

2.7.2. Study Limits

Subjective limits: This study focuses on understanding the role of social interaction in promoting environmental sustainability within local communities.

Spatial limits: This study was conducted in …….

Human limits: The study was applied to a sample consisting of 265 individuals.

Temporal limits: The study was conducted during the … semester of the … academic year (AH).

2.7.3. Statistical Data Processing

To obtain the research results, the researcher used the Statistical Package for the Social Sciences (SPSS) and employed various statistical methods that align with the nature of the required data, such as:

1. Calculate the t-test
2. Pearson's correlation coefficient.
3. Cronbach's Alpha Coefficient.
4. Relative weight for each statement.
5. The degree of estimation of responses was calculated according to the arithmetic mean (AM) value as follows:
6. The score is low if the AM is 1 to less than 1.66.
7. The score is moderate if the AM is from 1.67 to less than 2.33.
8. The score is high if the AM is from 2.34 to 3.
9. One-Way Analysis of Variance (ANOVA).
10. Post Hoc Tests were conducted using the Least Significant Difference (LSD) method.

2.7.4. Validity of the Questionnaire

Validity tests ensure that questionnaire content measures intended outcomes. Study objectives and questions are defined, translated into hypotheses, and reviewed, followed by the formulation of questions addressing objectives.

Logical Validity (Content Validity): The researcher created a questionnaire based on previous studies on social interaction and its role in promoting environmental sustainability. Some statements were derived from specific scales, while others were based on studies addressing particular aspects of social interaction. The questionnaire is acceptable, logically valid, and suitable for application.

2.7.5. Construct Validity

Correlation coefficients were calculated between the score of each dimension of the questionnaire and the overall score. This was done to determine the extent of the relationship between each dimension and the overall score of the questionnaire and to verify its validity, Table 2.

Table 2.
Correlation coefficients (CCs) between the overall score of each subscale and the total score of the questionnaire.

Field	CCs	Sig. level at
Determining the role of social interaction in promoting environmental awareness	0.589	0.01
Analyzing the impact of social factors affecting participation in environmental development	0.687	0.01
Determining the impact of values on environmental sustainability	0.786	0.01
Detection of the challenges facing environmental sustainability	0.625	0.01

It is evident from the previous table that the questionnaire dimensions exhibit substantial and statistically significant correlation coefficients at a significance level of less than 0.01. The correlation coefficients for the dimensions of the evaluation form ranged from 0.589 to 0.786, which provides strong evidence that the questionnaire has a high validity coefficient.

2.7.6. The stability of the Questionnaire

The questionnaire's stability is due to its high accuracy, mastery, and consistency in providing data about respondent behavior. A stable test yields consistent results when applied to the same individuals on two different occasions. The reliability coefficient was calculated on a 30-item sample using various methods. Among the methods used to calculate the reliability of the questionnaire are:

2.7.7. Test-Retest Method

The researcher applied a scale to 30 individuals and re-administered it to the same group three weeks later. The reliability coefficient was calculated between the scores in the first and second applications, indicating agreement between responses on each dimension of the questionnaire form with a rate of 0.889 Table 3.

Table 3.
Reliability coefficients (RCs) of the subscales and their various dimensions.

No.	Dimension	Statement No.	RCs	Sig. level at
1	Determining the role of social interaction in promoting environmental awareness	10	0.847	0.01
2	Analyzing the impact of social factors affecting participation in environmental development	10	0.782	0.01
3	Determining the impact of values on environmental sustainability	9	0.869	0.01
4	Detection of the challenges facing environmental sustainability	10	0.898	0.01
	Total	39	0.889	0.01

The table reveals a consistent reliability percentage across different dimensions, with coefficients ranging from 0.782 to 0.898, indicating statistical significance at the 0.01 level. The questionnaire's overall score also reached 0.889, indicating confidence in its validity as a research tool and a strong correlation between the reliability percentages.

2.8. Split-Half Method (S.H)

The researcher calculated reliability coefficients for each subscale of the questionnaire, correlation coefficients between subscales, and correlation coefficients between dimensions and the scale's total score using Guttman's split-half method and the Spearman-Brown coefficient.

Table 4.
Reliability coefficient of the questionnaire and its dimensions according to (Guttman Split-Half Method – Spearman-Brown).

No.	Dimension	Correlation coefficient Guttman Split	Correlation coefficient Spearman-Brown
1	Determining the role of social interaction in promoting environmental awareness	0.898	0.689
2	Analyzing the impact of social factors affecting participation in environmental development	0.768	0.712
3	Determining the impact of values on environmental sustainability	0.698	0.877
4	Detection of the challenges facing environmental sustainability	0.712	0.732
*	Correlation coefficient of dimensions with each other	0.867	0.879
*	Correlation of dimensions with the total score	0.812	0.859

The questionnaire's dimensions have reliable coefficients, with Gutman's split-half method indicating a range of 0.698 to 0.898 reliability coefficients. The Spearman-Brown correlation coefficient ranges from 0.689 to 0.877, indicating high reliability and stability. The Guttman split-half correlation coefficient and Spearman-Brown coefficient show high reliability

and stability, with 0.867 and 0.879, respectively. Overall score correlation coefficients are 0.812 and 0.859, indicating the scale's suitability.

3. Results and Discussion

The researcher relied on the hypothetical mean (HM) (2) and its relative weight (RW) (0.67). Thus, if the AM and relative weight for the field as a whole are less than the hypothetical mean and its relative weight, the field requires adjustment.

3.1. Regarding the Field of Defining the Role of Social Interaction in Promoting Environmental Awareness

The following table shows the T-value for the significance of the differences between the arithmetic means and the hypothetical mean of the respondents' estimates to determine the role of social interaction in enhancing environmental awareness.

Table 5.
AM, T-value, and HM to determine the role of social interaction in enhancing environmental awareness.

Statement No.	Neutral	Disagree	Strongly disagree	AM	SD	T-value	Sig. level	RW	Rank	Rating degree
Trust among community members is one of the key factors in enhancing sustainable environmental initiatives.	164	76	25	2.52	0.66	12.88	Sig*	84.15	4	High
Social activities help increase environmental awareness among individuals.	155	60	50	2.40	0.79	8.20	Sig*	79.87	6	High
Community participation contributes to the successful implementation of environmental sustainability projects.	134	95	36	2.37	0.71	8.46	Sig*	78.99	8	High
Collaborative work contributes to the exchange of ideas in finding innovative solutions to environmental problems.	194	30	41	2.58	0.75	12.61	Sig*	85.91	2	High
Social support provides individuals with motivation to engage in sustainability initiatives.	162	80	23	2.52	0.65	13.10	Sig*	84.15	4	High
Knowledge exchange among individuals is a key factor in achieving sustainability goals.	159	83	23	2.51	0.65	12.81	Sig*	83.77	5	High
Community events contribute to enhancing social engagement in environmental issues.	189	29	47	2.54	0.78	11.21	Sig*	84.53	3	High
Social networks play an important role in enhancing environmental awareness.	175	80	10	2.62	0.56	18.16	Sig*	87.42	1	High
Social interaction among individuals supports a sense of shared responsibility toward environmental protection.	173	58	34	2.52	0.71	11.98	Sig*	84.15	4	High
Social interaction helps find innovative solutions to the environmental challenges facing society.	138	91	36	2.38	0.71	8.77	Sig*	79.50	7	High
Field as a whole	N = 265			2.50	0.70	HM = 2		83.25	-	High

Note: * Statistically significant differences at the level 0.001.

It is clear from Table 5 that the role of social interaction in enhancing environmental awareness received a high rating. The statements in this area received ratings ranging from high to moderate. The highest-ranked statement was "Social networks play an important role in enhancing environmental awareness," which received a high rating with a mean of 2.62 and a standard deviation of 0.56. This is supported by an RW value of 87.42. Statistically significant differences were found at the 0.001 level between the mean of this statement and the hypothetical mean, in favor of the arithmetic mean, with a T value of 18.16. Ranked next, with a high rating, was the statement, "Collaborative work contributes to the exchange of ideas in finding innovative solutions to environmental problems," with a mean of 2.58 and a standard deviation of 0.75. The statement, "Social interaction helps find innovative solutions to the environmental challenges facing society," ranked last with a high rating, having a mean of 2.38 and a standard deviation of 0.71.

Therefore, social media contributes significantly to awareness, helps meet environmental requirements, supports education, and keeps up with events [27]. In addition, another study showed the effective and positive role of social media in defining the importance of the environment and promoting and spreading the culture that helps promote awareness among members of society [28]. In the same direction, these results agreed with the results of the study [29] on the effective role of communication platforms in providing environmental awareness messages.

3.2. Regarding the Analysis of the Impact of Social Factors Affecting Participation in Environmental Development

The following table shows the T-value indicating the differences between the AM and HM of the respondents' ratings, which is used to analyze the impact of social factors affecting participation in environmental development.

Table 6.
T-value, AM, and HM of the impact of the social factors affecting participation in environmental development.

Statement No.	Neutral	Disagree	Strongly disagree	AM	SD	T-value	Sig. level	RW	Rank	Rating degree
My sense of belonging to the community affects my desire to participate in environmental development projects.	159	79	27	2.50	0.67	12.01	Sig*	83.27	5	High
Individuals' communication with one another increases the opportunities for participation in environmental initiatives.	168	21	76	2.35	0.90	6.31	Sig*	78.24	8	High
Local leaders positively influence individuals' participation in environmental development.	145	86	34	2.42	0.71	9.62	Sig*	80.63	6	High
Support from my family encourages me to engage in environmental development activities.	128	73	64	2.24	0.82	4.81	Sig*	74.72	10	High
Community culture plays a role in motivating me to participate in environmental protection and sustainable development.	119	109	37	2.31	0.70	7.16	Sig*	76.98	9	High
Providing financial incentives from the community encourages me to participate in environmental development projects.	163	38	64	2.37	0.85	7.17	Sig*	79.12	7	High
Increased levels of environmental awareness in the community enhance the likelihood of my participation in environmental development activities.	178	67	20	2.60	0.63	15.48	Sig*	86.54	2	High
I believe that media campaigns influence individuals' decisions to participate in environmental projects.	158	84	23	2.51	0.65	12.72	Sig*	83.65	4	High
Social networks serve as a platform for exchanging information that motivates participation in environmental development.	190	21	54	2.51	0.81	10.28	Sig*	83.77	3	High
Demographic factors such as age, gender, and education level play a role in reducing participation in environmental development.	192	66	7	2.70	0.51	22.09	Sig*	89.94	1	High
Field as a whole	N = 265			2.45	0.73	HM =2		81.69	-	High

Note: *Statistically significant differences at the level 0.001

It is clear from Table 6 that the analysis of the impact of social factors on participation in environmental development received a high rating. While the statements in this area received ratings ranging from high to moderate, the highest-ranked statement was "Demographic factors such as age, gender, and education level play a role in reducing participation in environmental development," which received a high rating with a mean of 2.70 and a standard deviation of 0.51. This is supported by a relative weight value of 89.94. Statistically significant differences were found at the 0.001 level between the mean of this statement and the hypothetical mean, in favor of the arithmetic mean, with a T value of 22.09. The next ranked statement, also with a high rating, was "Increased levels of environmental awareness in the community enhance the likelihood of my participation in environmental development activities," with a mean of 2.60 and a standard deviation of 0.63. Following

this, the statement "Social networks serve as a platform for exchanging information that motivates participation in environmental development" has a high rating with an arithmetic mean of 2.51 and a standard deviation of 0.81. The seventh-ranked statement, with a high rating, was "Providing financial incentives from the community encourages me to participate in environmental development projects," with a mean of 2.37 and a standard deviation of 0.85. This is supported by a relative weight value of 79.12.

The results showed that demographic factors, including age, gender, and educational level, play a role in enhancing participation in environmental development, as the results of some studies indicate [30, 31] agreed that age and gender play a role in and influence effective environmental participation and sustainable environmental practices.

The study's results [30] also showed that younger people have a positive tendency and greater awareness than older people. In contrast, the results of the study [32] showed that age and gender variables do not affect environmental awareness and environmental participation. On the other hand, education plays a fundamental role in enhancing environmental sustainability and its positive impact [33].

3.3. Regarding the Field of Determining the Impact of Values on Environmental Sustainability

The following table shows the T value indicating the significance of the differences between the AM and HM for the respondents' ratings in determining the impact of values on environmental sustainability.

Table 7.
T-value, AM, and HM are used to determine the impact of values on environmental sustainability.

Statement NO.	Neutral	Disagree	Strongly disagree	AM	SD	T-value	Sig. level	RW	Rank	Rating degree
My personal values serve as a motivation for me to participate in environmental sustainability efforts.	183	51	31	2.57	0.69	13.47	Sig*	85.79	2	High
I believe that respecting nature is a fundamental value for achieving development.	148	90	27	2.46	0.67	11.04	Sig*	81.89	5	High
Values related to social justice play an important role in promoting environmental sustainability.	156	88	21	2.51	0.64	12.95	Sig*	83.65	4	High
Collective values in my community encourage collaboration on environmental sustainability projects.	186	13	66	2.45	0.87	8.52	Sig*	81.76	6	High
I believe that I have a social responsibility to protect the environment through my daily actions.	171	66	28	2.54	0.68	12.93	Sig*	84.65	3	High
Value-based learning about the environment increases individuals' awareness of the importance of sustainability.	156	61	48	2.41	0.78	8.52	Sig*	80.25	8	High
I believe that values play a crucial role in individuals' behavior toward sustainable consumption.	152	80	33	2.45	0.71	10.36	Sig*	81.64	7	High
The values of loyalty to future generations encourage me to engage in sustainable environmental initiatives.	190	28	47	2.54	0.78	11.29	Sig*	84.65	3	High
Cultural values in my community influence how the researcher addresses environmental and sustainability issues.	169	80	16	2.58	0.61	15.53	Sig*	85.91	1	High
Field as whole	N = 265			2.50	0.71	HM =2		83.35	-	High

Note: * Statistically significant differences at the level 0.001.

It is clear from Table 7 that the field of determining the impact of values on environmental sustainability received a high rating, while the statements in this field received ratings ranging from high to moderate. The highest-ranked statement was "Cultural values in my community influence how the researcher addresses environmental and sustainability issues," which received a high rating with a mean of 2.58 and a standard deviation of 0.61. This is supported by a relative weight value of 85.91. Statistically significant differences were found at the 0.001 level between the mean of this statement and the HM in favor of the AM, with a T value of 15.53. The statement "My personal values serve as a motivation for me to participate in

environmental sustainability efforts" also received a high rating, with a mean of 2.57 and a standard deviation of 0.69. The seventh-ranked statement, with a high rating, was "I believe that values play a crucial role in individuals' behavior toward sustainable consumption," with a mean of 2.45 and a standard deviation of 0.71.

With regard to the factor of the impact of values on enhancing environmental sustainability, as the results of the previous table showed, all elements of this field received a high evaluation score, which confirms the effective impact of values, principles, and cultures on environmental sustainability. Researchers [34] explained this in their research related to values, attitudes, and behaviors towards sustainability, regardless of the changes in countries and their cultures. It was also found that the environmental laws imposed by the state, to which individuals respond, play a role in the effectiveness of sustainability [35]. The values and behaviors that an individual possesses and that take a positive direction lead to a positive impact on a better and more sustainable environment [36].

3.4. Regarding the Field of Detecting the Challenges Facing Environmental Sustainability

The following table shows the value of T to indicate the differences between the AM and the HM of the respondents' ratings, revealing environmental sustainability challenges.

Table 8.
T-value, AM, and HM regarding the respondents' ratings to reveal the challenges facing environmental sustainability

Statement No.	Neutral	Disagree	Strongly disagree	AM	SD	T-value	Sig. level	RW	Rank	Rating degree
Lack of awareness and knowledge about sustainability issues.	140	101	24	2.44	0.65	10.88	Sig*	81.26	7	High
Insufficient funding for environmental initiatives.	183	32	50	2.50	0.79	10.30	Sig*	83.40	5	High
Inadequate infrastructure plays a role in hindering environmental sustainability efforts.	167	82	16	2.57	0.61	15.31	Sig*	85.66	1	High
Climate change is considered one of the biggest challenges affecting environmental sustainability in our region.	168	69	28	2.53	0.68	12.65	Sig*	84.28	3	High
Current laws and policies are considered insufficient to support environmental sustainability initiatives.	131	106	28	2.39	0.67	9.43	Sig*	79.62	9	High
Population growth increases pressure on natural resources and negatively impacts environmental sustainability.	157	89	19	2.52	0.63	13.50	Sig*	84.03	4	High
Pollution is considered one of the main challenges facing environmental sustainability.	176	57	32	2.54	0.70	12.62	Sig*	84.78	2	High
The lack of cooperation among different communities affects environmental sustainability efforts.	157	84	24	2.50	0.66	12.42	Sig*	83.40	5	High
Unsustainable economic activities lead to the depletion of natural resources.	142	98	25	2.44	0.66	10.87	Sig*	81.38	6	High
Differences in beliefs about the environment pose challenges in achieving sustainability goals.	135	105	25	2.42	0.66	10.27	Sig*	80.50	8	High
Field as a whole	N = 265			2.48	0.67	HM =2		82.83	-	High

Note: *Statistically significant differences at the level 0.001.

It is clear from Table 8 the field of revealing the challenges facing environmental sustainability received a high rating, while the statements in this field received ratings ranging from high to moderate. The highest-ranked statement was "Inadequate infrastructure plays a role in hindering environmental sustainability efforts," which received a high rating with a mean of 2.57 and a standard deviation of 0.61. The following statement, ranked with a high rating, was "Pollution is considered one of the main challenges facing environmental sustainability," which received a mean of 2.54 and a standard deviation of 0.70. Then, the statement “The lack of awareness and knowledge about sustainability issues” ranked seventh with a high level of estimation, achieving a mean score of 2.44 and a standard deviation of 0.65. This is supported by a

relative weight of 81.26. Statistically significant differences were found at the 0.001 level between the arithmetic mean of this statement and the hypothetical mean, favoring the hypothetical mean, with a T-value of 10.88.

Based on the results obtained, it was found that there are many challenges facing the environment and its sustainability. Some studies have revealed that the various activities carried out by individuals may have a negative impact on the environment. For example, global warming, pollution, improper use of some environmental elements, and the degradation of some agricultural lands. All of these challenges represent a burden on the environment and pose challenges that reduce environmental sustainability [37, 38].

Second: Results of Hypothesis Validation: This section presents the study's findings based on the questionnaire application and discusses the hypotheses' validation results.

1st hypothesis: The results of the t-test for the significance of differences between respondents in the dimensions of the social interaction scale and its role in promoting environmental sustainability attributed to the gender variable are shown in Table 9

Table 9.
T-test, AM, SD, DF and significance differences between respondents (gender variable).

Questionnaire axes	Groups	No.	AM	SD	T-value	DF	Sig.
Determining the role of social interaction in enhancing environmental awareness	Male	118	24.79	3.14	0.885	263	Not sign.
	Female	147	25.12	2.99			
Analyzing the impact of social factors affecting participation in environmental development	Male	118	24.32	2.86	0.882	263	Not sign.
	Female	147	24.65	3.18			
Determining the impact of values on environmental sustainability	Male	118	22.42	2.26	0.568	263	Not sign.
	Female	147	22.57	1.97			
Detection of challenges facing environmental sustainability	Male	118	24.59	2.62	1.450	263	Not sign.
	Female	147	25.05	2.53			

The data in Table 9 indicate the differences between respondents in the dimensions of the social interaction scale and its role in promoting environmental sustainability, which is attributed to the gender variable.

The results shown in Table 9 indicate that all the questionnaire axes attributed to gender possess t-values that ranged between 0.568 and 1.450 and are not statistically significant at the 0.05 level. Therefore, the hypothesis was rejected. The findings suggest that gender does not influence the impact of social factors on environmental sustainability.

Some studies support these results, indicating there are no significant differences related to gender variables and their effect on environmental sustainability, as both genders play an effective role in improving and enhancing the sustainable environment, and they may also have a negative impact [39]. On the contrary, another study confirmed that gender and generation have an effect on the environment and sustainability [40].

2nd Hypothesis: The results for the 2nd hypothesis are shown in Table 10.

Table 10.
One-way ANOVA analysis of the average scores of the respondents on the dimensions of the social interaction scale and its role in promoting environmental sustainability, attributed to the age variable.

Scale dimensions	Variance source	Sums of squares	Degrees of freedom	Mean Sum of Squares	F value	Sig.
Determining the role of social interaction in enhancing environmental awareness	Between-group	21.56	2	10.78	1.157	Not sign.
	Within group	2441.25	262	9.32		
	Total	2462.82	264			
Analyzing the impact of social factors affecting participation in environmental development	Between-group	28.96	2	14.48	1.577	Not sign.
	Within group	2405.28	262	9.18		
	Total	2434.24	264			
Determining the impact of values on environmental sustainability	Between-group	1.95	2	0.98	0.220	Not sign.
	Within group	1164.29	262	4.44		
	Total	1166.24	264			
Detection of challenges facing environmental sustainability	Between-group	4.10	2	2.05	0.306	Not sign.
	Within group	1751.86	262	6.69		
	Total	1755.96	264			

The results in Table 10 indicate the differences between the average scores of respondents on the social interaction scale and its role in promoting environmental sustainability based on age differences for all axes. The results indicated that there are no significant differences in all axes related to age, confirming the invalidity of this hypothesis, and the F-value for all axes ranged between 0.220 and 1.577, which are not statistically significant at a significance level of 0.05.

The results confirmed that the age variable has no role in the dimensions of the social interaction scale and its role in promoting a sustainable environment [39].

3rd Hypothesis: The results of this hypothesis shown in Table 11

Table 11.
One-way ANOVA analysis of the average scores of respondents on the dimensions of the social interaction scale and its role in promoting environmental sustainability according to differences in educational level.

Scale dimensions	Variance source	Sums of squares	Degrees of freedom	Mean Sum of Squares	F value	Sig.
Determining the role of social interaction in enhancing environmental awareness	Between-group	33.79	3	11.26	1.210	Not sign.
	Within group	2429.03	261	9.31		
	Total	2462.82	264			
Analyzing the impact of social factors affecting participation in environmental development	Between-group	54.13	3	18.04	1.979	Not sign.
	Within group	2380.11	261	9.12		
	Total	2434.24	264			
Determining the impact of values on environmental sustainability	Between-group	14.62	3	4.87	1.104	Not sign.
	Within group	1151.63	261	4.41		
	Total	1166.24	264			
Detection of challenges facing environmental sustainability	Between-group	4.56	3	1.52	0.226	Not sign.
	Within group	1751.40	261	6.71		
	Total	1755.96	264			

The results shown in Table 11 indicate the differences between the average scores of respondents on the social interaction scale and its role in promoting environmental sustainability based on educational level differences for all its axes. The results show that there are no significant differences in the average scores of respondents on the scale measuring the role of social interaction in promoting environmental awareness, which is attributed to the educational level variable. The F-value for the axes ranges from 0.226 to 1.979, confirming that it is not statistically significant at the 0.05 significance level and indicating the invalidity of the hypothesis.

4. Conclusion

In conclusion, the researchers emphasized that social interaction within Saudi society is crucial for promoting sustainable environmental development and encouraging positive behaviors that support the environment. Social interaction among members of society is essential for adopting and advancing sustainable environmental practices, as it helps balance societal needs with individuals' commitment to environmental laws and the preservation of natural resources. Furthermore, social interaction plays a vital role in addressing various challenges related to environmental sustainability, facilitating the development of appropriate solutions, and promoting environmentally friendly behaviors. It also supports making informed decisions that benefit the environment and society as a whole.

Finally, the researchers recommend holding meetings and gatherings between local individuals, which in turn shows the positive aspects followed by individuals and clarifies the shortcomings that must be addressed to preserve the environment and sustain it for these and future generations. Work to find simple procedures that contribute to sustainability, such as reducing energy consumption, using materials that can be recycled and reused, conserving water, and rationalizing its use.

Through the results obtained, it was found that positive social interaction plays a vital role in environmental sustainability. It encourages individuals to express and exchange opinions and to propose appropriate solutions to environmental problems or challenges. This process aids in the development of effective laws and policies that support environmental sustainability. Education and cooperation among local community members are essential for improving and developing the environment. Additionally, individuals contribute by supporting measures that have a significant impact on environmental preservation and sustainability.

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