An Analytical Study of the Impact of Socioeconomic Characteristics on Rural People's Environmental Awareness and Practices (A Case Study from Fayoum Governorate, Egypt)

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Abstract **:**Rural communities in Egypt face escalating challenges of environmental degradation and declining environmental consciousness, which adversely impact quality of life and sustainable development. Recognizing environmental awareness as a cornerstone for fostering pro-environmental behavior, this study aimed to assess the levels of awareness and prevailing environmental practices among rural residents in the Fayoum and Itsa districts of Fayoum Governorate. The research also sought to identify the socioeconomic factors influencing these behaviors and to examine the relationship between awareness and practice. Employing a descriptive survey methodology, data were collected from a field-based sample of rural households using structured questionnaires. Statistical analysis involved descriptive statistics and Pearson correlation coefficients. The findings revealed a moderate overall level of environmental awareness among respondents, with a significant disparity favoring the Fayoum district. Correspondingly, pro-environmental behaviors were more prevalent in Fayoum, whereas negative practices were more common in Itsa. Statistically significant correlations were found between environmental awareness and key independent variables, including educational level, occupation, and landholding size. Crucially, the study confirms the direct, positive influence of awareness on pro-environmental behavior, highlighting its role in mitigating harmful practices. These results underscore the imperative to invest in targeted environmental education and agricultural extension programs as effective mechanisms for driving behavioral change and advancing sustainability in rural contexts.

Keywords: Environmental Awareness - Rural Practices - Environmental Behavior Environmental Sustainability - Environmental Extension

I. INTRODUCTION

Environmental issues are among the most pressing challenges currently facing Egyptian society due to their direct and indirect effects on the trajectory of economic and social development. This challenge is further complicated by rapid urban expansion, significant technological advancement, and excessive use of chemical inputs such as pesticides and fertilizers. These factors have disrupted the ecological balance and led to the accumulation of pollutants.

The environment encompasses all elements surrounding human life, including natural components such as air, water, and soil, as well as urban elements like buildings and infrastructure. The interaction between humans and the environment is reciprocal: people cultivate land when water and fertile soil are available, and they also exploit environmental resources to meet their needs.

Human behavior in dealing with the surrounding environment is influenced by their abilities and is shaped by their economic and social conditions, as well as cultural factors within their living environment. Concerning environmental protection, an individual's behavior is considered sound when it aligns with the state's directives to preserve and protect the environment, ensuring its sustainability for future generations, commonly referred to as sustainable environmental development.

Research Problem:

The research problem lies in the increasing severity of environmental issues facing Egyptian society, much of which is attributed to unsound human practices, especially in rural areas. This reality raises a fundamental question: To what extent are individuals' environmental awareness and behavior

influenced by their socioeconomic characteristics? This relationship remains underexplored in the local literature, creating a knowledge gap that warrants further investigation and analysis.

Research Objectives:

The study aims to examine the level of environmental awareness and practices among rural populations through the following specific objectives:

1- To analyze the socioeconomic characteristics of the study sample.
2- To measure the level of both positive and negative environmental practices among the respondents.
3- To examine the relationship between the respondents' orientation toward agricultural extension services in raising environmental awareness and selected independent variables.
4- To explore the relationship between environmental awareness and selected socioeconomic variables.
5- To identify the most significant socioeconomic characteristics influencing respondents' engagement in both positive and negative environmental practices. This would aid policymakers in the rural and environmental sectors in designing and managing more suitable extension and training programs, particularly for farmers, based on their knowledge levels, behaviors, and socioeconomic profiles.

II. METHODOLOGY

The study adopts a descriptive analytical approach to explore the relationships among the variables under investigation. Primary data were collected using a structured questionnaire administered through personal interviews. A simple random sample of 60 respondents was selected (30 from each of Fayoum and Itsa districts), chosen due to their high population density—rural residents constitute more than 77% of the governorate's total population. The selection of these two districts was based on criteria of geographical representation and population size, with population figures in 2023 estimated at approximately 906,925 and 797,962, respectively.

Measurement of Study Variables:

Before presenting the research findings, it is important to explain how the key study variables were measured:

A. Dependent Variables:

The study included two dependent variables:

- Degree of engagement in positive environmental behaviors

This was measured using 20 questions related to environmentally friendly practices.

- Degree of engagement in negative environmental behaviors

This was measured using 20 questions focusing on environmentally harmful practices.

Respondents answered each question with "Yes" or "No." Numerical values were assigned as follows: "1" for "Yes" and "0" for "No." The total score for each respondent was calculated by summing their responses, providing a numerical index of engagement in both positive and negative practices.

B. Independent Variables:

The following socioeconomic and demographic variables were used as independent variables:

1- **Age**: Measured in completed years at the time of data collection.
2- **Occupation**: Respondents were asked whether they worked exclusively as farmers or held additional occupations. Responses were coded as: Farmer only (1), Farmer with another job (2).
3- **Educational** level: Coded as follows: Illiterate (1), Literate without formal qualifications (2), Intermediate education (3), Higher education (4).
4- **Landholding size**: Measured as the total agricultural land area owned by the respondent.
5- **Household size:** Measured as the number of individuals residing in the household.
6- **Housing condition**: Assessed through 11 items with binary responses (Yes = 1, No = 0) or Likert-type scales ranging from 1 to 3. The aggregate score served as a composite index.
7- **Orientation toward agricultural extension**: Measured using seven statements related to respondents' perceptions of the roles and benefits of agricultural extension services, knowledge of extension agents, and participation in extension activities. A 3-point Likert scale

was used (Agree = 3, Neutral = 2, Disagree = 1), with reverse coding applied to negatively worded items.

8- **Crop diversification**: Respondents were asked about the variety of crops grown (e.g., vegetables, grains, fiber crops). Scores were assigned as follows: More than four types (3), 3–4 types (2), Two or fewer types (1).

9- **Environmental awareness level**: Measured using 15 items that assessed knowledge of environmentally sound practices. Responses were rated as: Good (3), Moderate (2), Poor (1). The cumulative score represented a numerical index of environmental awareness.

III. RESULTS

Objective 1: Identifying the Socioeconomic Characteristics of the Respondents in the Study Sample:

The socioeconomic characteristics of rural inhabitants represent a critical factor in enhancing their participation in rural development. This section presents the field research findings collected from a sample of respondents in the Fayoum and Itsa districts, as shown in Table 1. The key results are as follows:

1. Age Distribution of Respondents

The results indicate that the majority of respondents fall within the age group of 41–60 years, accounting for approximately 73.3% and 50% of respondents in Fayoum and Itsa, respectively. This is followed by the age group over 60 years, representing 16.7% and 33.3% of respondents in the two districts, respectively. These findings suggest that the largest proportion of the total sample lies within the middle-age bracket—considered the economically active age—comprising approximately 61.7% of all respondents.

2. Occupation

The findings show that around 86.7% and 83.3% of respondents in Fayoum and Itsa, respectively, are exclusively engaged in agriculture. This indicates that more than 85% of the total respondents rely on farming as their primary source of livelihood, with no alternative income sources. Such dependence on the environment for subsistence may significantly influence their environmental awareness.

3. Educational Status

The results reveal that approximately 46.7% of respondents in Fayoum hold an intermediate educational qualification, while 76.7% of respondents in Itsa are literate but without formal qualifications. Moreover, the proportion of respondents with higher education is relatively low across the total sample, accounting for only 5%.

4. Landholding Size

The data indicate that around 53.3% and 50% of respondents in Fayoum and Itsa, respectively, own less than one feddan of agricultural land. Furthermore, about 33.3% and 23.3% of respondents in the respective districts own more than two feddans.

5. Household Size

The results show that about 66.7% of respondents in Fayoum have households consisting of 5 to 7 members, while approximately 86% of respondents in Itsa have households with more than 7 members.

6. Housing Conditions

According to the findings, around 53.3% and 26.7% of respondents in Fayoum and Itsa, respectively, reported having good housing conditions. In contrast, about 33.3% and 66.7% of respondents in the respective districts reported having average housing conditions.

Table 1: Distribution of Respondents According to Their Socioeconomic Characteristics:

Variable	Fayoum Center		Itsa Center		Total Sample	
	Frequency	%	Frequency	%	Frequency	%
1. Age Structure						
40 years or below	3	10.0	5	16.7	9	15.0
41–60 years	22	73.3	15	50.0	37	61.7
Above 60 years	5	16.7	10	33.3	14	23.3
2. Occupation						
Farmer	26	86.7	25	83.3	51	85.0
Farmer with other job	4	13.3	5	16.7	9	15.0
3. Educational Level						
Illiterate	5	16.7	4	13.3	9	15.0
Literate	8	26.7	23	76.7	31	51.7
Intermediate degree	14	46.7	3	10.0	17	28.3
University degree	3	10.0	0	0.0	3	5.0
4. Landholding Size						
Less than 1 feddan	16	53.3	15	50.0	31	51.7
1–2 feddans	4	13.3	8	26.7	12	20.0
More than 2 feddans	10	33.3	7	23.3	17	28.3
5. Household Size						
Less than 5 members	2	6.7	4	13.3	6	10.0
5–7 members	20	66.7	0	0.0	20	33.3
More than 7 members	8	26.7	26	86.7	34	56.7
6. Housing Condition						
Good	16	53.3	8	26.7	24	40.0
Average	10	33.3	20	66.7	30	50.0
Poor	4	13.3	2	6.7	6	10.0
7. Environmental Awareness						
Good	13	43.3	6	20.0	19	31.7
Moderate	8	26.7	11	36.7	19	31.7
Weak	9	30.0	13	43.3	23	38.3
8. Attitude Toward Agricultural Extension						
Positive	5	16.7	5	16.7	10	16.7
Moderate	14	46.7	4	13.3	18	30.0
Weak	11	36.7	21	70.0	32	53.3

Source: Compiled and calculated from the field survey sample

7. Environmental Awareness

The results reveal a noticeable variation in environmental awareness levels between respondents in Fayoum and Itsa centers. In the "high awareness" category, 43.3% of respondents in Fayoum fell into this group, compared to only 20% in Itsa. Conversely, 30% of respondents in Fayoum exhibited "low awareness," while the proportion rose to 43.3% in Itsa. For the "moderate awareness" category, 26.7% of respondents in Fayoum and 36.7% in Itsa were recorded. These findings indicate a higher level of environmental awareness among respondents in Fayoum compared to those in Itsa.

8. Attitude Toward Agricultural Extension

The findings indicate that approximately 46.7% of respondents in Fayoum exhibited a moderate attitude toward agricultural extension, while only 13.3% of respondents in Itsa reported the same. Moreover, about 70% of respondents in Itsa demonstrated a weak attitude toward agricultural extension services, highlighting a significant gap in engagement with agricultural advisory programs in this district.

Summary of Key Findings:

- Age Distribution: The majority of respondents fall within the 41–60 age group, reflecting a concentration in the economically active labor force.
- Occupation: Most respondents rely on agriculture as their sole source of income.
- Education: Educational levels vary between districts, with a generally low representation of higher education qualifications.
- Landholding Size: More than half of the respondents own less than one feddan of land.
- Household Size: Households in Itsa tend to be larger than those in Fayoum
- Housing Condition: A higher proportion of medium-quality housing is found in Itsa.
- Environmental Awareness: Respondents in Fayoum exhibit higher levels of awareness compared to those in Itsa.
- Agricultural Extension: There is a critical need to enhance extension services, particularly in Itsa, where attitudes toward extension were predominantly weak

Objective 2: Degree of Engagement in Positive and Negative Environmental Practices:

This section of the study focuses on identifying the extent to which respondents engage in both positive and negative environmental practices. To assess this, the study employed twenty items to measure positive environmental behaviors and another twenty items to measure negative environmental behaviors. The total score for each respondent was calculated using the algebraic sum of their responses in both districts (Fayoum and Itsa), serving as a numerical index of their environmental behavior.

To achieve this objective, the Mann-Whitney and Wilcoxon statistical tests were used to examine the differences in the degree of engagement in both positive and negative practices among the respondents.

1. **Significance of Differences in Positive Environmental Practices Between Fayoum and Itsa**

The first null hypothesis assumed that:

"There is no significant difference in the degree of positive environmental practices between respondents in Fayoum and Itsa."

To test the validity of this hypothesis, the Mann-Whitney U test was applied to compare the means of two independent samples. The calculated Z-value was 3.28 (see Table 2), which is statistically significant at the 5% level. This result leads to the rejection of the null hypothesis and confirms that there is a statistically significant difference in the degree of positive environmental practices between respondents in the two districts.

Table 2: Significance Tests for Differences in Respondents' Engagement in Positive and Negative Environmental Practices:

Variable	Mann-Whitney	Wilcoxon	Z	Sig.
The degree of engagement in **positive environmental practices** between the two districts	243.2	699	3.28	0.001
The degree of engagement in **negative environmental practices** between the two districts	221.0	686	3.45	0.001
Degree of engagement in **positive vs. negative practices** in Fayoum center	63.5	528	5.792	0.000
Degree of engagement in **positive vs. negative practices** in Itsa center	17.5	482.5	6.45	0.000

Source: Compiled and calculated from the field survey sample

2. **Significance of Differences in Negative Environmental Practices Between Fayoum and Itsa**

The second null hypothesis posited that:

"There is no significant difference in the degree of negative environmental practices between respondents in Fayoum and Itsa."

To test this, the previously mentioned statistical method was applied. The calculated Z-value was 3.5, which is statistically significant at the 5% level. Therefore, the null hypothesis is rejected, indicating

that there is a statistically significant difference in the level of negative environmental practices between the two districts.

3. **Significance of Differences Between Positive and Negative Environmental Practices within Fayoum**

The third null hypothesis assumed that:

"There is no significant difference between the levels of positive and negative environmental practices among respondents in Fayoum."

Using the Wilcoxon signed-rank test, the calculated Z-value was -5.7, which is statistically significant at the 5% level. This result leads to rejecting the null hypothesis, confirming that there is a significant difference between the levels of positive and negative practices within Fayoum district.

4. Significance of Differences Between Positive and Negative Environmental Practices within Itsa

The fourth null hypothesis proposed that:

"There is no significant difference between the levels of positive and negative environmental practices among respondents in Itsa."

The analysis yielded a Z-value of -6.5, which is statistically significant at the 5% level. This result also leads to rejecting the null hypothesis, confirming that there is a significant difference between positive and negative environmental practices within the Itsa district.

Conclusion of Hypothesis Testing:

1. **Based on the preceding analyses, the following conclusions can be drawn:**

There are statistically significant differences in positive environmental practices between Fayoum and Itsa.

There are statistically significant differences in negative environmental practices between Fayoum and Itsa.

Within each district (Fayoum and Itsa), there are also significant differences between the levels of positive and negative environmental behaviors among respondents.

Distribution of Respondents According to Their Levels of Engagement in Positive and Negative Environmental Practices

To assess the level of engagement in both positive and negative environmental behaviors among the study sample, respondents were classified into three equal-length categories arranged in ascending order: Low, Moderate, and High. This classification was based on their total scores in environmental behavior indices—both positive and negative—for each of the two districts. The stratification was deemed necessary given the previously observed statistically significant differences between Fayoum and Itsa.

As shown in Table 3, approximately 70% of respondents in Fayoum and 33% in Itsa were categorized in the high level of positive environmental practices, indicating relatively stronger engagement in eco-friendly behaviors in Fayoum. Conversely, about 40% of respondents in both districts fell into the moderate level of negative practices, suggesting a substantial margin for improvement in curbing environmentally harmful behaviors. These findings emphasize the potential for targeted environmental awareness and extension interventions.

Objective 3: Examining the Relationship Between Attitudes Toward Agricultural Extension and Selected Independent Variables

To explore this relationship, the study tested the following null hypothesis:

"There is no statistically significant relationship between the degree of respondents' attitude toward agricultural extension in the field of rural environmental awareness and each of the following independent variables: age, educational status, occupation, household size, landholding size, crop diversity, housing condition, and environmental awareness."

To verify this hypothesis, Pearson's simple correlation coefficient was used to analyze the association between the respondents' attitudes toward extension and the aforementioned variables in both Fayoum and Itsa districts. The results, as presented in Table 4, indicated the following:

In Fayoum, the attitude toward extension showed a positive and statistically significant relationship at the 0.01 level with educational status, housing condition, and environmental awareness. This suggests that a higher level of education enhances individuals' openness to environmental issues and receptiveness to extension messages. Similarly, the positive association with housing condition reflects the role of better economic and living standards in shaping environmentally responsible attitudes.

Table3: Distribution of Respondents According to the Index of Engagement in Positive and Negative Environmental Practices

Behavior Category	Fayoum Center			Itsa Center			Total Sample		
%	Low	Moderate	High	Low	Moderate	High	Low	Moderate	High
Engagement in Positive Practices	6	3	21	11	9	10	17	12	31
%	20%	10%	70%	37%	30%	33%	28%	20%	52%
Engagement in Negative Practices	10	12	8	11	12	7	21	24	15
%	33.3%	40%	26.7%	36.7%	40%	23.3%	35%	40%	25%

Source: Compiled and calculated from the field survey sample.

A positive and statistically significant relationship at the 0.05 level was also found with occupation. Conversely, a negative and statistically significant relationship at the 0.01 level was observed with household size, possibly due to the increased burdens and responsibilities associated with larger families, which may reduce their engagement with extension activities.

No statistically significant associations were found with age, landholding size, or crop diversity in Fayoum.

In contrast, the results for Itsa revealed that attitudes toward extension were positively and significantly associated at the 0.01 level with only two variables: age and landholding size.

This may suggest that older individuals, with broader experiential knowledge of environmental challenges, are more receptive to extension programs. Additionally, farmers with larger holdings might be more aware of the economic risks associated with environmental degradation, thereby demonstrating greater interest in extension services

Based on the above findings, the null hypothesis is rejected and the alternative hypothesis is accepted, indicating the existence of significant relationships between the attitude toward extension and various independent variables, as follows:

- In Fayoum, Statistically significant relationships exist with all variables except age and crop diversity, supporting the null hypothesis only for these two.

- In Itsa: Statistically significant relationships exist only with age and landholding size, thereby confirming the null hypothesis for all other variables.

Objective 4: Examining the Relationship Between Environmental Awareness and Selected Socioeconomic Variables:

To explore the relationship between respondents' level of environmental awareness and a set of independent variables, the study tested the following null hypothesis:

"There is no statistically significant relationship between the degree of environmental awareness and each of the following independent variables: age, educational level, occupation, household size, landholding size, crop diversity, housing condition, and attitude toward agricultural extension."

To test this hypothesis, Pearson's correlation coefficient was used. The findings, as presented in Table 4, are summarized as follows:

1. **Findings in Fayoum District**

The analysis revealed the following significant relationships:

At the 0.01 significance level, there were positive and statistically significant correlations between environmental awareness and:

Educational level: This highlights the crucial role of education in enhancing awareness of environmental issues. The result aligns with previous literature suggesting that education improves individuals' ability to understand and address environmental risks using informed and scientific approaches.

Occupation: Suggesting that job type, particularly if related to agriculture or the environment, can influence how individuals perceive environmental hazards.

At the 0.05 significance level, environmental awareness was also positively and significantly associated with:

Attitude toward extension services: This reflects the effectiveness of agricultural extension as a key source of environmental information.

Housing condition: Better housing conditions likely indicate improved economic and social status, which may foster greater concern for environmental protection.

On the other hand, no statistically significant relationships were found with the following variables in Fayoum: age, household size, landholding size, and crop diversity.

2. **Findings in Itsa District**

In contrast, the results from Itsa showed positive and significant relationships at the 0.01 level between environmental awareness and the following variables:

Household size: This may reflect the increased environmental concerns within larger households, likely due to heightened pressure on domestic resources and the need for better resource management.

Landholding size: Farmers with larger landholdings may be more environmentally aware, possibly due to their heightened interest in maintaining soil productivity and land sustainability.

No significant correlations were observed between environmental awareness and the other variables in Itsa, including age, educational level, occupation, crop diversity, housing condition, and attitude toward extension.

Table 4 : Correlation Coefficients Between Attitude Toward Extension and Environmental Awareness and Independent Variables in Fayoum and Itsa

Variable	Fayoum – Extension	Fayoum – Awareness	Itsa – Extension	Itsa – Awareness
Age	0.272	0.309	0.379*	0.005
Educational level	0.407*	0.236*	0.333	0.222
Occupation	0.622**	0.421*	0.202	0.208
Household size	-0.550*	-0.251	-0.347	0.455*
Landholding size	0.447*	0.341	0.443*	0.420*
Crop diversity	0.401	0.110	0.203	0.103
Housing condition	0.579*	0.492**	0.266	0.66
Attitude toward extension	1.000	0.492**	1.000	0.507
Environmental awareness	0.492*	1.000	0.507**	1.000

Note: * Significant at the 0.05 level; **Significant at the 0.01 level*

Source: Compiled and calculated from the field survey sample

Based on the results, the null hypothesis is rejected in favor of the alternative hypothesis, which asserts that significant relationships exist between environmental awareness and selected independent variables, as follows:

- In Fayoum, significant associations were found with educational level, occupation, attitude toward extension, and housing condition.
- In Itsa, significant relationships were observed with household size and landholding size.
- No significant relationships were detected with the remaining variables in either district.

Objective 5: Identifying the Socioeconomic Factors Influencing Respondents' Engagement in Positive and Negative Environmental Behaviors

To achieve this objective, the study employed Pearson's correlation coefficient to test the statistical hypotheses and determine the key socioeconomic variables influencing both positive and negative environmental practices.

According to the results presented in Table 5, the following statistically significant relationships were found:

Findings in Fayoum District

For positive environmental behavior, the null hypothesis was rejected in favor of the alternative for the following four variables:

Educational level (r = 0.418**): A significant positive correlation at the 0.01 level, highlighting the role of education in fostering pro-environmental behavior.

Occupation (r = -0.670*): A significant negative correlation at the 0.05 level, suggesting that certain types of work may be associated with lower levels of positive environmental behavior.

Household size (r = -0.475*): A significant negative correlation at the 0.05 level, possibly reflecting the resource management challenges in larger households.

Environmental awareness (r = 0.559*): A significant positive correlation at the 0.05 level, indicating the importance of environmental knowledge in motivating positive behavior.

For negative environmental behavior, significant relationships were found with:

Occupation (r = 0.525**): A significant positive correlation at the 0.01 level, suggesting that certain occupations may be linked to environmentally harmful behaviors.

Household size (r = 0.606**): A strong positive correlation at the 0.01 level.

Environmental awareness (r = 0.439*): A positive and significant correlation at the 0.05 level, indicating the complexity of the relationship between awareness and practice in some contexts.

Findings in Itsa District

For positive environmental behavior, the null hypothesis was rejected for the following variables:

Age (r = -0.68*): A significant negative correlation at the 0.05 level, indicating that younger individuals tend to engage more in pro-environmental behaviors.

Landholding size (r = -0.40*): A significant negative correlation at the 0.05 level, possibly reflecting operational and economic pressures among those with larger holdings.

Crop diversity (r = -0.537*): A significant negative correlation at the 0.05 level.

Attitude toward extension (r = 0.414*): A significant positive correlation at the 0.05 level, confirming the role of agricultural extension in promoting environmental practices.

For negative environmental behavior, significant negative relationships were found with:

Educational level (r = -0.279*): A significant negative correlation at the 0.05 level, suggesting that higher education is associated with reduced negative environmental behavior.

Attitude toward extension (r = -0.274*): A significant negative correlation at the 0.05 level.

Environmental awareness (r = -0.64**): A strong negative correlation at the 0.01 level, reinforcing the idea that higher environmental awareness contributes to reducing harmful behaviors.

Table 5: Pearson Correlation Results for Independent Variables and Environmental Behavior (Positive and Negative)

Variable	Fayoum – Positive	Fayoum – Negative	Itsa – Positive	Itsa – Negative
Age	0.089 (NS)	0.181 (NS)	-0.68*	-0.098 (NS)
Educational level	0.418**	0.73 (NS)	0.31 (NS)	-0.279*
Occupation	-0.670*	0.525**	0.244 (NS)	0.04 (NS)
Household size	-0.475*	0.606**	-0.115 (NS)	0.11 (NS)
Landholding size	0.292 (NS)	-0.29 (NS)	-0.40*	0.153 (NS)
Crop diversity	0.203 (NS)	0.13 (NS)	-0.537*	1.630 (NS)
Housing condition	0.135 (NS)	0.34 (NS)	-0.002 (NS)	0.076 (NS)
Attitude to extension	0.028 (NS)	-0.386 (NS)	0.414*	-0.274*
Environmental awareness	0.559*	0.439*	0.315 (NS)	-0.64**

*p < 0.05, **p < 0.01; NS = Not Significant

Source: Compiled and calculated from the field survey data

- In Fayoum, educational level, occupation, household size, and environmental awareness significantly influenced positive behavior, while occupation, household size, and awareness affected negative behavior.
- In Itsa, age, landholding size, crop diversity, and attitude toward extension influenced positive behavior, while educational level, attitude toward extension, and environmental awareness influenced negative behavior.

Recommendations:

In light of the study's findings, the following recommendations are proposed:

1- Enhance environmental awareness programs targeting rural populations, with a particular focus on individuals with lower educational attainment and those employed in agriculture or related service sectors, given their demonstrated influence on awareness levels.
2- Strengthen agricultural and environmental extension services as effective platforms for disseminating environmentally sound practices. This includes updating extension content to address current environmental issues and expanding outreach channels to farmers and rural households.
3- Integrate environmental considerations into local development policies, especially in agricultural and rural projects, to ensure resource sustainability and improve the rural environmental landscape.
4- Promote environmental awareness within large households, which were found to be negatively associated with positive environmental behaviors, through targeted campaigns that address all age groups within the household.
5- Encourage environmentally responsible crop diversification, as the study found associations between landholding size, crop diversity, and environmental behavior. Extension efforts should guide farmers toward more sustainable agricultural practices.
6- Activate the role of civil society organizations and local institutions in designing and implementing participatory environmental initiatives that foster a sense of collective responsibility among rural residents.
7- Utilize the study's findings to design tailored policy interventions and awareness programs, taking into account the demographic and socioeconomic differences between various rural areas.

V. REFERENCES

- Suleiman, A. M. S. (1998). Farmers' Perception of Agricultural Environmental Problems in Selected Villages of Qalyubia and Giza Governorates. Journal of the Scientific Association for Agricultural Extension, Issue 2, Cairo.
- Ali, M. M. (2000). An Analytical Study of the Impact of Field Behaviors and Practices of a Sample of Farmers on the Conservation of Irrigation Water and Agricultural Soil (Doctoral dissertation, Institute of Environmental Studies and Research, Ain Shams University).
- Azab, W. A. (2005). An Economic Study of the Environmental Impacts on Agricultural Development (Master's thesis, Department of Agricultural Economics, Faculty of Agriculture, Al-Azhar University).
- Abdel-Aziz, Y. (1997). The Negative Effects of Pollution on the Use of Water Resources. In: Conference on the Role of Agricultural Extension in Rationalizing Irrigation Water Use in the Old Valley Lands, Scientific Association for Agricultural Extension, Cairo.
- El-Fouly, M. M. (1990). Environment and Environmental Awareness. National Research Centre in cooperation with Goethe Institute, Giza