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KNOWLEDGE OF RURAL WOMEN IN NINEVEH TOWARDS CRISIS MANAGEMENT ENVIRONMENTAL AND ITS RELATIONSHIP WITH SOME VARIABLES

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ABSTRACT

The research aimed to identify the level of knowledge for rural women in reducing environmental crises in Nineveh governorate/ Hamdaniya district, and to determine the correlation between the level of rural women's knowledge in reducing environmental crises with the following independent variables (Age, level of education. Matrimonial Status, Size of Farm Tenure, Participation in Environmental Activities) The comprehensive research was made up of 338 rural women. Data was collected using the questionnaire form for the Hamdaniya district. The Alpha Crow Vegan equation extracted the constant with a survey sample of 30 researchers; the constant was 0.87. After this, data was collected, emptied, and analysed through the Spss programme. The results showed that rural women's knowledge of environmental crisis reduction was moderate and tended to decrease. And also, As to the order of the paragraphs according to their importance, the paragraph (non-dumping of waste in agricultural land) ranked first with an average arithmetic of 0.97 also the results showed the correlation was created Among rural women's knowledge level to reducing environmental crises with a range of independent variables studied, the results shows a correlation between (age, level of education, participation in environmental activities), therefore, the researcher recommends that programmes and efforts aimed at conducting pro-environmental behavioural changes should be intensified and provided with knowledge Encourage them to participate in rural local organizations and contact agricultural extension workers to help them develop their capacities.

INTRODUCTION

Rural women are considered a fundamental pillar in the agricultural development and an active partner in agricultural production (Aye, 2020), representing half of the rural population. Some perspectives emphasize that no development plan can achieve its goals without the participation of women alongside men, as they constitute half of the human resources in society Especially in low-income countries where agriculture constitutes a large part of the local output (Kandemir and Kutlar, 2024), women make up the majority of the agricultural labor force Developing the human workforce in the agricultural sector, especially rural women (Al-Mousawi *et al.,* 2025), is considered a fundamental pillar for achieving agricultural development due to the vital role women play in various agricultural activities (Othman and Kakey, 2021) Development is no longer seen as merely achieving economic and social progress; rather, environmental preservation has become a fundamental pillar of the development process

Moreover, protecting the environment has emerged as one of the key challenges facing developing countries when planning for comprehensive development (Qadirand Azeez, 2020) The environment has been one of the fundamental issues that have concerned humans since their existence on Earth (Othman, and Kakey, 2020), as it represents the surrounding space in which they live and the source from which they derive the essentials of life and survival (Jalalian, 2022) The environment can therefore be regarded as the issue of this era. Every age has a self-imposed and mindful issue (Mohame, 2018). The issue of this age is the environment (Qadirand Azeez, 2020). This is due to the deterioration of environmental conditions in many parts of the world to such an extent that it becomes invalid for the lives of various species of living organisms and) (Eid, 2021), has its effects on the health and safety of humans, animals and plants Despite significant progress in the areas of human activity, including agriculture, there is a general concern among those interested in environmental issues, as a result of the misuse of natural resources (Othman and Kakey, 2020) Over the past years, many States have experienced a range of crises, including floods, hurricanes, earthquakes, droughts, frost and severe heatwaves, (Yücel Kandemir and Kutlar, 2024) all of which are natural and human-related Environmental pollution crises of various kinds, such as water, air and soil, are man-made and cause great damage to him and threaten his health and resources. (Al-Tamimiand Al-Badri, 2023).

As a result, environmental crises involving all components of the environment of water, air and soil have become a general phenomenon felt both in urban and rural areas (Máthur *et al*., 2023) where rural environments such as urban environments have been exposed to environmental crises (Mishra and Rath, 2023).

Where rural society cannot be isolated from urban society The rural population is affected and affected by environmental crises resulting from the wrong behavioral patterns practiced by rural populations towards their environment (Nyahunda and Tirivangasi, 2022), which are in turn due to lack of knowledge and lack of understanding of the components and elements of the environment and their interrelationships (Hasan, 2021). This is the bulldozing, burial and conversion of agricultural land. and cultivating their glorious crops. Deep tillage weakens their fertility and overuse of irrigation water. Agricultural fertilizer as well as logging, misuse and pollution of irrigation water (Adrees and midhas 2019). Also increased loss of drinking water, poor disposal and dumping of agricultural and household waste in the water stream Use of traditional sources (plant and animal waste) in energy production (Sultan, 2020) filling of air with smoke, increasing and burning field waste and inability to utilize it It is not only men who are responsible for the problems and crises of the rural environment, but also rural women who are considered to be the nucleus of the family, so they have a great responsibility to spread environmental awareness in their children in order to be able to cope with pollution (Al-Baghdadi *et al*., 2019), as rural women are considered to be more environmentally connected than urban women owing to women's significant participation in work and agricultural production which makes it in constant and continuous contact with the environment and its components, as well as the intensity of its contributions in various areas of rural life Rural women play a significant role in dealing with limited environmental resources) as they may be one

of the most important factors leading to environmental degradation (Qader and Shekha, 2023), with rural women relying on resources that are co-owned to obtain firewood, feed and food Thus, the excessive use of these resources poses a serious threat to rural livelihoods and the depletion of natural resources Or women may be the most important elements that preserve and protect the environment and separate the work that happens so that the environment is restored to restore their health as a result of human actions.

The Agricultural Extension Agency bears the brunt of protecting and maintaining the rural environment and developing its resources because it is one of the development organs that is concerned with rural development (Masso,2021). to add to that, contributes to the advancement of the countryside as the main engine for the development of the behavioral capacities of the rural woman to accommodate the requirements of preserving the components of the rural environment Not to be wasted, to maximize its use and to make a positive and effective contribution to protecting the environment and preserving it from crises in all ways based on scientific foundations for achieving the desired development. Raising the efficiency of the human component is the fundamental essence of any development in the countryside (Nyahunda and Tirivangasi, 2022).

When agricultural extension attempts to study environmental crises, it must examine the main causes that may lead to crises, thus focusing on treatment. Successful crisis management starts with planning, dividing the plan into phases and moving smoothly from pre-crisis to start-up to confrontation. Identify activities for implementing each phase to develop indicative programs that correspond to the actual environmental realities of the society in question, through which desirable behavioral changes can be made towards protecting the rural environment from environmental crises..

From this point of view, the need to undertake this research on rural women has arisen, and the research problem has therefore evolved into the following questions:

1. When the environment is in a particular crisis, how do rural women behave to address it?
2. What are the characteristics of women able to deal with these crises?

Answering previous questions may clarify rural women's knowledge of reducing environmental crises and some associated variables. In addition, there is a clear shortage of studies on rural women's knowledge levels associated with the activities studied in Nineveh/ Hamdaniya governorate so that their educational and training needs in this vital area can be met.

Research Objectives

1. To determine the level of Knowledge for Rural Women to Reduce Environmental Crises in Nineveh Governorate/Hamdaniya District
2. To Arranging rural women's knowledge paragraphs for reduce environmental crises according to their relative importance.
3. To determine the correlation between rural women's knowledge to reduce environmental crises and each of the independent variables (age, level of education, marital status, size of agricultural tenure, participation in environmental activities

MATERIALS AND METHODS

The research covered all rural women officially registered in the Directorate of Nineveh Agriculture in the Hamdaniya District and its adult districts, where, according to the books received from the Directorate of Nineveh Agriculture, 382 rural women were covered. 30 women were excluded to measure the consistency of the questionnaire, and some questionnaire forms were neglected because their information was incomplete. Thus, the research was made up of (338) rural women spread across the Hamadiyah, Nimrod and Bartala districts.

Research Tools

To achieve the research objectives, the researcher prepared a questionnaire form consisting of two parts

The identification included a set of independent variables specific to rural women in the Hamadiyah district and its subdivisions. The variables included a set of questions to measure personal characteristics (age, educational level, size of farm tenure, participation in environmental activities, measured as follows:

1. Age: This variable was measured by the years discussed during the data collection period.
2. Level of education: means formal education received by the researcher, and this variable is measured by giving 6 categories of answers**:**
   Mom, read and write, elementary, numerical, secondary, university and more and she was given digital codes (1,2,3,4,5, 6) respectively
3. Matrimonial status: The researcher was asked about her marital status, and the answers were given digital codes: single = 1, married = 2, widow = 3, divorced = 4
4. The size of agricultural tenure means the agricultural land cultivated by the researcher and engaged in farming activity at the time of the study**.**
5. Participation in environmental activities: means the degree of research's participation in some activities

for the preservation of the environment, including (the afforestation of some streets in the village or in front of Manzaz for, clean streets)

The village, participating in some hygiene campaigns in the village, attending seminars on how to keep. The environment measured this variable by allocating (8) of the paragraphs. Answers were given digital values for alternatives: (3) to always participate, (2) to sometimes participate, and (1) to participate rarely. The total score indicates the degree of participation of women researchers in environmental activities. Thus, the theoretical range ranged from (8-24)

Part II includes measuring rural women's knowledge level in reducing environmental crises It means the extent of rural women's knowledge that limits environmental crises, where paragraphs (21) have been identified. The categories of answer were:(yes and no) and scores (1) were given if yes and (0) if no.

Validity and reliability

A random reconnaissance sample consisting of 30 rural women distributed in the Hamadiyah district and its districts was selected and the reconnaissance sample was excluded from the basic research sample. The survey sample data was collected through the questionnaire form by interviewing rural women for the purpose of

ascertaining the apparent truthfulness and authenticity of the content in its preliminary form, the questionnaire form was presented to agricultural extension experts at the Faculty of Agriculture and Forestry at Mosul University and at the Department of Agricultural Extension and Rural Development at Baghdad University The measure as initially drafted is from (21) a paragraph. To measure relibility, the preliminary test of the questionnaire form was conducted on a sample of (30) rural women who were excluded from the basic research coverage where they were taken randomly from the research community, the preliminary test data were analyses statistically using the VAC equation and the constant factor was valued (0.89) **.**

statistical methods

After the data collection had been completed, the data had been verified, compiled and classified in special tables in Excel, the data had been analysed with the statistical analysis programme (Spss), so the non-parametric methods were used Like qui square, as well as some other statistical means as follows (Repeats – percentage - arithmetic mean- Centennial Weight- Alpha Cronbach Coefficient, qui square).

RESULTS AND DISCUSSION

1. **To determine the level of Knowledge for Rural Women's to Reduce Environmental Crises in Nineveh Governorate/Hamdaniya District**

The results in Table (1) show that (122) They represent 36.0% of rural women whose level of knowledge is low in reducing environmental crises, and that (126) They represent 37.3% of their level of knowledge average while (90) They represent 26.7% of their cognitive level. The average computational knowledge of rural women in reducing environmental crises is 74.26 degrees and with a standard deviation of 12.92 degrees. The table below shows that rural women's knowledge in reducing environmental crises is low and may be due to a lack of education in rural communities and that there is a significant gap to be filled to enhance their knowledge in reducing environmental crises and these results did not agree with results of (Al-Hamd and Jasim, 2024).

Table (1): Rural women's distribution according to their level of knowledge in reducing environmental crises

Categories	repetition	Percentage	arithmetic mean	standard deviation
Low (6-0)	122	%36.0	74.26	12.92
Moderate (7-13)	126	%37.3		
high(14-20)	90	%26.7		
Total	338	100%		

2. **To Arranging rural women's knowledge paragraphs for reduce environmental crises according to their relative importance**

Table (2) shows that the paragraph that ranked first in the rankings of level rural women's knowledge in reducing environmental crises is (Non-dumping of waste in agricultural land) with an average calculation of 0.97 and one percentage weight (48.5) This indicates that the vast majority of rural women follow this practice

well, which means that they are aware of the importance of conserving agricultural land and protecting it from pollution The last-ranked paragraph is "soil sterilization prior to cultivation", with an average calculation of 0.58 and a percentage weight of 29. This paragraph is considered an advanced practice that requires technical knowledge or special techniques, and its failure to follow it may be due to a lack of awareness, resources, and knowledge.

Table (2): Classification for level of knowledge paragraphs according to their relative importance to rural women

Sequence	Paragraphs	level	arithmetic mean	Centennial Weight
1	Non-dumping of waste in agricultural land	1	0.97	48.5
3	Inexcusable use of irrigation water in agriculture	2	0.90	45
2	Non-use of insecticides in large quantities	3	0.86	43
19	Do not throw empty pesticide packaging into the river	4	0.85	42.5
15	Care for each crop's tillage operations	5	0.84	42
18	Not throwing dead animals and birds into the river	6	0.83	41.5
20	Keep every drop of water and do not overuse it	7.5	0.82	41
9	Non-dumping of domestic and agricultural waste in the river	9.5	0.79	39.5
10	Use of chemical fertilizer in recommended quantities	9.5	0.79	39.5
16	No spraying of pesticides in case of rain	11.5	0.78	39
17	Do not burn farm waste	11.5	0.78	39
5	Clean up waterways and irrigation channels surrounding agricultural land	13.5	0.76	38
6	Non-use of wastewater for irrigation of agricultural land	13.5	0.76	38
4	Do not burn garbage and use firewood in heating and cooking	15	0.69	34.5
8	Keeping animals away from housing	16	0.68	34
11	Cultivation of legume crops constantly	17	0.67	33.5
14	Work on the treatment of soil salinity	18	0.65	32.5
13	Addition of organic fertilizer (compost) to soil	19	0.63	31.5
7	Soil sterilization before planting	20	0.58	29

3. To determine the correlation between rural women's knowledge to reduce environmental crises and each of the independent variables (age, level of education, marital status, size of agricultural tenure, participation in environmental activities

1. Research age

The research was distributed into three categories using the actual range of 20-61 years, with results showing that 25 of the total research fell into the age group of 20-33 years7.4%, 110%, 32.6%, aged between 34 and 47 years old, while 203% were found to be 60.0% of female researchers aged between 48 and 61 years old. It is shown that the most female researchers belong to the age group (48-61) years In this period, the researcher is supposed to be able to decide on environmental and agricultural matters

Table (3): Distribution of female researchers by age group

Categories of age	Frequencies'	percentage	Calculated qui-squire	qui-squire Value Tabular	degree of freedom
(20-33) years Small	25	%7.4	12.5	9.488	4
(34-47) years Middle	110	%32.6			
Years high -61) (48	203	%60.0			
Total	338	%100			

In order to determine the correlation relationship between the level rural women's knowledge of reducing environmental crises according to the age variable using the qui-squire, the calculated value of qui was (12.5) at a degree of freedom (4), which is greater than the tabular value (9.488) at a level of morale (0.05), i.e. there is a correlation relationship between the two variables Thus, we reject the hypothesis of null that there is no correlation between rural women's knowledge of reducing environmental crises according to the age variable, which indicates that age plays an important role in determining rural women's awareness and effective participation in environmental issues.

2. Level of education

According to the variable level of education, the discussions were classified into six categories as shown in Table (4) It turns out that 52 researched by 15.4% Mom, 136 by 40.2% read and write, 85 by 25.1% with primary education, 20 by 5.9% with numerical education, 18 by 5.3% with secondary education, 27 by 8.1% with higher qualification from postgraduate studies

Table (4): Distribution of female researchers by level of education

Categories	Repetition	percentage	Calculated qui-squire	qui-squire Value Tabular	degree of freedom
Illiteracy	52	%15.4	13.8	11.070	5
read and write	136	%40.2			
Primary	85	%25.1			
Prep	20	%5.9			
Secondary	18	%5.3			
University and more	27	%8.1			
Total	338	%100			

In order to determine the moral correlation between rural women's knowledge of reducing environmental crises according to the level of education using qui-squire, the calculated value of qui-squire was (13.8) at a degree of freedom (5), which is greater than the tabular value (11.070) at a level of morale (0.05), i.e. there is a moral correlation between variants Thus, we reject the hypothesis of nowhere that there is no moral correlation between rural women's knowledge of reducing environmental crises according to the level of education and accepting the alternative hypothesis, which indicates that the level of education and the more educated rural women are more aware of and acceptable to sustainable strategies in the face and reduction of environmental crises.

3. Matrimonial status

Female interviewees were classified into four categories as shown in Table (5). The 26 were 7.7% per cent single women, 255 per 75.5% married women, 42 per 12.4% widows and 15 per 4.4% divorced women

Table (5): Distribution of women's discussions by marital status

Categories	repetition	percentage	Calculated qui-squire	qui-squire Value Tabular	degree of freedom
Single	*26*	*%7.7*	*3.5*	*7.815*	*3*
Married	*255*	*%75.5*			
Widow	*42*	*%12.4*			
Divorced	*15*	*%4.4*			
Total	*338*	*%100*			

In order to determine the moral correlation between rural women's knowledge of reducing environmental crises according to the marital status variable using the qui-squire, the calculated value of c2 was (3.5) at a degree of freedom (3), which is less than the tabular value (7.815) at a level of morale (0.05), i.e., there is no correlation between variants Thus, we accept the hypothesis of null that there is no correlation between rural women's knowledge of reducing environmental crises according to marital status. This indicates that marital status is not a central factor in

determining their behaviour towards the environment and may result from the fact that women, regardless of their marital status, are exposed to the same environmental challenges.

4. Size of farm tenure

The discussions were divided into three categories using the actual range of (10-120) As shown in Table (6) where the majority of rural women are found to have (10 - 46) dunums of 87.6% while they are in the low farm tenure category while 31% of the total interviews were found to be held from (47 - 83) dunums while falling into the category of medium farm holdings while 11 of them were found to be 3.2% of holders of 84 - 120 dunums

Table (6): Distribution of female researchers by size of women's agricultural holdings

Categories	repetition	percentage	Calculated qui-squire value	qui-squire Value Tabular	degree of freedom
(10-46) Dunum small Possession	296	%87.6	01.961	5.991	2
(47-83) Dunum Medium Tenure	31	%9.2			
(84-120) dunum high tenure	11	%3.2			
Total	338	*%100*			

In order to determine the moral correlation between rural women's knowledge of reducing environmental crises according to the variable size of agricultural tenure using the qui-squire, the calculated value of qui-squire was (01.961) at a degree of freedom (2), which is less than the tabular value (5.99) at a moral level (0.05), i.e., there is no correlation between variants Thus, we accept the hypothesis that there is no link between rural women's behaviour in reducing environmental crises according to the size of agricultural tenure. This indicates that agricultural tenure is not a central factor and does not affect their behaviour in reducing environmental crises.

5. Participation in environmental activities

It was divided using the arithmetic average and standard deviation into three categories by combining the arithmetic average with the standard deviation first and then subtracting the standard deviation from the arithmetic average to determine the boundaries of the middle category; the upper and lower category boundaries were determined based on the lowest value (8) The highest value (24) is expressed through the results of the study, thus identifying the categories as shown in Table No. (7) 30 rural women (8.9%) were found to be in the low participation category, 286% to 84.6% to the medium participation category, while 22% to 6.5% to the high environmental participation category

Table (7): Distribution of women's discussions by participation in environmental activities

Categories	repetition	percentage	Calculated qui-squire value	qui-squire Value Tabular	degree of freedom
low(8-12)	30	%8.9	41.986	5.991	2
(13-17) Medium	286	%84.6			
(18-22 and more) High	22	%6.5			
Total	338	%100			

In order to determine the moral correlation between rural women's knowledge of reducing environmental crises according to the variable of participation in environmental activities using qui-squire, the calculated value of qui-squire was (41.986) at a degree of freedom (2), which is more than the tabular value (5.991) at a level of morale (0.05), i.e. there is a correlation between the two variables Thus, we reject the hypotheses that there is no moral correlation between rural women's behaviour in reducing environmental crises according to the variable of participation in environmental activities. This indicates that rural women who engage in environmental activities have more conscious and effective behaviors in the face of environmental crises because of the training and guidance they receive.

CONCLUSIONS

1. The results showed that rural women's knowledge of environmental crisis reduction is moderate and tends to decrease. This reflects weak environmental awareness and a lack of knowledge of the importance of private actions to reduce environmental crises.
2. Regarding ranking rural women's knowledge paragraphs according to their importance, the paragraph (non-dumping of waste in agricultural land) ranked first with an average arithmetic of 0.97. This indicates that most rural women follow this practice well, which means they know the importance of preserving agricultural land and protecting it from pollution. Paragraph ("Soil sterilization before agriculture") ranked last with an average arithmetic of 0.58. This paragraph is considered an advanced practice requiring technical knowledge or special techniques. Its lack of application may be due to a lack of awareness, resources, and understanding.
3. The results showed a correlation between each variable (age, level of education, participation in environmental activities). We conclude that these variables are critical and have a significant impact on rural women's knowledge of reducing environmental crises, preferably in other studies, while measuring rural women's level of expertise in reducing environmental crises.

Recommendations

In light of the research findings, the Researcher recommends that

1. Directing specialized indicative programmes to raise rural women's knowledge of the research area towards related environmental issues

2. To direct some television and radio programmes to raise rural women's knowledge of the research area towards environmental issues and to reduce environmental crises
3. Involvement of civil society bodies in the advancement of rural women, as they have a beneficial role to play
4. Attention to the use of modern technology and social media in extension work, which has a significant impact on increasing knowledge among members of society in general and rural areas in particular
5. The need to intensify programmes and efforts aimed at conducting pro-environmental behavioural changes, equipping them with knowledge, encouraging them to participate in the membership of rural local organizations and communicating with agricultural guides to help them develop their capacities and applying penalties to those who harm the rural environment for its rapid impact on environmental protection

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

معارف النساء الريفيات في نينوى بإدارة الأزمات البيئية وعلاقتها ببعض المتغيرات

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الخلاصة

هدف البحث إلى التعرف على مستوى معارف النساء الريفيات في الحد من الأزمات البيئية في محافظة نينوى/ قضاء الحمدانية، وتحديد العلاقة بين مستوى معرفة النساء الريفيات في الحد من الأزمات البيئية وبعض المتغيرات المستقلة التالية (العمر، مستوى التعليم. الحالة الزوجية، حجم حيازة المزرعة، المشاركة في الأنشطة البيئية) تكونت شاملة البحث من 338 امرأة ريفية. تم جمع البيانات عن طريق استمارة الاستبيان الخاصة بمنطقة الحمدانية. تم استخراج الثبات بواسطة معادلة ألفا كروخ مع عينة استطلاعية مكونة من 30 باحثاً، وكان الثبات 0.87، وبعد ذلك تم جمع البيانات وإفراغها وتحليلها من خلال برنامج SPSS. وأظهرت النتائج أن معارف النساء الريفيات للحد من الأزمات البيئية كانت متوسطة تميل إلى الانخفاض. فيما يتعلق بترتيب الفقرات حسب أهميتها فإن الفقرة (عدم إلقاء النفايات في الأراضي الزراعية) احتلت المرتبة الأولى بمتوسط حسابي 0.97 كما أظهرت النتائج وجود علاقة الارتباط بين معارف النساء الريفيات للحد

من الأزمات البيئية مع مجموعة من المتغيرات المستقلة المدروسة وهي(العمر مستوى التعليم , المشاركة في الأنشطة البيئية)، لذلك يوصي الباحث ضرورة تكثيف البرامج والجهود الرامية إلى إجراء تغييرات سلوكية مؤيدة للبيئة وتزويدها بالمعرفة وتشجيعهم على المشاركة في المنظمات المحلية الريفية والاتصال بعمال الإرشاد الزراعي لمساعدتهم على تطوير قدراتهم.

الكلمات المفتاحية: النساء الريفيات، الأزمات البيئية، مستوى المعارف.

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