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Level of Implementation by Rural Women in Bashiqa District of Extension Instructions Related to Rationalization of Water Consumption

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Abstract: This study aimed to determine the level of implementation of rural women in Bashiqa area of the extension instructions related to rationalising water consumption in Bashiqa area / Nineveh Governorate / Iraq, in addition to determining the correlation between the level of implementation of this activity with a number of independent variables. The study also aimed to determine the level of obstacles facing women's implementation of the extension instructions, the research tool consisted of three parts, where the first part included a number of personal factors, while the second part consisted of 20 paragraphs related to rationalising water use and the third part related to obstacles, which numbered 8 paragraphs, and The stability coefficient of the questionnaire extracted by the Cronbach's alpha method was 0. The research sample consisted of 140 randomly selected female respondents from 24 villages of Bashiqa district. spss and excel software were used to tabulate, classify and analyse the data, and the results showed that 77% of the respondents' application of the extension instructions is moderate and tends to decrease, and there was a significant positive correlation between the dependent factor and two variables (number of children in the family, family ownership of an alarm device It was also found that there is a significant negative correlation between the dependent factor and the two variables (age, the family owns a water well in the garden of the house), and the results indicated that there are moderate and tend to be significant obstacles that hinder the implementation of the extension instructions to reduce water consumption by the female community, and the study finally provided a number of conclusions and recommendations.

Key words: : Rural women, extension instructions, rationalising water consumption.

1. Introduction

There is a growing recognition throughout the world of the urgent need for Integrated Water Resources Management for the effective and efficient management of water resources **(Rahaman *et al*.,**

2004). Water is one of the most demanded resources in rural areas of developing countries **(Delgado *et al*., 2021).** With the passage of time and the improvement of global technological development, the prices of water extraction and delivery to local communities began to decrease, which led to an increase in consumption rates and became a warning of the increasing occurrence of water crises accompanying the phenomenon of climate change, which necessitates the search for providing techniques to rationalise water consumption **(Mogogana *et al*., 2018)**. Most Arab countries are suffering from a shortage of fresh water as a result of climate change, the effects of which are beginning to be felt in many countries and regions that used to be considered densely vegetated **(Al Obaidi, 2011)**. The availability of enough water has started to become a problem for Iraq, disruptions to human health and productivity, as well as local and national development, have resulted from water-wasting behaviors that have started to negatively impact the collective reality of certain Arab societies, making it difficult for them to meet their water quotas **(Alataaby, 2014).**

More effort has to be put into teaching people living in these areas how to utilize water efficiently. In particular, women in rural areas, who make up half of population, work effectively side by side with men, and are responsible for taking care of their parents, among her many responsibilities as a parent were instilling moral principles in her parents and being an early adopter of water conservation practices **(Kandi *et al*., 2018)**.

The majority of water consumers are women, and this is particularly true in rural regions where women already face additional challenges in obtaining clean water and proper sanitation **(Hadad, 2015)**. In most developing countries, women are the principal food producers **(Ray, 2007)**. Despite this critical and transformative role, women face persistent obstacles and promote their mobility's, including poor water-use security levels, which limit their agricultural performance **(Sharaunga and Mudhara, 2016)**, Water is critical to sustainable agriculture and attainment of food security Given women's key role in food production in most rural areas, improving their wateruse security would be expected to improve agricultural production and consequently rural livelihoods **(Wenhold *et al*., 2007)**.

In order to achieve this, it is necessary to activate environmental awareness programmes that focus their activities on teaching women how to rationalise water consumption and preserve ground and surface water levels in the study area to ensure the right of subsequent generations to have access to water.

Based on what the researchers observed from the fluctuating levels of water use by rural women in the study area, it was decided to conduct an exploratory study in order to learn about the reality of water consumption behavior by rural women for the purpose of forming a vision that contributes to directing the behavior of individuals towards water conservation and implementing correct procedures that reduce water wastage in the present and the future.

Research Objectives

1) assessment of Level of implementation by rural women in Bashiqa district of extension instructions related to rationalization of water consumption in general.
2) Finding the correlation between the independent factors and the level of implementation by rural women of the extension instructions related to rationalizing water consumption
3) Determine the level of obstacles limiting the implementation of extension instructions to rationalize water use
4) Ranking the obstacles faced by rural women in implementing the guidelines related to water consumption conservation based on the arithmetic mean.

2. Methodology

1- Research Area

The study was conducted in the Bashiqa region, which is located in the northeast of Nineveh Governorate/Iraq, and includes many villages that face fluctuations in water availability, which makes the female population facing challenges in their daily life situations.

2- Community and sample of research

The research community consisted of 48 villages, and 50% of the villages were randomly selected, as the number of villages in which the questionnaire was distributed amounted to 24 villages, and then 140 respondents were randomly selected from these villages included in the study sample.

3- Preparation research tool, Validity and Reliability

The paragraphs of the questionnaire were collected and prepared through scientific sources related to rationalizing water consumption, in addition to the researchers' knowledge of the reality of water use in the research community. Then the questionnaire was presented in its initial form to ensure the content validity to a number of specialists in agricultural extension and after taking their opinions and suggestions, the questionnaire was distributed to 30 respondents who were excluded from the final sample and then the Alpha Cronbach method was used to find the value of the reliability , which reached 0.91 and this value is acceptable according to the opinions and statistical theories stipulated by the statistical opinions and theories

The first part of research tool

This part consisted of five factors as follows:

Age

Respondents were asked about their age at the time of data collection.

Educational attainment

Respondents were asked about their educational levels, the alternatives for this question were as follows (Illiterate, reads and writes, respondent has a primary school certificate, respondent has junior study certificate, respondent has higher School certificate, respondent has a diploma study certificate, respondent has a bachelor's degree certificate, respondent has higher education certificate) and the following numerical values were set for it (1, 2, 3, 4, 5, 6, 7, 8).

Number of children of family

Respondents were asked about the number of children who need guidance while using water to close the taps tightly**.**

The family owning a water tank overflow alert system on the roof of the house

The respondents were asked whether they have a water tank full alert device on the top of the roof of the house and were assigned the following response alternatives (yes, no) and the numeric value (2) was assigned to the answer (yes) and the numeric value (1) to the answer (no).

The family owning a well in the backyard of the house

Respondents were inquired if they own a water well in their residential garden. The subsequent options were designated to respond to this inquiry (yes, no), with the numeric value (2) assigned to the response (yes) and the numeric value (1) given to the answer (no).

The Second Part

This section consisted of 23 paragraphs, to which the following alternatives were allocated as follows: which are (I always do this, I do it sometimes, I do it rarely) and put numerical values (3,2,1) respectively.

The Third Part

Eight problems were identified based on discussions with local people in the study area, and four alternatives were assigned to each problem (high impact, moderate impact, low impact, and very low impact). With numerical values (4,3,2, 1) respectively.

Data collection and analysis

Data were collected from July to September 2024, and the statistical tools that were used were frequencies, ratios, arithmetic averages, and Pearson and Spearman's correlation coefficient were used through the Excel and spss program.

3. Results and Discussions

First objective: Assessment of **Level of implementation by rural women in Bashiqa district of extension instructions related to rationalization of water consumption in general**

It was found that the highest numerical value for the level of rural women's implementation of extension instructions related to rationalizing water consumption is (54) and the lowest value is (25) with an arithmetic mean of (38.4) and a standard deviation of (7.8). The range was used to divide the categories of this purpose into three levels.

Table (1). Show the Level of implementation by rural women in Bashiqa district of extension instructions related to rationalization of water consumption in general

No	Categories	freq	%	mean
1-	Weak implementation (25-34)	45	32	29.4
2-	Moderate implementation (35-44)	63	45	39.3
3-	Serious implementation (45 and more)	32	23	49.3
Total		140	100	

It can be seen from Table 1 that the application of the extension instructions related to water consumption in the Bashiqa area is average and tends to decrease with 77 %. This may be due to the absence of a long-term view of the importance of water conservation and may result from the low educational level and lack of economic resources that cause pressure on women in the field of doing household chores related to water consumption.

Second objective: Finding the correlation between the independent factors and the level of implementation by rural women of the extension instructions related to rationalizing water consumption

Age

Through the results, it was found that the highest value for age was 54, the lowest value was 24, the arithmetic mean was 40.3 and the standard deviation was 7.9. To find a correlation between this factor and the level of implementation of rural women in the study area of the guidelines related to the rationalization of water consumption, Pearson's correlation coefficient was used and its value was -.170* at a significance level of 0.05, and it indicates a significant inverse relationship and this may be due to the fact that young women have a higher level of application of water conservation techniques than adult women because of their higher physical ability in the activities of daily life that women do while doing their household duties as the most practices of water conservation It needs physical effort that older women may not be able to implement because of their advanced age and deteriorating health.

Educational attainment

It was found that the majority of the respondents had completed primary education, and their average implementation of water conservation techniques was 38.2. To find the correlation between educational level and the dependent variable of this study, the Spearman correlation coefficient was used, which yielded a value of 0.36, indicating no significance. This may be due to the fact that the respondents could be influenced by other priorities for water use, regardless of their educational level, such as life factors and family living conditions.

Number of children of family

The highest numerical value for this variable reached 9, while the lowest value was 1, with an average of 3.5 and a standard deviation of 1.2. The majority of families with children had between 1 and 3 children, accounting for 67%. Their average application was 37.4. To find the correlation coefficient of this variable with the dependent variable, Pearson's correlation coefficient was used, which amounted to 0.285**, indicating a significant positive correlation at a significance level 0.01. This may be due to families with a larger number of children, where women tend to adopt water-saving behaviors, as children require a lot of water for washing their clothes or for their random daily water usage. Consequently, women are inclined to monitor their children's behavior and focus on preventing water wastage by ensuring that taps are not left running or closed improperly, along with other random behaviors that could lead to greater water loss.

The family owning a water tank overflow alert system on the roof of the house

With regard to this variable, it was found that the majority of respondents have a device to alert them to the fullness of the main water tank on top of the house, where the number of respondents who answered (yes) reached 80 respondents (57%) and their average application was 40.1, and the value of Spearman's correlation coefficient was 0. 281**, which shows a significant correlation at a significance level of 0.01. This may be because families who are interested in acquiring such a device will be an indication of their high awareness of the importance of rationalizing the quantities of water used, in addition to their knowledge of the damage of water leakage to the roof of the house and its negative impact on the ceilings.

The family owning a well in the backyard of the house

The results indicated that more than half of the surveyed women who own a household well in the outdoor area of their homes numbered 74, accounting for 53%. The average application of the dependent variable among them was 36.6, and the value of the Spearman correlation coefficient was -

0.231**, indicating an inverse relationship between this variable and the level of implementation of water-saving techniques by rural women. This may be attributed to the reliance of women on well water for their water needs, leading them to use large quantities of water without considering the importance of conserving water consumption, especially since the amounts extracted from wells are not metered, and thus do not incur water fees that ultimately contribute to the state treasury.

Table (2). show correlation between the independent factors and the level of implementation by rural women of the extension instructions related to rationalizing water consumption

variables	Freq.	%	Arithmetic mean	Pearson value	Spearman value
age				-.170*	
(24-36) year	49	35	40.5		
(37-49) year	72	51	37.8		
50 and more	19	14	34.8		
Educational attainment					.036
Illiterate respondent	8	6	38.7		
Respondent reads and writes	24	17	37		
Respondent has a primary school certificate	55	39	38.2		
Respondent has junior study certificate	27	19	37.1		
Respondent has higher School certificate	15	11	41.0		
Respondent has a diploma study certificate	8	6	39		
Respondent has a bachelor's degree certificate	3	2	40.6		
Respondent has higher education certificate	0	0	0		
Number of children of family				.285**	
(1-3) child	94	67	37.4		
(4-6) child	43	31	39.6		
(7-9) child	3	2	50.3		
The family owning a water tank overflow alert system on the roof of the house					0.281**
yes	80	57	40.1		
no	60	43	36.1		
The family owning a well in the backyard of the house					
yes	74	53	36.6		-.231**
no	66	47	40.3		
Total	140	100%			

Third objective: Determine the level of obstacles limiting the implementation of extension instructions to rationalize water use

The results showed that the lowest numerical value of the obstacles limiting rural women's implementation of the extension instructions related to rationalizing water consumption was 12, the highest value was 26, and the arithmetic mean was 19.4, and 90% of the respondents' answers indicated the existence of medium and tend to be large obstacles that limit the rationalization of water consumption, and this may be due to a number of factors that negatively affect the reality of water use in the study area.

Table (3). Shows the levels of obstacles limiting the implementation of extension instructions to rationalize water use

Level of obstacles	freq.	Ratio %
(12-16) Simple Obstacles	14	10
(17-21) Moderately common barriers	76	54
(22-26) Common obstacles	50	36
Total	140	100

Fourth Objective: Ranking the obstacles faced by rural women in implementing the guidelines related to water consumption conservation based on the arithmetic mean

For the purpose of accomplishing this aim, the arithmetic mean was ranked in decreasing order for each barrier that was chosen by the respondents.

Table (4). Presents the ranking of obstacles based on the arithmetic mean in decreasing order

No.	Obstacles	arithmetic mean
1	Randomness of Well Drilling	2.65
2	Weak awareness-raising efforts by the Agricultural Extension Service	2.60
3	The locals' failure to adhere to their allocated water shares.	2.52
4	The large number of children within families	2.43
5	The lack of self-awareness among families regarding the importance of rationalising their water consumption.	2.42
6	The distance of the area from the Tigris River.	2.27
7	Irregularity in the timing of water supply through the government pipeline network	2.15
8	Rising temperatures as a result of climate change	2.10

Table (4) shows that the problem of (drilling wells randomly) was solved in the first place with an arithmetic whip (2.65) and the reason for this may be that families that own wells in their homes tend to consume water at high levels without adhering to the guidelines for rationalizing use under the pretext of weak water that arrives through networks and official systems that send water from pumping stations from the city of Mosul to the study area, in addition to the fact that the wells are not subject to wage tax that makes the people abide With the techniques of rationalizing the use of water, and with regard to the problem that solved the last place is (high temperatures as a result of climate change) and was an arithmetic average of (2.10) and the reason for this may be that this problem has more effects in the phenomenon of summer than in winter and not throughout the year, as the needs of the people for water in a proportion is not large in the summer to cool homes in the process of operating traditional water coolers, as the dependence of the people in cooling is through air conditioners modern electric

Conclusions

1. The presence of wasteful use of water, which makes the region vulnerable to future water crises that affect the lives of the people.
2. Young respondents have more ability to cope with the water crisis than older women.
3. The growing random drilling of wells and the absence of government control over them threaten low groundwater levels and threaten the right of subsequent generations to access water.

Recommendations

1. The need to implement governmental monitoring mechanisms to encourage women in the study area to adopt water conservation measures.
2. The need to intensify awareness campaigns and agricultural extension programs related to rationalizing water use and include elderly women in the study area.
3. The need for local governments to impose regulations on well drilling and regulate it according to the realistic water needs of the local community in the study area.
4. The need to enact laws that require citizens to use water in accordance with the necessary needs to prevent water wastage.

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