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RESEARCH ARTICLE

Extension Tasks for Agricultural Employees in the Field of Combating Desertification in Nineveh Governorate

Abdullah Akram Abdullah[1*], Talal Saeed Hameed[2]
[1, 2] Agricultural Extension and Technology Transfer Department, Faculty of Agriculture and Forestry, Mosul University, Iraq

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***Corresponding Author:**

stalal1982@uomosul.edu.iq

ABSTRACT

This study was conducted in Nineveh Governorate and Identifying the level of extension tasks for agricultural employees in the field of combating desertification in Nineveh Governorate, Arranging the areas of extension tasks for agricultural employees in the field of combating desertification according to their relative importance, and identifying the correlation between the extension tasks of agricultural employees and the independent variables. The research community included agricultural employees working at the headquarters of the Nineveh Agriculture Directorate and its affiliated agricultural divisions (30). Thus, the total size of the population was (329) agricultural employees. The first (pre-test) consisted of (30) employees to extract stability, and a simple proportional random sample of (75%) was selected from the total population. Thus, the final research sample was (247) respondents. In order to achieve the research objectives, a questionnaire form was designed that included two parts. The first: It included the independent variables related to agricultural employees, which are (age, academic qualification, length of job service, professional ambition, and participation in extension activities). As for the second part contains a scale to measure the extension tasks of agricultural extension workers in the field of combating desertification. It included (64) items distributed over four areas of combating desertification. it was analyzed using the statistical analysis program (Version 24 SPSS). following statistical methods were used (range, percentage, frequencies, arithmetic mean, standard deviation, Pearson simple correlation coefficient, Spearman rank correlation coefficient, Guttman equation). The results of the research showed that the extension tasks carried out by the respondents in the field of combating desertification in Nineveh Governorate are moderate tend to low, and that the field (management of irrigation water and wells) came in first place, with an arithmetic average of (4.17). While the field (protecting soil from degradation) ranked fourth and last, with an arithmetic average of (3.36), The research results also showed the independent variables that had a significant impact on the extension tasks of agricultural employees in the field of combating Desertification are (duration of job service, professional ambition, participation in extension activities), while the variables that did not have any significant impact on the extension tasks of agricultural employees in the field of combating desertification are (age, academic specialization).

INTRODUCTION

The problem of desertification is one of the serious problems facing agricultural lands in the world, which constitutes a real danger and an obstacle to the development of agricultural production. Its impact has increased significantly during the twentieth century, which has led to the giving of many names to this phenomenon, including (desert advance, desert encroachment). The emergence of the desert) as all of these names mean the expansion and spread of desert and semi-desert conditions in environments with environmental and climatic conditions and conditions suitable for human, animal and plant life (Saadia and Abdel Abbas, 2004). Reclaiming decertified lands or those on the verge of desertification is considered a very difficult matter (Abusmor, 1999). Therefore, it is necessary to protect lands from desertification and work to reduce its causes, represented by soil erosion and erosion due to climatic erosion conditions due to winds and floods, and to preserve vegetation cover as much as possible (Wahib, 2003). In addition to avoiding unaccounted activities practiced by humans, such as bulldozing orchards and agricultural lands to build residential homes and plowing the soil at other times, which directly contribute to accelerating the processes of erosion and erosion (Eswaran. and Reich. 2001)(Said, 2011). There have been several definitions of the phenomenon of desertification, the most important of which is the definition of the United Nations organizations, especially UNEP, that desertification is the creation of a negative change in the characteristics of the biological environment, which leads to the creation of conditions that make it closer to desert conditions or drier. (Al-Hiti, 2011). It is time for land degradation in dry, semi-arid and semi-humid areas resulting from various factors, including climate change and human activities (Salloum and Adnan, 2007). As for Iraq, like all countries located in the region, it is exposed to desertification and its effects from encroaching sand dunes and dust storms, as a result of the unguided exploitation of natural resources, which has led to the deterioration of these resources, the acceleration of desertification processes, the deterioration of vegetation cover, and the salinization and flooding of large areas of agricultural land, which has an impact on Negative impact on the country's economy and agriculture and the health of the Iraqi citizen (National Action Program to Combat Desertification, 2020). As Iraq loses about 100 thousand dunums of its agricultural land every year as a result of the deterioration of the agricultural soil situation during the past five years, and 90% of the area of Iraq was affected by soil erosion as a result of winds and storms (Adel, 2011). This caused their movement from the countryside to the city, which directly affected not only agriculture, but even the demography of cities as well (Habib, 2001). Given the seriousness of this phenomenon, the United Nations has designated a global day to address it on June 17 of each year, calling it the World Day to Combat Desertification and Drought (Delph et al., 2013). It is noteworthy that the United Nations Convention to Combat Desertification in Paris, which was signed by the Arab countries in 1994, aims to avoid the long-term consequences of desertification, such as mass migration, a shortage of animal and plant species, and climate change (Farkash et al., 2007). This called for the need to find a way to identify and improve these increasing problems resulting from desertification (Atrushi et al., 2014). Due to the importance of the agricultural extension system as an educational and developmental institution that has the ability to confront these negative effects on rural communities, it was therefore necessary to identify the role of the extension tasks of the agricultural extension system in combating desertification, in addition to identifying the requirements of the future agricultural extension role for possible scenarios of climate change and identifying future needs. To respondents from the agricultural extension system through generating and providing scientific knowledge (Al-Zarqa et al., 2015). This is because it is one of the educational systems spread in the countryside that can play an important role in the process of preparing rural people, and which can play an important role in the process of preparing rural people (farmers, rural women, and rural youth) to deal harmlessly with the environment. The extension here plays a media role in informing the rural people of these laws and legislation and urging them to implement them without resorting to imposing sanctions against them, by setting appropriate mechanisms to achieve broad popular participation in preparing, monitoring, following up and implementing development projects aimed

at combating desertification, the spread of green belts, protecting plants and reducing From environmental pollution resulting from agricultural, industrial, and tourism activities carried out by humans (Awad and Muhammad, 2022).

Research aims

1- Identifying the level of extension tasks for agricultural employees in the field of combating desertification in Nineveh Governorate in general.
2- Arranging the areas of extension tasks for agricultural employees in the field of combating desertification according to their relative importance, which are: (First: field of irrigation water and well management, second: field of preserving and protecting vegetation, third: field of protecting soil from degradation, fourth: field of role of environmental awareness Extension).
3- Identifying the correlation between the extension tasks of agricultural employees and the following independent factors (age, academic qualification, duration of job service, professional ambition, and participation in extension activities).

MATERIALS AND METHODS

This study was conducted in Nineveh Governorate, as it occupies an area of (37,323) km2 out of the total area of Iraq, which amounts to (435,052) km2, and thus it constitutes a percentage of (8.6) of the area of Iraq (Bilal and Badr, 2012: 55). Its population is estimated at approximately 5,034,000 people, according to the Nineveh Statistics Department (Central Bureau of Statistics). In terms of geographical location, it occupies the northwestern part of Iraq. From the north, it is bordered by Dohuk Governorate, from the south by Salah al-Din Governorate, from the west by the Syrian Arab Republic, and from the east by the governorates of Erbil and Kirkuk. As for the Tigris River, it passes through the governorate in a wavy manner from north to south, dividing it into two approximately equal parts. The second largest city in Iraq in terms of population (Ibrahim, 2015: 738). Agriculture in Nineveh is characterized by permaculture. Due to the presence of large areas suitable for agriculture, the largest part of it was allocated to the cultivation of wheat and barley crops, as well as cotton, milkshakes, yellow corn, sunflowers, vegetables, legumes, oilseeds, and fodder. After the opening of irrigation projects, the cultivated areas began to expand, and Nineveh is considered one of the first governorates for grain production in Iraq (https://www.ninava.gov.iq/nineveh.php.). The research community included all agricultural employees working at the headquarters of the Nineveh Agriculture Directorate and its affiliated agricultural divisions (30) divisions. Thus, the total size of the population was (329) agricultural employees distributed among the directorate's headquarters and its agricultural divisions, numbering (28) agricultural divisions, from which the test sample was excluded. The first (pre-test) consisted of (30) employees to extract stability, and a simple proportional random sample of (75%) was selected from the total population.

Thus, the final research sample was (247) respondents. In order to achieve the research objectives, a questionnaire form was designed that included two parts. The first: It included the independent variables related to agricultural employees, which are (age, academic qualification, length of job service, professional ambition, and participation in extension activities). These variables were measured as follows:

Age: It was measured by the number of years the respondent was alive at the time of data collection.

Academic qualification: It was measured according to the following levels (agricultural preparatory school, agricultural diploma, bachelor's degree, higher certificate) and the following symbols were given to them: (4,3,2,1) respectively.

Duration of job service: This variable was measured by the number of years of service that the respondent spent in his job.

Professional ambition: This variable was measured through (12) items, half of which were positive and the other half were negative. A hierarchy was developed for it that included the following levels (agree, neutral, disagree) and the following symbols (1, 2, 3) were assigned to it, respectively, for the positive items. And (3,2,1) for negative items. The total score of these items indicates the degree of professional ambition of the respondent.

Participation in extension activities: This variable was measured through (8) items expressing extension activities, to which alternatives were allocated (I participate often, I participate sometimes, I do not participate) and the following codes were given (3-2-1) respectively.

As for the second part: This part contains a scale to measure the extension tasks of agricultural extension workers in the field of combating desertification in Nineveh Governorate. It included (64) items distributed over four areas of combating desertification in light of experts' estimates of the relative importance of each area. In order to ensure the validity of the items in terms of (wording, clarity, and comprehensiveness of the objectives of their research, and the correct distribution of the items to their specific areas), apparent honesty was measured, which is useful in gaining the trust of the subject and convincing him that the tool is real and measures what is intended to be measured. Honesty is also considered one of the most important. Conditions for a good measurement tool: A true measure is one that succeeds in measuring what it was designed for (Hassanin, 2004: 1389).

The questionnaire form was presented in its initial form to (16) arbitrators in the Agricultural Extension Department at the College of Agriculture and Forestry at the University of Mosul, Tikrit, Kirkuk, and Dhi Qar, as well as arbitrators from the Department of Psychological and Educational Sciences at the College of Education at the University of Mosul, in order to ensure the apparent validity of the questionnaire items. Some minor modifications have been made to some items. After that, the questionnaire was presented to specialized professors in the Department of Forest Sciences and the Department of Soil Sciences and Water Resources at the Agriculture and Forestry College/University of Mosul in order to achieve content validity in addition to determining the relative importance of each field of the questionnaire.

To find reliability, a random exploratory sample (pre-test) of the size of (30) agricultural employees was selected from the research community, and through the initial test, the reliability of the tool was calculated using half-splitting by finding the correlation coefficient between the odd and even items, and this indicates the stability of half of the tool, and to find the full reliability of the tool. (Guttman equation) was used instead of Spearman-Brown due to the difference in the variance of the two halves of the tool (Muhammad, 2000: 97). It reached (0.93). Most sources consider the measure stable if the value of the reliability coefficient exceeds (0.70) (Allam, 2009: 100). After collecting data for the initial test on (10/24/2023). After ensuring the clarity of the questions for the independent factors and the scale items, modifying some of them, and ensuring the stability of the scale items for the dependent factor, the form was ready to collect the final data. It was distributed to a sample of (247) respondents, and the data was collected during the period (12/5/2023 - 29/2020). 3/2024). After completing the information collection, then verifying it, transcribing the data, and categorizing it into tables organized according to the research objectives, it was analyzed using the statistical analysis program (Version 24 SPSS). Parametric statistical methods were adopted depending on the nature of the distribution of the data, which was normally distributed. Therefore, the following statistical methods were used (range, percentage, frequencies, arithmetic mean, standard deviation, Pearson simple correlation coefficient, Spearman rank correlation coefficient, Guttman equation).

RESULTS AND DISCUSSION

The first goal: to identify the general level of extension tasks for agricultural employees in the field of combating desertification in Nineveh Governorate.

The results showed that the highest numerical value obtained by the respondents in the field of combating desertification was (320), and the lowest numerical value was (64), with an arithmetic mean of (233.157) and a standard deviation of (49.785). The respondents were distributed into three categories according to the guidance tasks they carry out. in the field of combating desertification using the arithmetic mean and standard deviation method, as shown in Table (1)

Table 1: shows the distribution of respondents according to the extension tasks they carry out in the field of combating desertification in Nineveh Governorate.

Categories	Frequency	%
(64-182) low	40	16.19
(183-283) moderate	173	70.05
(284-320) high	34	13.76
Total	247	100

Table (1) also shows that the highest percentage of respondents falls within the middle category (183-283), which constituted (70.05%), and that the low category (64-182) reached (16.19%), while the percentage of the high category reached (284-320) (13.76%). It is clear to us from the above that the majority of the respondents fall into the medium and low category. This means that the extension tasks carried out by the respondents in the field of combating desertification in Nineveh Governorate are medium and tend to decline. This result is consistent with the study of (Al-Atrushi et al., 2015) and (Al-Jubouri, 2014). It does not agree with the study of (Abdel Halim et al., 2015) and (Al-Zarka, 2015).

The second goal: Arranging the areas of extension tasks for agricultural employees in the field of combating desertification according to their relative importance.

To achieve this goal, the arithmetic mean and percentage weight were used to rank the fields of combating desertification according to their relative importance. It was found that the field (irrigation water and well management) came in first place, with an arithmetic average of (4.17), as in Table (2), and this shows the superiority of this field over the rest of the fields. The reason for this may be due to the importance of managing water sources in combating the scourge of desertification. It also has major environmental repercussions and contributes greatly to improving the environment through the establishment of swamps, ponds, basins or dams to collect water in the rainy seasons and use it for irrigation and watering livestock in times of drought. This is called water harvesting or collecting. Putting water on the roofs of houses and other things (creating tanks) for consumption in scarce areas

Table 2: shows the ranking of the areas of combating desertification according to their relative importance

Ranking in the form	the Areas	arithmetic mean*	Weight percentile	rank
1	irrigation water and well management,	4.17	83.47	1
2	preserving and protecting vegetation	3.71	74.17	3
3	protecting soil from degradation	3.36	67.29	4

4	role of environmental awareness Extension	4.05	81.01	2

While the field (protecting soil from degradation) ranked fourth and last, with an arithmetic average of (3.36), this indicates the lack of importance of this field in combating desertification, and the reason for this may be due to the lack of extension activities such as training courses and workshops in this field, since the effects of Soil degradation due to desertification was not directly, but rather indirectly, as it is related to physical and chemical properties, such as the soil losing some of its properties and poor quality, so that it becomes less efficient for certain purposes, such as crop production, in addition to the lack of organic materials and nutrients, as well as soil compaction. These processes are somewhat interconnected and together cause soil and land degradation.

The third goal: determine the correlation between the extension tasks of agricultural employees and the following independent variables (age, duration of job service, academic specialization, professional ambition, participation in extension activities).

1- Age: It is clear to us from Table (3) that the minimum age of the respondents is (26) years and the oldest age is (61), where the respondents were classified into three age groups, which are the young age group (26-37) years, whose percentage reached (51.02). %), and the percentage of the middle age group (38-49) years was (38.86%), while the percentage of the older age group (50-61) years was (10.12%).

Table 3: shows the distribution of respondents according to age groups

Categories	Frequency	%	R value
Young ages (26-37) year	126	51.02	0.027 n.s
Middle ages (38-49) year	96	38.86	
Older ages (50-61) year	25	10.12	
Total	247	100	

To find the correlation between guidance tasks and age, the Pearson correlation coefficient was used, which had a value of (0.027) and indicated a non-significant relationship between the two variables according to the value (P-Value = 0.031), which is a value greater than the value of (0.05). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted, which states There is no significant correlation between the extension tasks of agricultural extension workers in the field of combating desertification and age). This means that the age of the respondents, whether young or old, has no relationship to their extension tasks, and this may be the reason for this result. This means that the age of the employee has no role in his participation in implementing extension activities, meaning that respondents of different ages perform the same roles in implementing agricultural extension activities, and these The result is consistent with the study of (Al-Jubouri, 2014) and does not agree with the study of (Al-Bitar and Ahmed, 2005).

2- Duration of job service: The results showed that the minimum period of job service for the respondents was 6 years, and the maximum service period was 29 years, with an average of 11.25 years and a standard deviation of 7.83. The respondents were divided into three categories using the range law, and the highest percentage was in the low category (6-13) years, reaching (66.80%), while The percentage of the middle group (14-21) years was (21.06%), while the percentage of the high group (22-29) years was (12.14%), as shown in Table (4)

Table 4: Distribution of respondents according to the categories of the length of job service variable.

Categories	Frequency	%	R value
low (6-13) year	165	66.80	0.380*
Medium (14-21) year	52	21.06	
High (22-29) year	30	12.14	
Total	247	100	

To find the correlation between the extension tasks of agricultural employees to combat desertification and the variable duration of job service, the Pearson correlation coefficient was used, the value of which reached (0.032) and indicates a significant relationship according to the value of (P-Value = 0.380). Therefore, the null hypothesis is rejected, which states that there is no significant correlation between Extension tasks for agricultural employees to combat desertification and the duration of job service. The alternative hypothesis is accepted, and the reason for this may be that the longer the period of job service, the greater the extension knowledge and skills of the respondents as a result of the cumulative experience and experiences they have gone through, which is reflected in the increase in their extension tasks on various agricultural topics in general and in the field of combating desertification. In particular, this result is not consistent with what he found (Al-Jubouri, 2014).

3- Academic specialization: It is clear from Table (5) that the majority of respondents are not specialists in agricultural extension, as their percentage reached (77.33%), while the percentage of respondents who specialize in agricultural extension was (22.67%), as shown in Table (5).

Table 5: Distribution of respondents according to academic specialization categories.

Categories	Frequency	%	R s value
Agricultural extension specialist	56	22.67	0.077 n.s
Not specialized in agricultural extension	191	77.33	
Total	247	100	

To find the correlation between the extension tasks of agricultural extension workers to combat desertification and academic specialization, the Spearman rank correlation coefficient was used, the value of which was (0.077) and indicates that there is no relationship between the two variables and is not significant according to the P-Value = 0. 089, so the null hypothesis is accepted, which states that there is no correlation between the extension tasks of agricultural extension workers to combat desertification and academic specialization. This indicates that more than three-quarters of the respondents have non-extension specializations, and this may lead to a reduction in their extension tasks due to the small number of extension workers compared to the specializations. other agricultural crops, and this result is consistent with the findings of (Al-Bitar and Ahmed, 2005) and (Al-Jubouri, 2014)

4- Professional ambition: The results showed that the lowest numerical value was for the respondents 6 years and the largest numerical value was 33 with an average of 10.33 years and a standard deviation of 6.76 The respondents were divided into three categories using the law of range, and the highest percentage was within the high category (6-13) as it reached (63.98%), while the percentage of the middle category (22-27) (34.41%), while the percentage of the low category (16-21) (1.61%) as shown in Table (6)

Table 6: Distribution of respondents according to the categories of career ambition variable.

Categories	Frequency	%	R value
low (16-21) year	4	1.61	0.280*
Medium (22-27) year	85	34.41	
High (28-33) year	158	63.98	
Total	247	100	

To find a correlation between the guiding tasks of agricultural employees to combat desertification and the variable of professional ambition, Pearson's correlation coefficient was used, which amounted to (0.280) and indicates a significant relationship according to the value of (P-Value = 0.032), so it rejects the imposition of nothingness, which stipulates that there is no significant correlation between the guiding tasks of agricultural employees to combat desertification and professional ambition, and accepts the alternative hypothesis, and the reason for this may be that the greater the ambition of individuals, the greater the motivation that sharpens the motivation and the arrangement of ideas, which increases the confidence of the respondents. by themselves which reflects positively

5- **Participation in extension activities:** The results showed that the lowest numerical value was for the respondents 8 years and the largest numerical value was 22 with an average of 8.33 years and a standard deviation of 6.46 The respondents were divided into three categories using the law of range, and the highest percentage was within the high category (18-22) as it reached (42.12%), while the percentage of the low category (8-12) (28.74%), while the percentage of the middle category (13-17) (29.14%) as shown in Table (7).

Table 7: Distribution of Respondents According to Categories of Participation in Extension Activities

Categories	Frequency	%	R value
low (8-12) year	71	28.74	0.156*
Medium (13-17) year	72	29.14	
High (18-22) year	104	42.12	
Total	247	100	

In order to find a correlation between the extension tasks of agricultural employees to combat desertification and the variable of participation in extension activities, Pearson's correlation coefficient was used, which amounted to (0.156) and indicates the existence of a significant relationship according to the value of (P-Value = 0.014), so it rejects the imposition of nothingness, which stipulates that there is no significant correlation between the extension tasks of agricultural employees to combat desertification participating in extension activities, and rejects the alternative hypothesis. This may be due to the fact that the increased participation of respondents in extension activities led to the expansion of their perceptions and horizons of thinking, which led to an increase in their performance of the guiding tasks entrusted to them in the field of combating desertification in the research area. This result is consistent with what he found (Abdel Halim et al., 2015) and (Bitar and Ahmed, 2005).

CONCLUSIONS

1- We conclude that the average level, which tends to decrease, for the guiding tasks of agricultural employees in the field of combating desertification in Nineveh Governorate is due to the lack or weakness of the guiding role in the research area, represented by training courses, guidance posters, awareness campaigns and workshops that urge respondents to preserve the environmental aspects of water resources, soil and vegetation cover.
2- We conclude that the management of water resources resources is the largest and most important part of the areas of study that must be paid attention to and preserved because of its great impact.
3- We conclude that the most important ways to preserve and exploit water resources as best as possible are through the application of water harvesting techniques.
4- We conclude that agricultural extension through its various activities contributes significantly to the eradication of desertification.

RECOMMENDATIONS

1- The Directorate of Agriculture of Nineveh and the Extension Center should work to increase extension activities in the research area by intensifying training courses, workshops, guidance posters and posters that urge and educate individuals to combat or reduce desertification.
2- The Directorate of Agriculture of Nineveh and the agricultural divisions should educate farmers about the negative environmental, economic and social effects of desertification on the individual through seminars, television and radio programs, in addition to the exploitation of the Internet and social networking sites.
3- The departments concerned with water resources affairs in the governorate should clarify the methods of preserving water resources and their good management by clarifying the importance of modern irrigation techniques, such as the application of water harvesting techniques by holding seminars or by announcing them in various media.
4- The Directorate of Mosul Municipality and the Directorate of Agriculture of Nineveh should urge citizens to plant some special varieties of trees that are suitable for harsh environmental conditions through afforestation campaigns in the province.

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