

## Original Research Article

# The Role of Workers in the Agricultural Sector in Protecting Natural Resources towards Sustainable Development

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**Abstract:** The natural resources are the elements created by God Almighty, on this planet to facilitate human life, such as vegetation, water, oil, and its derivatives. This study aims to achieve the obstacles to the extension work and maintain the conservation of natural resources also to know the impact of personal characteristics on the conservation of natural resources. The study includes the collection of data using a questionnaire form that will be distributed to agricultural extension workers in the Anbar and Baghdad provinces, both from the agricultural departments and the agricultural division. Data were obtained from 130 extension personnel. It was analyzed using descriptive and inferential techniques and used program SPSS to identify the correlation between the independent variables and the dependent variable in the study. The results of the study indicate that the age, gender, experience, education level, specialization, work location, training, sources of agricultural information, knowledge, and skill in animal husbandry of the respondents its effects on the management of the natural sources. In addition, a significant relationship between the conservation of natural resources and knowledge and skills in animal husbandry, soil, plant technical, and personal characteristics at level 0.05 and sources of agricultural information at level 0.01.

**Keywords:** Agricultural Sector, Climate change, Water, Sustainable Development, Conservation, Natural Resources.

## INTRODUCTION

The preservation of natural sources means preserving future generations from poverty, hunger and providing better opportunities for human life in general. All materials, which man obtains from the environment to satisfy his needs are known as resources. People may obtain satisfaction for their needs from the local environment in which they live or obtain it from other parts of the country or other countries of the world (William *et al.*, 2011). Demand for natural resources has increased as a result of the increasing growth of the world's population and the high standard of living in many countries. While demand for resources has increased, the supply has not been met. The result was that some resources ran out quickly. Between 1650 and 1850, the world population doubled. Since 1850 it has quadrupled (Khan *et al.*, 2011). Climate change refers to a change in the state of the climate that can be identified (e.g. Using statistical tests) changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. It refers to any change in climate over time, whether due to natural variability or as a result of human activity (Panjshiri, *et al.*, 2018). This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and that is in addition to natural climate variability observed over comparable periods (Anonymous. 2007).

However, the continued need to provide a resource causes the difficulty of maintaining another resource. The land needed for food, wood, or fuel production is often valuable for wildlife, leisure opportunities or natural beauty. For example, dam construction may provide water to irrigate farmland, or to generate electricity, but it may damage scenic lands and wildlife habitats, which means changing nature (Umar *et al.*, 2018). To date, water managers have typically

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assumed that the natural resource base is reasonably constant over the medium term and, therefore, that past hydrological experience provides an excellent guide to future conditions. The climate change challenges these conventional assumptions and may alter the reliability of water management systems. Thus, a planned adaptation to water management systems is required (Sharma *et al.*, 2018).

The population of Iraq classified under the poverty line in 2003 exceeded 12 million, out of the 26 million population (Ministry of Planning Statistics 2009), of whom at least 1 million are in the most severe poverty cases, and receive only one meal a day. The remaining ration card is their only source of food. Although government statements and reports indicate that this number has fallen in 2007 to 7 million. That the proportion of food security for citizens in the country has increased by 75 percent than in 2005, but that remains illogical and doubtful and is not identical to the reality of the Iraqi people (Al-Alak *et al.*, 2013). The high standard of living in many countries strongly supports the growth of the industry. The industry uses huge amounts of fuel and other sources. It depends on the continuous supply of these resources. In any event, unless we practice maintenance, the shortage of some resources will appear over the next 100 years.

Agriculture has become known as a knowledge-intensive industry if the tremendous scientific and technological progress of recent decades has led to the creation of many agricultural innovations in the form of better methods, practices, methods, and tools for managing the production and marketing of crops and different agricultural commodities or better means of managing agricultural resources. These methods have many comparative advantages and lead to their application in the technical, economic and social aspects (Saleh, 2017). Panjshiri, and other (2018) states that the concept of rational agricultural lies in the organized and continuous activity, the technicians with specific terms of reference, the participation of farmers, and the understanding and correct application of agricultural techniques. The activity in the countryside, linkage with scientific research, would provide some benefits such as increasing agricultural production and improving the standard of living of rural people. In addition, choosing the appropriate tools and, methods for an extension in every farm and rural areas by helping appropriate education the farmer to understand and apply agricultural technologies and innovations. The commonly used term “guidance” during the second half of the nineteenth century is used to describe the adult education program in England, where they have helped to expand the business, and provide educational advantages of universities by extending outside the campus to reach the nearby communities and those surrounding the University (Khin, and Hermann, 2003). Robert (2013) mentioned that developing and evolving agricultural extension organizations have no efficiency to identify with precision the degree of effectiveness, and their ability to achieve the objectives.

The initiative of the owners and workers is governed by their professional ethics and behaviors as determined by the success of entrepreneurs based on their competitiveness. The improvement of training programs can only be achieved through the possession of efficiency and effectiveness (Saleh and Man, 2017). The basic competencies such as skills, attitudes, knowledge and observable behaviors can lead to excellence in the workplace. Competency-based models can be used to create an infrastructure that promotes innovation and continuous learning in every dimension of an extension organization. Besides, competency helps in the completion of a task with good performance. Competency models are designed around the skills of the individuals and groups for them to be effective now and in the future (Panjshiri *et al.*, 2018).

Sustainable development is a call to all countries, rich and poor and middle-income countries to work to promote prosperity, taking into consideration the protection of planet Earth. These objectives are aware that the eradication of poverty must go hand in hand with strategies that build economic growth and address a range of social needs, including education, health, social protection, and employment opportunities with addressing climate change, protection of the environment. In 2015, countries have adopted a sustainable development plan for 2030 and the objectives of sustainable development 17. In 2016, the income of the Paris Agreement on Climate Change entered into force to meet the need to reduce the high temperature in the world. Read more about what the companies, governments, and individuals achieve these goals. On 1 January 2016, work began on the implementation of the sustainable development objectives of the 17 Sustainable Development Plan 2030 adopted by world leaders in September 2015 in the historic summit of the United Nations. Countries will work together during the next 15 years, bearing in mind these new goals, which are universally applicable to everyone, the mobilization of efforts to eliminate all forms of poverty and the fight against inequality and addressing climate change, with ensuring not to abandon one (Bashir *et al.*, 2018). The goals of sustainable development are based on the success of the millennium development goals and aim to move forward the eradication of poverty in all its forms. The new objectives are unique in that it invites all countries, rich and poor and middle-income countries to take the necessary measures to promote prosperity, and at the same time to protect the earth. These objectives are aware that the eradication of poverty must go hand in hand with (William *et al.*, 2011).

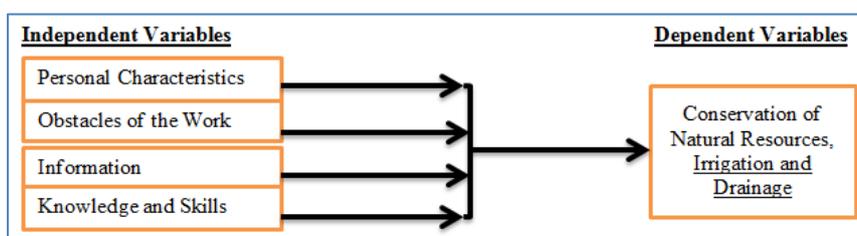
## OBJECTIVES OF THE STUDY

Many people care about the conservation of natural resources and the need for proper management for many different reasons. Farmers may maintain maintenance to prevent erosion and to maintain soil quality. But maintenance is generally important for two main reasons: to meet demands on natural resources and to maintain the quality of life. This study aims to achieve the following objectives:

1. To Know the personal characteristics of agricultural workers.
2. To know the impact of personal characteristics on the conservation of natural resources.
3. To Know the knowledge and information of respondents toward preserving the natural sources.
4. Identify the knowledge and skills for the management of the natural sources of the respondents.
5. To Know the obstacles to the agricultural work and maintain the conservation of natural resources.

## MATERIALS AND METHODS

Anbar Province is an Iraqi province located in the west of Iraq. One of the largest provinces of Iraq, an area where are the equivalent of one-third (1/3) of the area of Iraq. With an area of 138,500 square kilometers, with a total population of 1 million and 600 thousand inhabitants (12 January 2014). Historically known as the preservation of the Al-Dalim brigade before 1961. From the north, Salahuddin and Nineveh, the Syrian Arab Republic to the north-west. Jordan from the West. The governorate of Baghdad from the east. From the south of the Kingdom of Saudi Arabia and the Southeastern provinces of Karbala and Najaf. Baghdad Province is the capital governorate of Iraq. It includes the capital Baghdad as well as the surrounding metropolitan area. The governorate is the smallest of the 18 provinces of Iraq, but the most populous. Baghdad has at least 12 bridges spanning the Tigris river-joining the east and west of the city. The governors northeast includes multiple Mesopotamian Marshes (Saleh, 2017).



**Fig-1: Relationship between Dependent and Independent Variables**

The study includes the collection of data using a questionnaire form that will be distributed to agricultural extension workers in Anbar and Baghdad provinces, from the agricultural departments and the agricultural divisions affiliated with them or working in the extension centers of the extension and agricultural training department as well as the veterinary department of livestock. The questionnaire was presented to specialists in psychology and sociology as well as specialists in the field of agriculture to know the veracity of the questionnaire in terms of achieving the research objectives, as well as the validity of this form in terms of their scientific content. Thereafter, a pilot study was conducted on 20 non-finalists. The questionnaire consists of four parts for all workers in agricultural extension as well as the departments of agriculture and departments of the Veterinary Department, in the provinces of Baghdad and Anbar regardless of their administrative or functional positions. That the data to be received in 2018 exclusively. The resolution included five parts, where the first part represents the personal characteristics of the total sample, the second part was about to participate in training courses. The third part was about the skills, knowledge, and experience in the plant, technical, irrigation and drainage, soil conservation, and take care of animal husbandry, part four was about the sources of agricultural information, and the last part five-section on the problem and constraints.

The data will be analyzed using frequency, percentages, and arithmetic averages and used program SPSS to identify the correlation between the independent variables in the study and the dependent variable (conservation of natural resources) (Mohammad, 1989). A random sampling technique was used to select working with the ministry of agriculture for data collected in each of the areas. A Likert scale was used to measure the level of knowledge and skills that respondents perceived to possess about the topics in the questionnaire. A five-point Likert scale was used. A scale of 1 represented I have no skill at all, and the extreme scale of 5 represented I have a very high skill. The same Likert scale measure was used to represent the perceived level of skill and knowledge. The perceived knowledge and skills are competencies that are inculcated through the teaching and learning process. Training is a product of teaching and learning and follows the three domains of learning which are cognitive, psychomotor, and attitude. Figure 1 shows the relationships between the dependent and independent variables in this study.

### Hypotheses of the study

First: There is no correlation between the sources of agricultural information and the conservation of natural resources.

Second: There are no significant differences for the respondents according to the variables of the governorate, location of work, gender, education level, scientific specialization, and experience in agricultural extension.

Third; there is no significant effect between the following independent variables, knowledge, skills in animal husbandry, plant, technical and soil conservation, and information for the respondents and the dependent variable in this study natural.

## RESULTS OF THE STUDY

### 1- Demographic Characteristics

Table 1 discusses the demographic characteristics of respondents. The majority of respondents were male (65.6%) compared to females who were at 33.4%. Regarding their educational level; 5.1% had attained secondary school level education; 5.1% had gone through secondary school and 22.9% had gone as far as for institute level, and the majority of the employees had bachelor degrees with 65.4%, and Master degree with 1.5% also diploma degree with 9.2%. In addition, the majority of the employees from the department of agriculture with 67.2 %, specific in agricultural extension just 13.7% and from non-agriculture had 18.3% this will give less competency at the work in agricultural extension> therefore, should be a focus when employment a new employee at this department (Saleh et al, 2016). The majority of the employees attend training with 86.3% and other employees do not attend training with 13.4% therefore, need more training on the conservation of natural resources to give employees more information on sustainable development (Saleh and Man, 2017). The results of the study show that the high percentage of the respondents in marital status with married, 70.2 %, and employees were single 26.7% and divorce with 2.3%. For the experiences the high percentage in this area at category from 6 to 10 years with 35.9%, the second category from 11 to 15 years with 20.6% the third categories at 1 year to 5 years with 19.8%, and the fourth categories at the last categories 16 to 20 years and more than 21 years with 11.5%.

**Table-1: Demographic Characteristics of Respondents**

Variables		Frequency (N)	Percentage %
<b>Provinces</b>	Anbar	51	38.9
	Baghdad	79	60.3
<b>Age</b>	Less than 30 years	24	18.3
	From 31 to 40 years	46	35.1
	From 41 to 50 years	26	19.8
	From 51 to 60 years	21	16.0
	More than 61 years	13	9.9
<b>Gander</b>	Male	86	65.6
	Female	44	33.6
<b>Experiences</b>	From 1 to 5 years	26	19.8
	From 6 to 10 years	47	35.9
	From 11 to 15 years	27	20.6
	From 16 to 20 years	15	11.5
	More than 21 years	15	11.5
<b>Marital status</b>	Married	92	70.2
	Single	35	26.7
	Divorcé	3	2.3
<b>Education level</b>	Secondary school	4	5.1
	Institute	30	22.9
	College	86	65.6
	Diploma	12	9.2
	Master	2	1.5
	Ph.D	0	0
<b>Scientific background</b>	Agricultural Extension	18	13.7
	Agriculture	88	67.2
	Non-agriculture	24	18.3
<b>Location of work</b>	Agricultural directorate	17	13.0
	Agricultural training and extension office	56	42.7
	Agricultural extension center	25	19.1
	The veterinary department in the province	13	9.9
	Extension Farms	6	4.6
	Agricultural division	13	9.9
<b>Training</b>	Attend training	113	86.3
	Not attend training	17	13.4

The results at the location of work the high percentage in the department of agricultural training extension office with 24.7%, the second percentage in the department of extension farms with 19.1%, the third percentage in the department of agricultural directorate with 13.0%, for the department, agricultural extension center and the veterinary department in the province it came in the fourth position with frequency 13 and 9.9%, the last categories in the department s extension farm with 4.6%. The results of the study indicate that the social demographics of the respondents its effects on the management of the natural sources. The findings were an indication that the respondents had the technical expertise required to handle the tasks and responsibilities assigned to them, also gender, education level, these variables were not significant. Findings from the study would be beneficial to academia as students and scholars in similar and related research fields could find the study as part of relevant literature.. This is in line with Tavakoli and Lawton, (2005), findings that attributed the highest staff retention rate to job security guaranteed in the public sector. However, one study indicated a significant relationship of social demography with training (Bashir *et al.*, 2018). Another study shows that there is no significant relationship with training needs, when looking the significant variables in this study, it was found that (attended training, and the number of training courses) are significant, that means that these variables affect training needs because if employees attended training, they will get experience, skills, and knowledge (Panjshiri *et al.*, 2018). Furthermore, policymakers would find the study relevant as it points out the shortfalls and pressing needs in extension capacity as well as suggests possible remedies. Ways of improving effective advisory services via enhanced job performance were highlighted (Umar *et al.*, 2018).

**Table 2: Relationship Between Conservation of Natural Resources, with Socio Demographic and Variables using Chi-Square**

No.	Personal Characteristics	$\chi^2$ value	P-value
1.	Province	6.863	0.143
2.	Age	3.190	0.037*
3.	Gender	1.163	0.059*
4.	Experience	2.357	0.024*
5.	Marital Status	8.190	0.085
6.	Education Level	2.109	0.006*
7.	Specialization	3.310	0.007*
8.	Work Location	12.281	0.099*
9.	Training	12.010	0.043*

Note: \*. The Relation is significant at the 0.05 level (2-tailed). \* = significance

Table 2 shows that the factors of training significantly influenced the current level of existence skills among the staff. These factors of the training include whether they attended the training and the number of training courses that they attended. In both cases, the p-value is smaller than 0.05. It was found that by attending more training, it helps in enhancing the level of existence skills among the staff. Based on statistical analysis on these variables, the following null hypothesis can be rejected: There is a relationship between respondents on the conservation of natural resources and attended training, age, gender, experience, education level, specialization, and work location in this study. That's means also these variables were important to affect the conservation of natural resources. The table shows that the conservation of natural resources does not depend on the Province; in other words, the province is not a factor that influences the skills p-value > 0.05. It was found that the majority of staff in all provinces have a moderate level of skills. Therefore, when Chi-Square analysis is used, it is found a significant relationship between age, gender, experience, education level, specialization, experience, and work location, with conservation of natural resources Alnidawy (2015). From this study, extension workers with higher core and adaptation-specific competencies; more work experience, and younger are predicted to be more effective in facilitating climate change adaptation among clients.

Whatever, the socio-demographic variables to be of interest in the conservation of natural resources to perform better away from all demographic variables. In a study by Panjshiri *et al.*, (2018) the findings of years worked in the organization suggested that there was a high level of staff retention.

## 2- Knowledge and Skills in Animal Husbandry

Table 3 presents results regarding the perceived level of knowledge and skill related to animal breeding. Results show that respondents are knowledgeable in three areas. From the results shown in Table 3, it was found that the highest needed skills were in the type of fodder during growth stages and pregnancy stages of big animals with an average mean score of 3.46. This training is needed because knowledge of fodder during growth stages provides employees with information and skills to properly treat animals. The moderately needed skills and Knowledge were in the knowledge of proteins, energy, and carbohydrates in animal food with an average mean score of 3.33. While the least needed skills and Knowledge were in the skill in preparing a suitable environment for animal growth, as well as considering the relation to animal feed with an average mean score of 3.24. The results showed a higher need for skills and Knowledge with an average mean of 3.35, while skill at an average of 3.27.

The results of the study showed that the highest information needs in the field of animal production, paragraph (I have knowledge of environmental conditions and impact and relationship to animal feed), with an average mean score of 3.26 came in the second paragraph (I have knowledge of animal health status and mating and production growth) with an average of 3.25. While the third came in paragraph (I know the type of nutrition for animals before and after pollination) with an average mean score of 3.24. In addition, an indication of the results of the study that The following paragraphs in order consecutively (11, 13, 12, 6, 4, 9, 5, 1), and came the last rank in need of paragraph (I have knowledge of animal health status and mating and production growth), with an average mean score 2.82.. Based on statistical analysis of these variables, the following null hypothesis can be rejected: There is a relationship between respondents on the conservation of natural resources and knowledge and skill in animal husbandry.

**Table 3: Distribution of Respondents According to Knowledge and Skills in Animal Husbandry**

No	Knowledge and Skill in Animal Husbandry	Mean	S.D.
1	I know that there is a correlation between feeding animals and type, sex and age	2.89	1.08
2	I have knowledge of animal health status and mating and production growth	2.82	1.05
3	I have knowledge of environmental conditions and impact and relationship to animal feed	3.26	1.03
4	I have knowledge of carbohydrates, protein and energy in animal food	3.13	1.04
5	I know by coarse fodder nutrition and forage feed pellets concentration	3.02	1.03
6	I have knowledge of the wall feed types used in feeding animals/dry Green	3.15	1.01
7	I know the types of fodder during the growth stages and the stages of pregnancy for large animals	3.03	1.06
8	I know the type of nutrition for animals before and after pollination	3.24	1.03
9	I know the layout for the benefits of milk production and its relationship to feed for animals.	3.07	1.04
10	I have knowledge of diseases and parasites that infect animals.	3.25	1.10
11	I know the ways of prevention and treatment of diseases and epidemics affecting animals	3.20	1.00
12	I have experience with wild animals and how to maintain them.	3.16	1.01
13	I have knowledge of appropriate grazing and how maintaining vegetation.	3.20	1.02
	<b>Correlation-r 0.516**</b>	<b>3.10</b>	<b>1.03</b>

Correlation is significant at the 0.01 level (2-tailed).\*\* (P<0.01)

### 3- Correlation Between Conservation of Natural Resources, and Sources of Agricultural Information

The results outlined in Table 4 shows that the degree of conservation of natural resource requirement and its relationship with training courses is above average with a correlation –r-value of 0.437. The relationship is significant with the conservation of natural resources at the level of 0.01. The results of the study showed that the staff of the agriculture in the area of agricultural information, that the highest percentage of the need for agricultural information came first is (Watching TV, CD and radio programs), with an average mean score of 3.90. Thus, there is the need to provide free internet access in all departments; as well as websites with in-depth knowledge, information, and accurate scientific data to help the staff develop their scientific skills. In addition, a positive comparison was found between the training needs of employees in agricultural extension and the independent variables that include experiences and information, capabilities, and tasks required.

This suggests that the use of the internet is very important and affects their job performance, to get new information, is the last paragraph (Using the internet at work to get new information) with an average mean score of 3.83. In addition, the results of the study to shows following paragraphs replaced alternately (5, 7, 6, 8, 10, 8), but the following two paragraphs that the last rank two (Through using a computer at the works, and attend the special training courses) with an average mean score of 3.53. The respondents agreed that extension agents need training in all aspects of their job in all possible forms. Hence, there is a need to boost the use of these valuable sources of agricultural information by developing a favorable attitude through educational effort (Panjshiri *et al.*, 2018).

**Table-4: Correlation between Information and Conservation of Natural Resources**

No.	Sources of Agricultural Information	Mean	S.D.
1.	Through using the computer at the works	3.53	.97
2.	Attend the special training courses	3.53	.91
3.	Through reading agricultural books and bulletin	3.56	.93
4.	Watching TV, CD and radio programs	3.90	.95
5.	Discussing with colleagues of experienced agricultural workers	3.81	.913
6.	Information from agricultural colleges	3.67	.89
7.	Through agricultural research centers and investigation results and journal	3.78	.89
8.	I have the ability to apply scientific recommendations for agricultural crops and the possibility of delivering instructions to these crops to farmers	3.66	.89
9.	I have information to evaluate and analyze the programmes and the data	3.86	.929
10.	Information from Department of agricultural extension and training	3.59	.970
11.	Using the internet at work to get new information	3.83	.85
	<b>Correlation-r</b>	<b>0.437 **</b>	

Note: Correlation is significant at the 0.01 level (2-tailed).\*\* (P<0.01)

A study by Davis and Yi (2004) and Alnidawy (2015) established a significant relationship between agricultural information resources and conservation of natural resources, which was attributed to the available sources of agricultural information, and diverse exposures that provide the opportunity to learn novel ideas and garner modern experience and skills. Therefore, need to add teaching materials in agricultural colleges about the management of sustainable development and conservation of natural resources, and sustainability for safekeeping for generations following him with a parallel line with sustainable development, there must be increased in educating farmers to use modern technologies in irrigation to reduce the demand for water. To increase the knowledge base and expertise of extension officers, thereby decreasing the degree of training needs. Thus, these results went contrary to the earlier hypothesis that there is a significant correlation between respondents' need for training and sources of agricultural information and knowledge. The earlier hypothesis is rejected and the alternative hypothesis is accepted.

#### 4- Knowledge and Skills in Plant Technical

The determination of the degree of training needs is based on the Likert scale format, which originally consists of 5 rating positions Khan and Hermann (2003). The categories outlined in Table 4 are used to interpret the degree of training needed for each skill based on the main differences. Training needs with mean scores above 3 indicate they are strongly needed. The high degree of training need also signifies that there is an apparent inconsistency in performance. This implies the agricultural extension officers should be provided more training. Also, critical need suggests that the agricultural extension officers have low or no training in the specified skill. Plants recognized as a vital element of biodiversity workers the world and supplier are essential to our planet. Many are one thousand wild plants of economic and cultural significance.

The results of agenda No. 4 in the area of vegetation that skills and knowledge plant technical) I have skill in how to use pesticides, diseases and thickets of crops), with an average mean score of 3.40, came first in need of conservation and development of natural sources for workers in the ministry of agriculture. Methods are important to obtain a maximum crop yield, while a better schedule would help. Establishing the precise time of fertilization since each fertilizer and its method has its life cycle with a mean score of 3.44. Further skills and knowledge plant technical were calculated on a Likert scale from never needed to very strongly needed as can be seen in Table 5 with details. While came the second paragraph (Advertises the blooming season and stages of maturity of crops) with an average mean score of 3.34, and paragraph (Post-Harvest Losses and Maturity) came third with an average of (3.30) was replaced by the following paragraphs in order (6, 12, 1, 4, 2, 3, 9, 13). In addition, the study showed that paragraph (I determine the herbs and how to remove the harmful herbs) with an average mean score of 3.07 Recent came in need of information in this area. which knowledge will lead to obtaining the skill, skill getting the invader without knowledge; knowledge is an important step toward skills..

**Table -5: Distribution of Respondents According to Knowledge and Skills in Plant Technical**

No.	Skills and Knowledge in Plant Technical	Mean	S.D.
1.	I have skill in the timetable of crops and agricultural activities	3.22	.94
2.	I have skill in crop management	3.17	.92
3.	Advertises the skill in crop resistance to insect	3.15	.95
4.	I know the diseases and pests affecting crops.	3.20	1.00
5.	I have skill in how to use pesticides, diseases and thickets of crops	3.40	1.00
6.	Knowledge in crop rotation	3.26	.970
7.	Advertises the blooming season and stages of maturity of crops	3.34	1.02
8.	I determine the herbs and how to remove the harmful herbs	3.07	1.05
9.	Integrated Crop management	3.15	1.10
10.	Post-Harvest Losses and Maturity	3.30	.95
11.	The identification of the arable land appropriate soils for each crop.	3.13	1.11
12.	To the knowledge of the storage of seeds. Moisture content requirements and the requirement of storing	3.23	.90
13.	I can tables, advanced agricultural methods and crop Fertilization	3.09	1.05
<b>Correlation-r 0.462**</b>		<b>3.20</b>	<b>0.99</b>

Correlation is significant at the 0.01 level (2-tailed).\*\* (P<0.01)

Moreover, it must be reminded that the explanations of the degree of training needs are explained in terms of the importance and the attainment quadrant as mentioned below. The relevant degree of training needs implies that there is a fair need for training. The relevant degree of skills and Knowledge indicates a more weight stage compared to the medium need for training. In this case, there is a need for training, although the need might not be urgent. Based on

statistical analysis on these variables, the following null hypothesis can be rejected: There is a relationship between respondents on the conservation of natural resources and plant technical skills.

### 5- Knowledge and Skills in Irrigation and Drainage

Table 6 shows that the highest training need is in irrigation and drainage skills with an average mean score of 3.30 were 10.84. That indicating when employees know how to design, irrigation systems, they become better informed and knowledgeable in agricultural data dissemination. The moderately needed training was in “I am skilled at maintaining irrigation system” and “I have knowledge on the amount of water consumption by plant and soil” with an average mean of 3.22 was 10.62. While the lowest needed training was in water conservation with an average mean score of 3.07 is 9.43. Training in water conservation is the least needed because it is not important as the other skills, very easy to learn and all employees are well informed in the field.

**Table-6: Distribution of Respondents According to Knowledge and Skills in Irrigation and Drainage**

No.	Skills and Knowledge in Irrigation and Drainage	Mean	S.D.
1.	I can identify sources of irrigation and drainage,	3.10	1.02
2.	I can choose the appropriate water for irrigation and the selection of appropriate irrigation systems	3.26	1.00
3.	To the knowledge of the design and maintenance of modern irrigation systems.	3.26	.992
4.	I can to schedule irrigation knowledge/ skill to choose the appropriate time for irrigation	3.10	1.00
5.	To the knowledge of the maintenance of the irrigation systems	2.93	1.02
6.	To the knowledge of the appropriate assessment of irrigation and drainage system	3.09	1.06
7.	I have the knowledge of the selection and measurement of soil and plant water consumption	3.16	1.10
8.	The knowledge in water conservation	3.30	.95
9.	I can selecting plants according to their need for water availability in the region	3.12	1.11
10.	I know how to choose appropriate water for irrigation from wells or drainage when not abundance of potable water.	3.20	.92
11.	I can describe the recommendations with regard to the proper use of agricultural water	3.08	1.06
12.	I can describe the agricultural recommendations with regard to fruit crops and Aquarium	3.09	1.01
13.	I can describe the agricultural recommendations with respect to the cultivation of ornamental plants and Aquarium	3.26	1.00
14.	To the knowledge of codifying the use of water according to the need of the plant	3.27	1.00
<b>Total average</b>		<b>3.15</b>	<b>1.01</b>

The results of the study showed in Table 6 in the field of maintaining the irrigation and drainage, natural sources that (The knowledge in water conservation) with an average mean score of 3.30 came first in need of information in this area, this indicates the skill needs are high, due to the large water shortage in Iraq. While the replaced paragraph (I can choose the appropriate water for irrigation and the selection of appropriate irrigation systems I know the design and maintenance of modern irrigation systems.) with an average mean score of 3.26 came in the second, paragraph (I know how to choose appropriate water for irrigation from wells or drainage when not an abundance of potable water.) thirdly with an average mean score of (3.20). In addition, the following paragraphs in order (10, 7, 9, 4, 1, 12, 6, 11) while paragraph (To the knowledge of the maintenance of the irrigation systems) with an average mean score of 2.93. Recent rank the needs of information in this area are important in agriculture. The results of the study indicate that there is a greater need for skill and knowledge in this area. Further skills and knowledge irrigation and drainage were calculated on a Likert scale from never needed to very strongly needed as can be seen in Table 6. In addition, the high proportion of desertification, due to lack of rainwaters during the last years (Panjshiri, *et al*, 2018). The great water shortage in Iraq during recent years due to the legalization of the use of water added to the limited water quotas because of the drought. Also, all kinds of training needs were above the value of 3, meaning that all of them were strongly needed. According to Aschalew and Wubishet, (2016) agricultural extension officer (AEAs) in-service programs should focus on agricultural waste management extension, participatory technology development, and water conservation methods.

### 6- Knowledge and Skill in Maintaining Soil

The soil is fundamental to crop production. Without soil, no food could be produced on a large scale, nor would livestock be fed. Because it is finite and fragile, the soil is a precious resource that requires special care from its users. Many of today's soil and crop management systems are unsustainable; overuse of fertilizer has led, in the European Union, to nitrogen deposition that threatens the sustainability of an estimated 70 percent of nature<sup>1</sup>. On the other side, in most parts of sub-Saharan Africa, the under-use of fertilizer means that soil nutrients are exported with crops, leading to soil degradation and declining yields (Chaudhry *et al.*, 2016). Results showed in table 7 the agenda (I have knowledge and skill in the soil, water needs according to its kind) with an average mean score of 3.15, in the area of soil conservation came first in need of agricultural information in this area is important. While the (I can the estimated on the appropriate use of fertilizers and reduce the use) with an average mean score of 3.11, while came in the third categories (I

have knowledge of the types of soils), with an average mean score of 3.10. In addition, the following paragraphs consecutively (8, 3, 4, 6) and paragraph (I have knowledge of the needs of the plants and crops species-appropriate soils) with an average mean score of 2.62. Recent rank in need of vital information in this area.

A study by Bationo, (2009) shows that capacity building. Soil health management is knowledge-intensive and its wide adoption will require capacity building through training programs for extension workers and farmers. It will also upgrade the skills of researchers on both the national and international levels, to provide the enhanced knowledge necessary to support soil management under SCPI. Policymakers should explore new approaches, such as support groups for cooperation in air-conditioned research. Provide technical support and on-the-job training for national research institutions and translate research results into practical guidelines for small farmers. We must strengthen national capacity to undertake on-farm research, and focused on addressing spatial and temporal variability through, for example, better use of ecosystem modeling (FAO, 2008). Based on statistical analysis on these variables, the following null hypothesis can be rejected: There is a relationship between respondents on the conservation of natural resources and skills in soil conservation.

**Table-7: Distribution of Respondents According to Knowledge and Skills in soil**

No.	Skill and Knowledge in Soil	Mean	S.D.
1.	I have knowledge of the types of soils	3.10	1.00
2.	I can the estimated on the appropriate use of fertilizers and reduce the use	3.11	1.00
3.	I have knowledge in the perpetuation and preservation of soil from erosion and DRIFTS	3.03	.99
4.	I have knowledge of the use of fertilizers and organic vital useful flora and fauna does not perpetuate the necessary elements in the soil	2.95	1.04
5.	I have knowledge of the needs of the plants and crops species appropriate soils	2.62	1.05
6.	I have knowledge in the use of fertilizers with modern techniques, spraying sprinkling systems	2.92	1.11
7.	I have knowledge and skill in the soil, water needs according to its kind	3.15	.99
8.	I have knowledge and skill in the crop rotation to maintain soil fertility	3.06	.97
	<b>Correlation-r 0.375**</b>	<b>2.99</b>	<b>1.01</b>

Correlation is significant at the 0.01 level (2-tailed).\*\* (P<0.01)

### 7-Problems and Constraints Facing in the Job

The problems and constraints of extension work were arranged according to their importance from the point of view of agricultural workers. The finding of the survey is summarized in Table 8. The table shows that the level of the agricultural extension officers for all the problems and constraints for the future was the highest percent was 68.9% in the statement, “It’s a weak linkage between extension universities and research”, because the second problem was “the less effective in managing the agricultural sector” with % 45.5, which causes the weak linkage between agricultural extension and research centers. Also, there is no good policy to be related to the university to improve this sector.

Furthermore, the causes of these differences are the vertical and horizontal lines of communication in organizations, cooperation, and coordination which in turn impede appropriate communications managers that meet the organization's interest and the scattering of pending efforts, to reach appropriate solutions to problems (Saleh *et al.*, 2015). These results were achieved for the extension service for describing the problems associated with training needs in the training courses of respondents. In addition, using this field in the study of understanding which high effect on extension services and the environment around the organization will be the effect on the need training for improving and develop the performance workers (FAO, 2008). Therefore, after the last situation in Iraq, there is not enough experience in this sector and no specialization in agricultural extension. This can be explained partly by the weak interest of directors guiding organizations, administrative behavior in every level of the organization, followed by the management of the organization that would develop, as well as the dependency of organizations found more than one leading labor disruption, confusion, poor performance, practice behaviors and actions for the implementation of appropriate organization, by managers to achieve the objectives (Khan *et al.*, 2011).

**Table-8: Distribution of Respondents According to the Problems and Constraints in the Job**

No.	Problems and Constraints	Frequency	Percentage (%)	Rank
1.	Weak linkage between extension Universities and research	53	68.9	1
2.	Limited time to run a project	29	37.7	4
3.	Monitoring and evaluation of program or activities	26	33.3	5
4.	Remote area coverage	20	20	12
5.	Farmer to extension ratio	22	28.6	10
6.	Incentives/Rewards Awards	22	28.6	10
7.	Less (Limited) training Programmers	32	41.6	3
8.	Less developed physical infrastructure	22	28.6	10
9.	Weak training content and trainers	26	33.3	5
10.	One way flow of technology transfer	18	23.4	14
11.	Nepotism/Favoritism	16	20.8	15
12.	Transportation/Fuel	15	19.5	16
13.	Finance /Budgeting	19	24.7	13
14.	Non-participation of a trainee in choosing training required	24	31.1	8
15.	Less or lack of cooperation between public and private sector	21	27.3	11
16.	Risk and uncertainties	24	31.1	8
17.	Less use of modern media (ICTs)	16	20.8	15
18.	Weak training courses and preparation plans	32	41.6	3
19.	Gender discrimination	19	24.7	13
20.	Dependent on monocarp (Income Generating Activity) (IGA)	23	29.9	9
21.	Less efficiently managed sector	35	45.5	2
22.	Lack of appropriate inputs (Seed, Fertilizer, and Pesticides)	25	32.5	7

Also, that will give a clear picture of this sector to know where the problems in the work to can mention and give the recommendation to reduce and remove these problems. The middle rank of problems was 31.1%, on the statement “Risk and uncertainties”, because when the manager is changed, that will be change follow the projects in this sector, also have no evaluation, follow-up, and planning for this project. Further, this issue is very important in this sector, due to many projects in agriculture needs a long time to complete, not one growing season or two some projects need less than five years.

The lowest percentage of problem 19.5% was a “Transportation/Fuel”, that also means weak manage this sector. Further, problems and constraints in the Job were calculated on the number and percentage with the rank of respondents as can be seen in Table 8. With details on all items in these problems. Furthermore, because of the lack of employment in this sector. In addition, this gives a clear picture of this sector for a relationship with other sectors. It is very important for attention to this problem. This table can show a third problem which is the problem’s monitoring, and evaluation also because of the weakness of the managed sector. This study agrees with the study by Al-Hamdani (2013), about weak departments of the agricultural extension because of lack of proper professional specialization.

## CONCLUSION

Preserving natural resources in light of climate change is an important role in sustainable development and overcoming food shortages as well as maintaining a healthy natural environment free from any contaminants of nature. Through the results of the study, there was a clear defect in preserving natural resources, as the study showed a lack of information and knowledge in the field of preserving and regulating water use. In addition, in the field of fauna and flora, scientific recommendations must be used for the sustainable development of future generations of the reserves' natural wealth. Likewise, in the curricula, a serious focus must be placed on preserving the natural, animal, and plant sources, and other resources such as water and nature, including oil and gas, and no prejudice to the resources for future generations.

## RECOMMENDATIONS

In the light of climate change and increasing population must focus on the conservation and development of natural sources of water, vegetation, and livestock. Through the results of the study indicate an increase in water consumption through an increase in vegetation, as well as an increase in animal wealth, with the weakness of the use of modern technologies in irrigation, there must be an increase in educating farms and farmers to use modern technologies in irrigation to reduce the water demand. The need to intensify the extension courses and seminars on climate change and the need to transform sustainable development and the preservation of the natural resources of all.

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