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## **Training Needs of Agricultural Extension Agents Using Borich Needs Assessment Model**

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*This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.*

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### **ABSTRACT**

The objective of this study is to examine the training needs of agricultural extension workers in various provinces of Iraq. Validate them and develop a method of identification of training needs for agricultural extension agents. The data collected were analyzed by determination of the mean of the responses from the respondents and one-way of Variance (ANOVA). Using Borich need Assessment model for training needs, the questionnaire survey was adopted for a population of 300 professionals in clients, consultants, and contracting organizations. The majority of respondents were in all kinds of training needs were above the value of 3 meaning that all of them were strongly needed, the highest needed training was on the name of method with mean value 3.74, the moderate needed training was on use computer and ICT with mean = 3.26 and the lowest needed

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training was on the management with mean =3.15. The study revealed that the majority of respondents in the first categories in the age from 31 to 40 years 37.32%, experience from one to five years 40.94%, the number of training courses from 1 to 5 courses 39.86%, for the education level had a bachelor degree 71.74%, origin from the urban 80.80%, and attended training 81.16%, marital status 73.19%, the gender a male 63.77%, and specialization from agriculture department 71.38%. The results shows significant relationship with provinces, marital status, location of work, training, and the number of training courses. The Extension Agents agreed that they needed training in studies areas of their agriculture.

**Keywords:** *Training needs; agricultural extension agent; Borich need assessment; Iraq.*

## 1. INTRODUCTION

Today, one of the main global challenges is how to ensure food security for the world growing population whilst ensuring long-term sustainable development. According to the FAO, food production will need to grow by 70% to feed world population which will reach 9 billion by 2050. Training is one of the most useful tools in business and industry to bring the best for the employees. It is designed to help the employee familiarized with the work, developed the pride. Maintained a high standard of services, and prepared for the advancement of the work with greater responsibilities. At the same time, the challenge in the training would boost the morale, enthusiasm, loyalty and interest in the work of the employees. Training is the systematic development of the attitude, knowledge, skill, and behavior pattern required for the adequate performance of a given job or task. The weakness or absence of training agricultural extension workers after employment in planning and instructional program gave a negative effect on the success of the extension work, [1]. Education and training as agricultural extension training is intended to increase the efficiency and performance of the human element that acts responsibly in society. The training programs were based on the reality of the trainee, and various training programs commensurate with the realities while needs of the trainee, technical information and skills are required.

One of the most important functions of agricultural extension workers in social competence is an ability to communicate and collaborate with rural and farmers. This argument in line with Bennett, C.F., (1989) who stated that social efficiency of social interaction, and cooperation with farmers, has an important role in agricultural extension [2].

Agricultural extension organizations worldwide face challenges of professional competence among their employees.

Conklin, [3] highlighted that training is needed for coordinators to use a wide variety of this training could be used as incentives to improve the education service through the creative and futuristic delivery of in-service education as it gets an overwhelmingly positive response from. The study [4] showed that the training needs for extension agents in the preparation of extension work was immense. Standard training resulted in more motivation, perceived value of the training and knowledge after the training session than virtual training. But with regard to the learning transfer measured by the behavior in a real and complex situation, the virtual training was as good as the standard training [3]. Borich Needs Assessment Model is designed around the skills individuals and groups need to be effective in the future and are used for making human resources decisions." He further suggested that training programs could utilize his model by employing the two extreme positions: what are (the measured behaviors, skills, and competencies of trainees) and what should be (the goals of the training program). Note the concept of competency implied by the needs assessment model: Competencies are the application of knowledge, technical skills, and personal characteristics leading to [5].

### 1.1 Objectives of the Study

The purpose of the study was to identify and prioritize the in-service training needs of agriculture extension officers in some of the Iraqi provinces. There are several research questions that can be raised in this study. These are including:

- 1) What are the training needs of the respondents in the areas of agricultural extension?

- 2) What is the relationship between the training needs of respondents in agricultural extension work areas and socio-demographics factors including (province, work location, age, gender, marital status, origin, current residence, education level, background of family, years of work in agricultural extension, training courses attended, an experience in farming, and number of training courses)?

Specifically, the study objectives are:

- 1) To identify the training needs of the respondents in the areas of agricultural extension.
- 2) To examine the relationship between the training needs of respondents in agricultural extension work areas and social demographic factors (province, work location, age, gender, marital status, origin, current residence, education level, years of work in agricultural extension, background of family, location of work, training, an experience in farming, and the number of training courses attended).

## 1.2 Significance of the Study

One of the most important steps of training needs is in the development of performance, and factors that drive employee for continuity, and stability in employment. This work focus on the scope of training needs methods that could assist trainers, and researchers quantify and analyze the use of resources in farms and households to develop it. Such methods could also enable users to consider primarily, the likely resource-use implication, of the trainee, in implementing the possible requirement of agriculture extension for the training. Due to the role of the literature plays in the development of researcher's view about the problem and the research questions, any researcher can not deny how much does he benefit from the literature to mature his ideas about the study that he intends to carry out. Hence, in addition, to becoming acquainted with achievements of the researchers in the concerned field of interest, he may be led to determine or identify the different gaps that have not yet been addressed [6].

## 2. MATERIALS AND METHODS

This study was conducted in Baghdad, Wasit, and Babylon. The number of agricultural workers

involved in research according to the provinces Baghdad has the largest provincial agricultural extension. Around 300 of random sample of total 600 employees in agricultural extension was collected, which are including 150 person from Baghdad province and 75 persons from Babylon, and 75 employees of Wasit area. Due to the guidance department at indicative and center in Baghdad. Although Central and southern Iraq, have a large agrarian leader more staffing to a more advisory services, where there are in the Central and southern governorates of Iraq and guiding centers add to extension services in these provinces follow the guidance center (extension farms) in addition to the agriculture community. The questionnaire was tested for content and face validity by a panel of experts consisted of Agricultural Extension Educators at the Department of Education and Extension, University of UPM, Faculty of Agriculture, Malaysia. A copy of the instrument was provided to each member two weeks before they were requested to discuss it. Also, faculty of agricultural in Baghdad University, department of agricultural extension. The members were requested to judge the appropriateness of each skill and knowledge statement according to the job requirement of the agriculture officers. The first test researcher (Pre-test) (30) pilot officer within the Organization's management guidelines in Salahuddin province, "including working in agricultural extension and training service", a researcher at the test adopted by the persons involved in the management of the Organization of guided from outside the comprehensive and sample search. A field test of 6 agriculture officers (not included in the sample) was conducted before the final version was sent to the agriculture officers of the sample. Generally, the type of reliability was reported for the instrument; similar to the one used in this study, namely coefficient of consistency by calculating Cronbach's alpha using computer program "Statistical Package for Social Sciences (SPSS)". The Cronbach's alpha calculated for all skills and knowledge statement ranged from 73.4% to 96.7%. Cronbach's Alpha for various skills and knowledge areas was; knowledge and skill in plant technical (84.9%), knowledge and skill in irrigation and drainage (84.5%), and all skills above 74%. To analyzes the demographic characteristics of the respondents. It was used to describe the characteristics of the variables, in terms of their frequencies, mean, median, and percentages. Descriptive analysis is a summary of a given set of data, which can either be a representation of the entire population or a

sample. This statistics provides an understanding and natural to interpret the raw data. In this study, descriptive analysis was used to analyze the results of the survey by converting all numerical data into the pictorial form. The data were analyzed statistically using the computer software statistical package for ANOVA One-way analysis (Analysis of variance (ANOVA) provides methods for comparing several population means, that is, the means of a single variable for several populations. This type of ANOVA is called one-way analysis of variance because it compares the means of a variable for the populations that result from a classification by one other variable, called the factor). The possible values of the factor are referred to as the levels of the factor. One-way analysis of variance is the generalization to more than two population of the pooled t-procedure [7] and social sciences (SPSS), Microsoft Excel, Percentage means median, standard deviations and correlation analysis of variance and multivariate was calculated will verify the data collected from the survey and verification in order to brief them [8]. This paper reviews quantitative methods for educational and training needs assessment. Also, use categories for training needs in three categories (High, Moderate, Low) for all kind of agriculture in this study researcher. Based on the responses of the final round questionnaire, 300 respondents in this study, 16 items skills and knowledge were identified to be included in the final questionnaire. Using a five-point Likert-type scale for training needs (never needed, no need, neutral, strongly needed, very strongly needed), number 1 on the scale never needed training the least needed training and number 5 was the very strongly needed. Agricultural extension officers were asked to rate the 16 areas in the skills and knowledge related on a Likert-type scale to in-service needs. The data are then analyzed cleaned, as well as using reliability test, and descriptive analysis, factor analysis, and logistic regression analysis. Finally, data was collected, categorized and tabulated by using statistical tools. Researcher used a framework for manpower planning, Bramham, (1982) in this study at this framework in detail, it can be seen that before attempting to formulate future manpower plans, it is imperative that information should be obtained that either will dictate or will dictate or will have a vital bearing on the forecasting of manpower supply and demand. Borich Needs Assessment Model is designed around the skills individuals and groups need to be effective in the future and are used for making human resources decisions." He further

suggested that training programs could utilize his model by employing the two extreme positions: what are (the measured behaviors, skills, and competencies of trainees) and what should be (the goals of the training program) [5].

## 2.1 Training Needs

A training need is a shortage of skills or abilities, which could be reduced or eliminated by means of education and development. Training requirements hinder employees in the fulfillment of their job responsibilities or prevent an organization from achieving its objectives. They may be caused by a lack of skills, knowledge or understanding, or arise from a change in the workplace [9]. Training needs to be discovered in one department are likely to exist in others. It is pointless for individual managers to throw their own limited resources at each problem as it arises, duplicating efforts and dissipating energy. According to Borich, a need is described as a discrepancy or gap between "what is", or the present state of affairs in regard to the group and situation of interest, and "what should be", or desired state of affairs [10]. McKillip (1987) described a need as a value judgment that some group has a problem that can be solved. The extension workers, researchers, and local farmers should cooperate in the extension work, especially in the planning, implementation, and evaluation of the extension program to develop the extension service in Iraq Agriculture [11].

Several theories of training needs identification have been proposed and practiced by organizations. The three popular theories are skill-gap analysis, organizational and occupational analysis, and critical incident theory. [10] describes the skill-gap analysis as a process which involves understanding the current skill levels of those who need training in order to focus on the desired and important skills. It involves analysis of the potentials of the staff in relation to the task to be carried out, starting each task and using the professional judgments of individuals (supervisors) in determining the extent, to which the extension staff already have the skills, and developing a test or performance measures and administering them to the extension agents [11]. Training needs are computed for all items, issues, topics and skills and then ranked accordingly. These training needs can be computed for each item and also for individuals to determine their training needs, [12]. A clear distinction between the

competencies and training requirements. An analogy of training needs is like the teaching skills required by designated teachers for teaching practices. The training module is designed not only to address the shortcomings in the performance of the teachers but also to fulfill the teacher's need and to raise their competencies [13]. There are three levels to identify training needs with all of the Nadler (1982) and Rifai (1987) and Tracy [14].

### **2.1.1 Needs at organizational level**

Overall management needs, and aim to improve service levels and morale, these requirements are derived from the analysis of the objectives and priorities of the organization and are affected by economic and social realities and the prevailing political and technological environment.

### **2.1.2 Needs at job level**

They represent weaknesses and deficiencies in the job due to lack of skills and information and directions required to perform various functions and identify the problems and difficulties of functionality which can be treated with structured training.

### **2.1.3 Needs at individual level**

These requirements stem from the work of an individual, recognizable by identifying deficiencies in information and skills and individual and trends that can be developed so that individual to perform his functions well and has added, [14], that are fourth levels of training needs.

### **2.1.4 Needs at group level**

They relate to specific functional levels or certain categories of workers such as managers, supervisors, and implementing direct, and so on. And by analyzing the needs of the community may show the need for a certain type of training programs aimed at the composition of the team spirit and leadership training, supervision and problem solving.

## **3. RESULTS AND DISCUSSION**

### **3.1 Socio-demography**

Socio-professional characteristics of Agricultural extension officers: Before delving on the training need items, a socio-professional profile of the

respondents is given so that the successive discussion becomes more meaningful to the readers. The study revealed that the majority of respondents in the first categories in the age from 31 to 40 years 37.32%, experience from one to five years 40.94%, number of training courses from 1 to 5 courses 39.86%. For the education level had a bachelor degree 71.74%, origin from the urban 80.80%, and attended training 81.16%, marital status 73.19%, the gender a male 63.77%, and specialization from agriculture department 71.38%. As shown in Table 1. The relationship between social demography and training needs in this study, that's a significant relationship between, province, social status, education level, location of work, training, and number of training, with training needs at level 0.05. And another variables that is non-significant, used one way ANOVA and Chi-square analysis.

### **3.2 Training Needs / Group Process Skill; Plant Technical Skill and Knowledge**

Table 2 indicates that the highest needed training in the first area was on the statement "I can develop of fertilization schedules and methods" with mean 3.44. Methods were important in order to get the maximum yield of the crop and at the same controlling the effect to the environment while a good schedule would help in determining the exact time of fertilization process as each fertilizer and its method has their own life cycle. The moderate needed training was on the statement "skill to identify the insect-resistant crops" with mean 3.35 while the lowest needed training was on the statement " skill in making crop planting schedule and activities" with mean 3.14. However, all statement of training needs was above the value of 3, meaning that all of them were strongly needed. The next step is to determine the degree of training needs. Determination of the degree of training needs was based on Likert scale format, which originally has five rating positions [13]. Therefore, for the purpose of identifying the degree of training needs, the values of mean differences were used. The researcher adopted the five-point Likert scale approaches in determining the degree of training needed.

The following categories, as stated in Table 2 were decided upon for the interpretation of the degree of training need for each skill based on the mean differences. However, all kinds of training needs were above the value of 3, meaning that all of them were strongly needed.

However, if the need falls in the high need category, there is a high need for training. High degree of training need also shows that there is an obvious discrepancy in performance. This implies the agricultural extension officers should be given more training. Finally, critical need reflects that an agricultural extension has low or no attainment in specified skill.

Therefore, the agricultural extension should be provided with the specific training program

immediately. The study of [15] indicated that all the respondents placed a high emphasis on training related to major crops production technology, post-harvest technology, and market information for these products. They expressed little need in training about plant protection and farm mechanization. Moreover, it must be reminded that the explanations of the degree of training needs are explained in terms of the importance and attainment quadrant as

**Table 1. Summary of the correlation analyses of the relationship between social demographic, variables factors with training needs**

No.	Independent variables	Significant	Decision
1.	Province	0.029*	* (P<0.05) – Significant
2.	Age group (year)	0.318	Non- significant
3.	Gender	0.067	Non-significant
4.	Experience	0.064	Non-significant
5.	Marital status	0.007*	* (P<0.05). Significant
6.	Education level	-0.119*	Non- significant
7.	An experience in farming	0.686	Non-significant
8.	Specialization	0.636	Non-significant
9.	Background of family	0.703	Non-significant
10.	Origin	0.632	Non-significant
11.	Location of work	0.007*	* (P<0.05). Significant
12.	Training	0.043*	* (P<0.05). Significant
13.	Number of training	0.149*	* (P<0.05). Significant

**Table 2. Distribution of respondents according to plant technical skill and knowledge**

No.	Statements	Mean	S.D
<b>Plant technical skill and knowledge</b>			
1.	I can making crop planting schedule and activities	3.14	1.05
2.	I have a skill in crop management	3.22	1.08
3.	I have a skill to identify the insect-resistant crops	3.35	1.08
4.	I have skill about the diseases and pest in crops	3.38	1.12
5.	I have a skill how to select the right plants for farms	3.22	1.12
6.	I have a skill how to use the pesticides and weedicides	3.37	1.07
7.	I know crop rotation	3.27	1.06
8.	I know how to identify the stages of flowering season and ripening plants	3.20	1.09
9.	I know how to identify the weeds and how to weeding	3.19	1.12
10.	I know about integrated crop management	3.42	1.02
11.	I know about postharvest losses and ripeness	3.32	1.07
12.	I can identify suitable land for cultivation	3.34	1.10
13.	I know the herbicide-resistant crops	3.39	.99
14.	I have knowledge in storage the seeds and moisture content and storage conditions	3.37	1.12
15.	I can develop fertilization schedules and methods	3.44	1.07
<b>Total average mean</b>		<b>3.31</b>	

(1= Never Needed, 2= No Need, 3 = Neutral, 4= Strongly Needed, 5 =Very Strongly Needed. N=276)

mentioned below. The relevant degree of training needs implies that there is a fair need for training. The relevant degree of training need indicates more weigh stage compared to the medium need for training. In this case, there is a need for training although the need might not be urgent.

### 3.3 Knowledge and Skill in Irrigation and Drainage

Table 3 shows on the training needs that the highest average means 3.30, in training needs of the field in irrigation and drainage skills, the highest needed training was on the statement, "I know about modern irrigation systems design important", that means when employees know to design the irrigation systems it will have information and knowledge very good in this part because this will be open way in another. The moderate needed training was on the statement, "I know the quantity of water consumption for soil and plant" with average mean 3.22.

The lowest needed training was on the statement "I know water conservation" with the averages mean 3.07 because this statement, not important seam first statement this skill is very easy and all employees have some information and knowledge. Due to the great water shortage in Iraq during recent years due to the legalization of the use of water, add 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 [16]. AEAs' in-service programs should focus on agricultural waste management extension,

participatory technology development, and water conservation methods.

### 3.4 Knowledge and Skill in Fertilization

The findings of the survey in Table 4 indicated that the highest needed training was on the statement, "I know the needs of plants according to the types of fertilizer" with average mean 3.31, because when employees know the plant what need from types of fertilizer it will be know all fertilizer when and how can use for any plant. The moderate needed training was on the statement, "I know how to take safety measures when using fertilizers and fertilization" with average mean 3.25, and the lowest needed training was on the statement, "I know about the types of fertilizers and sources", with mean 3.16.

That fertilizer is available in the local market are known to everyone and is used for many years is because of fertilizer need fertilizer by soil type and the Iraqi unknown what needs major fertilizer farms available in the local market, that means the least need for information in this part. However, all statement of training needs were above the value of 3, meaning that all of them were strongly needed at the Skill in Fertilization. These correspond to this study in terms of training needs in the Knowledge and Skill in Fertilization. According to [16] the findings of this study for the training on the technique to reduce the use of fertilization chemicals is very important. Also, the study of [17] findings high needs for training about the fertilizer requirement of major crops.

**Table 3. Distribution of respondents according to knowledge and skill in irrigation**

No.	Statements	Mean	S.D
<b>Knowledge and skill in irrigation and drainage</b>			
1.	I know to identify the sources of irrigation and drainage	3.28	1.09
2.	I can choose appropriate water for irrigation and appropriate irrigation systems	3.21	1.13
3.	I know about modern irrigation systems design	3.30	1.07
4.	I know how to irrigation scheduling	3.20	1.12
5.	I know how to choose the right time for irrigation	3.11	1.25
6.	I can choose the needed parts for irrigation	3.28	1.15
7.	I know maintenance of irrigation systems	3.22	1.13
8.	I know evaluation of irrigation system	3.29	1.13
9.	I know the quantity of water consumption for soil and plant	3.22	1.12
10.	I know water conservation	3.07	1.19
11.	I can select plants according to their need for water	3.16	1.13
12.	I know how to choose good water for irrigation from wells (Groundwater) in the absence of natural water (fresh water)	3.24	1.18
<b>Total average mean</b>		<b>3.21</b>	



**Table 4. Distribution of respondents according to knowledge and skill in fertilization**

No.	Statements	Mean	S.D
<b>Knowledge and skill in fertilization</b>			
1.	I know about the types of fertilizers and sources	3.16	1.13
2.	I can use fertilizers appropriately	3.23	1.13
3.	I know the programs and schedules of fertilization	3.29	1.07
4.	I know how to reduce the use of fertilizers	3.21	1.15
5.	I know the needs of plants according to the types of fertilizer	3.31	1.08
6.	I know the use of fertilizer with modern techniques (fertilized, spray and drip system)	3.26	1.13
7.	I know how to storage the fertilization	3.20	1.09
8.	I know how to take safety measures when using fertilizers and fertilization	3.25	1.18
9.	I know how to use of organic fertilization	3.24	1.18
<b>Total average mean</b>		<b>3.24</b>	

### 3.5 Knowledge and Skill in Management

The result of the analysis is shown in Table 5 it was found that the management skills for all respondents were the highest needed training was on the statement on "I know that analytical skill can improve through training" with average mean 3.32. because when employees can do this skill it will doing any duties in this part also, this skill very difficult from another skill in this part. The moderate needed training was on the statement "I have records for each agricultural operation" with mean 3.14, this statement does and responsible for all employees.

The lowest needed training was on the statement, "I can write reports" with average mean 2.99 because all employees have experience from your study to can write reports. That means for the scale was indicated in strongly needed skills. Also, if he or she don't know in some field it will learn from his colleagues. Study of [18] management skills

came last in terms of the need for training at an average 3.31 this is consistent with the current study.

### 3.6 Knowledge and Skill in Animal Husbandry

The result of the analysis is shown in Table 6. From this Table, it was found that the highest needed training was on the statement "I know the type of fodder during growth stages and the stages of pregnancy for big animals" with average mean 3.46. This means when any employee knows fodder during growth stages it will be can treatment the animals because this question very important in this part to give employees all information, knowledge, and skills to give advice important for farmers. The moderate needed training was on the statement, "I know the methods of prevention and treatment of spread diseases and epidemics that infect animals" with average mean 3.33, and the lowest needed training was on the statement,

**Table 5. Distribution of respondents according to knowledge and skill in management**

No.	Statements	Mean	S.D
<b>Knowledge and skill in management</b>			
1.	I know how to use the computer at work	3.10	1.36
2.	I know the methods of data collection, disaggregation, and elementary statistics work	3.23	1.18
3.	I have records for each agricultural operation	3.14	1.15
4.	I can supervise the operation and maintenance of projects within my area	3.13	1.16
5.	I can write reports	2.99	1.29
6.	I can identify accounts for payment of dues for contractors	3.17	1.18
7.	I can develop appropriate proposals for improving performance in my business website	3.08	1.14
8.	I can interpret financial data, reports, balance sheets and cash flow analysis	3.31	1.15
9.	I know that analytical skill can improve through training	3.32	1.22
<b>Total average mean</b>		<b>3.15</b>	

**Table 6. Distribution of respondents according to knowledge and skill in animal husbandry**

No.	Statements	Mean	S.D
<b>Knowledge and skill in animal husbandry</b>			
1.	I know there is a relationship between animal nutrition and animal gender and age	3.25	1.23
2.	I know the animal health status, setting growth, mating, and production	3.38	1.14
3.	I know the environmental conditions and their relation to animal feed	3.24	1.19
4.	I know the proteins, carbohydrates, and energy in animal food	3.33	1.15
5.	I know the proportion of coarse fodder, feed, and intensive nutrition	3.28	1.15
6.	I know the types of mixed fodder used in animal feed	3.41	1.13
7.	I know the type of fodder during growth stages and the stages of pregnancy for big animals	3.46	1.16
8.	I know the type of feed given to animals before and after vaccination	3.26	1.18
9.	I know the planning for milk production benefits and its relationship to the feed given to the animals	3.25	1.17
10.	I know the diseases and parasites that infect animals	3.28	1.18
11.	I know the methods of prevention and treatment of spread diseases and epidemics that infect animals	3.33	1.19
<b>Total average mean</b>		<b>3.32</b>	

"I know the environmental conditions and their relation to animal feed" with average mean 3.24, because this statement the last skill and knowledge in this part when any employee need to improve your skills in animal husbandry, need to ask for specialized skills.

The research findings in the study [19] highlighted that there is demand for upgrading the awareness of members in dairy marketing as well as the organization of effective training programs to the needy group. With regard to extension officers in animal husbandry department first, training which includes farming and breeding management, as well as content

delivery, is critically needed to enable Agricultural Extension Officers to become better and more relevant in performing their duties [20].

### 3.7 Knowledge and Skill in Machines and Equipment

The result of the analysis is shown in Table 7 From this Table, it was found that the highest needed training was on the statement, "I know about maintenance and change of the broken parts in the agricultural machinery" with average mean 3.35, that lead if the employee can maintenance or change the part in the agricultural machinery it will know many skill and

**Table 7. Distribution of respondents according to knowledge and skill in machines and equipment**

No.	Statements	Mean	S.D
<b>Knowledge and skill in machines and equipment</b>			
1.	I can learn about agricultural machinery types and their uses	3.12	1.12
2.	I can identify and control spraying machines (Sprayer and water pumps)	3.19	1.11
3.	I know how to choose the appropriate agricultural machinery (for fertilizers, seeds, and harvest)	3.18	1.14
4.	I know how to use machines for leveling and tilling machines, smoothing and calibrated	3.17	1.13
5.	I can describe the maintenance procedure of farm machinery	3.24	1.06
6.	I know how to develop a list of modern machinery required for the big model farm	3.30	1.10
7.	I know about maintenance and change of the broken parts in the agricultural machinery	3.35	1.05
8.	I can identify ways of storing machinery and agricultural machinery	3.30	1.13
9.	I can describe the use of various agricultural hand tools and implements	3.15	1.13
<b>Total average mean</b>		<b>3.22</b>	

information in machines and equipment. The moderate needed training was on the statement, "I can describe the maintenance procedure of farm machinery" with average mean 3.24.

The lowest needed training was on the statement, "I can learn about agricultural machinery types and their uses" because this statement will be last skills important. Finding in the study [15] indicated that all the respondents placed a high emphasis on training related to major crops production technology, and farm mechanization. The most training needed regarding mechanized farming in Punjab for agricultural officers were. The ability to operate modern machines, equipment, and implements [21].

### 3.8 Knowledge and Skill in Plant Protection

The result of the analysis is shown in Table 8. From this Table, it was found that the highest needed training was on the statement "I know the specifications of vegetables which are grown in greenhouses and know the appropriate time of cultivation of seedling production" with average mean 3.29, this means when employees able in specification of vegetables it will have knowledge and skills in all this part because he or she have specific information when got it this information, and skills it able to give advice write for farmers.

The moderate needed training was on the statement, "I know about the weed management". The lowest needed training was on the statement "I know about the proper irrigation system of protected agriculture" with

average mean 3.10 the last as the viewpoint of provincial respondents discussed, that means the irrigation in this system not difficult because before distribution the greenhouse give the employees many training courses to give him new knowledge and information to get high production. Study of [22] shows that it is evident from the mean scores that the plant growers perceived the most needed training areas in order "Plant protection measures.

### 3.9 Knowledge and Skill in Plant Horticultural Crops

The result of the analysis is shown in Table 9. It was found that the highest needed training was on the statement, "I can describe agricultural recommendations regarding floriculture" with means 3.32, because when the employees know the recommendations it will be able to explain this information and skills for the farmers this first skills in this part very important to give the employees competence in your work.

The moderate needed training in plant horticultural crops was on the statement, "I can describe agricultural recommendation regarding fruit crops" with the average mean 3.26, and the lowest average mean at the statement, "I can describe agricultural recommendations regarding vegetable", with average mean 3.07, that means the employee when he or she know the recommendation can describe that because if that employee has knowledge or skills it will be able to describe it. According to the study of [23]. The present findings should be trained in the horticultural related activities as

**Table 8. Distribution of respondents according to knowledge and skill in plant protection**

No.	Statements	Mean	S.D
<b>Knowledge and skill in plant protection</b>			
1.	I know about the process of trimming vegetables	3.14	1.19
2.	I know about plant protection measures	3.21	1.14
3.	I know how to eliminate the diseases and insects that infect vegetables	3.22	1.11
4.	I know the specifications of vegetables which are grown in greenhouses and know the appropriate time of cultivation of seedling production	3.29	1.15
5.	I know about the soil and field preparation	3.16	1.21
6.	I know about the proper irrigation system of protected agriculture	3.10	1.15
7.	I know about high yielding varieties	3.14	1.08
8.	I know about the weed management	3.21	1.10
9.	I can create and install plastic houses	3.19	1.17
10.	I know about harvesting	3.16	1.20
11.	I know about relevant climate information and windbreak	3.22	1.21
<b>Total average mean</b>		<b>3.18</b>	

**Table 9. Distribution of respondents according to knowledge and skill in plant horticultural crops**

No.	Statement	Mean	S.D
<b>Knowledge and skill in plant horticultural crops</b>			
1.	I can describe agricultural recommendations regarding vegetable	3.07	1.05
2.	I can describe the plant protection measures and get the highest productivity	3.19	1.03
3.	I can explain the latest technology regarding getting better production of vegetables	3.30	1.04
4.	I can describe agricultural recommendation regarding fruit crops	3.26	1.02
5.	I can describe agricultural recommendations regarding floriculture	3.32	1.04
6.	I know the major insect pests and diseases and fungal fruit and vegetables	3.12	1.08
7.	I know the postharvest handling, including cooling, cleaning, sorting and packing	3.21	1.04
8.	I have skill in the management of horticultural crops and get higher productivity	3.29	1.08
<b>Total average mean</b>		<b>3.22</b>	

the demand for fruits, vegetables and flowers are increasing and there is an increasing pressure on horticulturist to produce more fruits.

### 3.10 Technical Training in Horticulture and Plant Science

#### 3.10.1 Knowledge and skill in insect and diseases

Data in Table 10 shown the distribution by number and percentage of the type of extension work that was involved by the respondents while working with the various officers in Iraq. Results Table 10 shown that the highest needed training was on the statement, "I know how to determine the concentration of the pesticide used to control diseases and insects" with the average mean 3.33. The middle average mean at the statement,

"I can choose the appropriate pesticide by injury case", and the lowest needed training was on the statement, "I know about common diseases in your area, with the average mean 3.08. Because the employee it will ask for any information in your specific job to able respond for any question from colleagues or another office and farmers". According to [9] the agricultural engineers and technicians need training needs in the field of insects, daises control, and machinery equipment were high. The mean for each skill ranged higher than 3.66.

#### 3.10.2 Knowledge and skill in integrated pest management (IPM)

Results Table 11 findings that the highest needed training in IPM at the statement, "I know about biological control of the pests in IPM", this

**Table 10. Distribution of respondents according to knowledge and skill in insect and diseases**

No.	Statement	Mean	S.D
<b>Knowledge and skill in insect and diseases</b>			
1.	I know about common diseases in your area	3.08	1.15
2.	I know about natural pest enemies	3.21	1.12
3.	I know differentiation of infected insects and diseases	3.14	1.15
4.	I know about methods of control of insect and pest	3.26	1.09
5.	I know about the distinction between harmful and beneficial insects	3.22	1.13
6.	I can how the life cycle of the insect	3.29	1.19
7.	I can choose the appropriate method for control of life cycle of insects	3.32	1.13
8.	I can choose the appropriate pesticide by injury case	3.24	1.16
9.	I know how to determine the concentration of the pesticide used to control diseases and insects	3.33	1.14
10.	I know how to take safety precautions when using pesticides	3.11	1.15
11.	I know how to identify the plant diseases and insect pests of horticultural damaging	3.27	1.17
<b>Total average mean</b>		<b>3.22</b>	

statement very important in IPM need to leave used the chemical pesticides, because that is effect in our health not use that for every time, with the average mean 3.52.

The moderate needed training was on the statement, "I know the time of application, freq, method and amounts", with the average mean 3.36, and lowest needed training was on the statement, "I can identify major crop insect pests in IPM", with the average mean 3.06. Indicated study of [24]. That strongly needed for training in IPM. These correspond to this study in terms of training needs at IPM.

### 3.11 Perception of Knowledge and Skill in Extension Philosophy

The result of the analysis is shown in Table 12. From this Table, it was found that the highest needed training on the statement, "I can distinguish the types of behavioral changes" and, "I understand the extension philosophy and methods" with the average mean 3.31. The moderate needed training was on the statement "I know about the methods for winning farmers' confidence", with the average mean 3.26. The lowest needed training was on the statement, "I know and understand extension policies in Iraq" with the average mean 3.17. Described as a lack of specialized staff in performing instructional philosophy in all come. Can be

attributed to the lack of preparation of mentors and guides in all departments who guidelines to many reasons variety come primarily lack of recruitment specialists and not care for the new graduates of the agricultural extension department of the agricultural colleges in Iraq. Indicated study of [24]. That strongly needed for training in the extension philosophy. These correspond to this study in terms of training needs in the extension philosophy. That means the need for training in agricultural extension philosophy, organization, and administration viewed by the extension agents.

### 3.12 Perception toward Knowledge and Skill in Computers and ICT

The result of the analysis is shown in Table 13. From this table, it was found that the highest needed training was on the statement, "I can use FrontPage", and "I can analyze data through Minitab" with the average mean 3.41. The moderate needed training was on the statement, "I can use Microsoft PowerPoint presentation Software for my job" with the average mean 3.30. The lowest needed training was on the statement, "I can identify major parts of the computer", with the average mean 3.03, the last as the viewpoint of provincial respondents discussed. This shows that the extension staff has agreed that these items need to be put in place for extension services to improve.

**Table 11. Distribution of respondents according to knowledge and skill in IPM**

No.	Statement	Mean	S.D
<b>Knowledge and skill in integrated pest management (IPM)</b>			
1.	I know pesticide safety in IPM	3.06	1.17
2.	I can mix pesticide (calculate concentrations) in IPM	3.33	1.06
3.	I know how to keep record of pesticide in IPM	3.22	1.17
4.	I know how to choose the correct pesticide in IPM	3.34	1.08
5.	I know the difference of pesticides in IPM	3.34	1.14
6.	I know time of application, freq, method and amounts	3.36	1.11
7.	I know the difference between pre and post emergent pesticides in IPM	3.37	1.11
8.	I know how to manage the pesticide in IPM	3.30	1.11
9.	I can carry out field sampling for insects, diseases, weeds in IPM	3.23	1.19
10.	I can differentiate fungal, viral and bacterial diseases in IPM	3.42	1.09
11.	I can identify major crop insect pests in IPM	3.40	1.11
12.	I can identify major crop diseases in IPM	3.36	1.12
13.	I can identify major weeds in IPM	3.34	1.15
14.	I can identify pests in IPM	3.36	1.17
15.	I know about biological control of the pests in IPM	3.52	1.07
16.	I know about chemical, cultural, and biological pest control options in IPM	3.39	1.15
<b>Total average mean</b>		<b>3.33</b>	

**Table 12. Distribution of respondents according to knowledge and skill in philosophy of agricultural extension**

No.	Statement	Mean	S.D
<b>Knowledge and skill in integrated philosophy of agricultural extension</b>			
1.	I know about the foundations and principles of adult education	3.21	1.10
2.	I know and understand extension policies in Iraq	3.30	1.03
3.	I can define the tasks, duties, and objectives of agricultural extension	3.27	1.11
4.	I know the needs of the rural population in the process of education	3.22	1.11
5.	I know about the principles and theories of learning	3.17	1.10
6.	I know about the principles of agricultural extension	3.24	1.11
7.	I understand about the extension philosophy and methods	3.31	1.06
8.	I know about the methods for winning farmers' confidence	3.26	1.11
9.	I can distinguish the types of behavioral changes	3.31	1.06
10.	I understand the role of extension in the development of people	3.30	1.11
11.	I understand the philosophy of planning, implementation, and evaluation of extension programs	3.23	1.07
12.	I understand about curricula indicative of service to farmers	3.22	1.08
13.	I know about the principles of urbanizing and developing the countryside	3.26	1.13
14.	I understand about the program for the development of rural women and girls	3.28	1.13
15.	I understand about the program for the development of rural youth and juveniles	3.24	1.10
<b>Total average mean</b>		<b>3.26</b>	

**Table 13. Distribution of respondents according to knowledge and skill in ICT and computer**

No.	Statement	Mean	S.D
<b>Knowledge and skill in ICT and computer</b>			
1.	I can identify major parts of computer	3.03	1.38
2.	I can conduct training courses on computer and ICT	3.09	1.21
3.	I can describe the use of computer in agricultural extension	3.08	1.25
4.	I can use Microsoft word	3.08	1.37
5.	I can use Microsoft Excel, Spreadsheets	3.28	1.30
6.	I can use Microsoft PowerPoint presentation Software for my job	3.30	1.22
7.	I can use Anti-virus program	3.20	1.19
8.	I can analyze data through the Statistical Package for Social Sciences SPSS	3.34	1.15
9.	I can analyze data through Minitab	3.41	1.21
10.	I can handle Software package	3.36	1.17
11.	I can handle Hardware problems	3.35	1.17
12.	I can use FrontPage	3.41	1.14
13.	I can use Microsoft Outlook for e-mail	3.29	1.21
14.	I can use Computer Scanner and Printer	3.24	1.32
15.	I can use the Internet, and use a search engine such as Yahoo or Google, with extension services and other beneficiaries	3.18	1.30
16.	I can determine the maintenance requirement of computer and its accessories	3.40	1.17
17.	I can prepare the programs of Television and Radio for beneficiaries	3.36	1.15
<b>Total average mean</b>		<b>3.26</b>	

Also, need to focus on this item because new all work need use computer and ICT all new employees need to attend courses in use this new technology the needs relating to knowledge of technological resources in the personal-professional area are higher. Conversely, everything relating to integrating ICT into their

teaching presents a lower level of demand. Study of [25] shows the personal and contextual factors have a complex influence on the structure and relations of competencies and ICT use. Indicated study [26], that basic applications and the Information and Communication Technologies dimensions were those for which teachers

requested a higher level of training, From the findings of the study it was observed that business skills namely ability to use network technology and ability to use ICT for business operation were below average for both successful and unsuccessful enterprises. So that skills in these areas have to be delivered to crystallize the performance of successful and to enable the unsuccessful enterprise to transform to a better position.

### 3.13 Program Planning, Implementation, and Evaluation

Table 14 findings of the survey that the highest needed training was on the statement "I know how to conduct impact studies which determine long-term effectiveness and accountability", with the average mean 3.36 with a standard deviation of 1.11. The moderate needed training was on the statement "I know how to divide the indicative activities to be accomplished in the subsidiary activities plan" with the average mean 3.31 and with a standard deviation of 1.10, and this result can be attributed to many reasons, first of the blurring of the qualities and characteristics of the objectives of the Organization, which does not apply and what is required to achieve the objectives of the organization. As well as not allowing to participate in the discussion of the

objectives of the organization by managers. The lowest needed training was on the statement, "I know how to identify indicative targets to be achieved" and "I know how to identify the target audience and their participation in the preparation of the action plan" with the average mean 3.17 and a standard deviation of 1.17, and 1.16, this means last as the viewpoint of provincial respondents discussed.

This result can be attributed to many reasons, first of weaknesses using criteria when making a calendar or measurement after control of extension work waiting, use to solve problems and self-tuning subordinates but used for punishment and be present at all times to punish, not to ensure control in changing attitudes and amend deficiencies in work and tackling problems related to sources of information on extension work, but used for the purpose of spying on employees than on monitoring and evaluation. Indicated study of [24].

However, all statement of training needs were above the value of 3, meaning that all of them were strongly needed at the skills in program planning, implementation, and evaluation. These correspond to this study in terms of training needs in the Knowledge and Skills in Program Planning, Implementation, and Evaluation.

**Table 14. Distribution of respondents according to knowledge and skills in program planning, implementation, and evaluation**

No.	Statements	Mean	S.D
<b>Program planning, implementation, and evaluation</b>			
1.	I can evaluate an extension program and develop evaluation plans	3.32	1.12
2.	I can write program objectives	3.33	1.17
3.	I know how to identify indicative targets to be achieved	3.17	1.15
4.	I know how to identify the material and human needs of every instructional activity	3.21	1.13
5.	I can prepare an annual plan of work for area of responsibility	3.21	1.12
6.	I know how to divide the indicative activities to be accomplished in the subsidiary activities plan	3.31	1.10
7.	I know how to identify the target audience and their participation in the preparation of the action plan	3.17	1.16
8.	I know the placement and time of the implementation of the indicative activity	3.24	1.15
9.	I know how to identify the target audience and their participation in the preparation of the action plan	3.29	1.11
10.	I know how to conduct impact studies which determine long-term effectiveness and accountability	3.36	1.12
11.	I know how to organize content extension	3.36	1.09
<b>Total average mean</b>		<b>3.27</b>	

### **3.14 Teaching Methods: Training Methods Using to Provide Service**

Agriculture officers themselves rated the name of method importance of those competencies for the job. The data concerning the possessed and importance levels of competencies regarding extension teaching method presented in Table 15 indicated that the highest needed training was on the statement "Conduct a field trip", with the average mean 4.07.

The moderate needed training was on the statement, "Discussion", with the average mean 3.81. The lowest needed training was on the statement, "Games and Exercises" with the average mean 3.44. However, all statement of training needs were above the value of 3, meaning that all of them were strongly needed at the skills these correspond to this study in this item was first of need the training because the name of methods very important for all employees to give them information for job performance, also these used in the name of method maybe not understand the employees need to use method stable for the employee to can save this information, knowledge and skill, and new technology.

This is in line with the view of study of [15] all respondents answered "very much needed" and "quite needed" for the training in extension teaching methods, principles of extension" and "the teaching-learning process, that means agree with this study, due this study the first of training needs.

### **3.15 Perception toward Business Skills and Knowledge**

#### **3.15.1 Customers service skills**

The result of the analysis is shown in Table 16 it was found that the highest needed training in the business job skills with the customers was the statement "The marketing plan work and to manage them effectively", with the average mean 3.76. The moderate needed training was on the statement "Becoming more effective in satisfying customer needs" with the average mean 3.51.

The lowest needed training was on the statement "Understanding who the department's customer is and communicates that priority consistently", with the average mean 3.42. As the viewpoint of

provincial respondents discussed. The study of [27] shows the milk produced availability of marketing information and indebtedness of the members was positively and significantly at level 0.05 associated with the training needs.

According to the [28] indicated that primary occupation had a significant relationship with marketing extension needs since the primary occupation of most respondents was farming and will, therefore, need the assistance of extension agents in handling increased productivity which comes from the cultivation of improved varieties. Therefore, agricultural marketing techniques should be incorporated into agricultural extension delivery packages to ensure continuous farming practices and adoption of innovations.

#### **3.15.2 Business skills**

Results Table 17 indicated that the second dimension of the business job skills its Commercial the highest needed training was on the statement "Ability to manage agricultural marketing by understanding the market", with average mean 3.71. The moderate needed training was on the statement "Business skills can improve through training", with the average mean 3.66. The lowest needed training was on the statement "Aligning resources to meet the business needs of the organization "with the average mean 3.55. As the viewpoint of provincial respondents discussed. Review of training need [29] the market information in level need very strongly at average mean=3.65. This shows that majority of the extension workers agreed with the fact that all the items listed are some of the challenges they are facing, so these things need to tackle by the government through the ADP's. This implies that many of them had access to marketing information through traders and this further shows the reason for the extension to assist in the area of marketing so that farmers are encouraged to adopt innovations.

According to the [26] indicated that on the business skills was (mean of 3.83 with the s/d of 0.81), This means that these business skills play a pivotal role for their better performance. Indicates that (61%) of the respondents had access to marketing information from other farmers, the majority (85.7%) from traders, and 2.9% obtained from the extension agents. This implies that many of



**Table 15. Distribution of respondents according to the name of methods**

No.	Statement	Mean	S.D
<b>Name of methods</b>			
1.	Lectures	3.50	1.15
2.	Discussion	3.81	1.13
3.	Problem-solving discussion	3.87	1.20
4.	Participatory technique	3.84	1.00
5.	Simulation Technique	3.64	1.01
6.	Role playing	3.59	.96
7.	Critical incident	3.46	.95
8.	Demonstrations/Field days	3.68	1.04
9.	Games and Exercises	3.45	1.06
10.	Brainstorming	3.79	1.04
11.	Conduct a field trip	4.07	.99
12.	Conduct group discussion among farmers	3.97	1.09
13.	Arrange agricultural expert as a resource person in agricultural extension situation	3.94	1.11
<b>Total average mean</b>		<b>3.74</b>	

**Table 16. Distribution of respondents according to customers job skills and knowledge**

No.	Business job skills and knowledge	Mean	S.D
<b>Customers</b>			
1.	Understanding who the department's customer is and communicates that priority consistently	3.42	1.01
2.	Becoming more effective in satisfying customer needs	3.51	.99
3.	Pursuing the best customer-focused responses that add value to the business	3.50	.98
4.	Customer skill can improve through training	3.69	1.03
5.	The marketing plan work and to manage them effectively	3.76	1.04
<b>Total average mean</b>		<b>3.58</b>	

**Table 17. Distribution of respondents according to commercials job skills and knowledge**

No.	Business job skills and knowledge	Mean	S.D
<b>Commercials</b>			
1.	Aligning resources to meet the business needs of organization	3.55	.95
2.	Understanding the costs, profits, markets and added value of the department and how those contribute to the success of organization	3.70	1.02
3.	Successful marketing managers need have analytical minds	3.59	1.07
4.	Anticipating marketplace opportunities and supports speed to market	3.64	1.02
5.	Business skills can improve through training	3.66	.97
6.	Ability to manage agricultural marketing by understanding the market	3.71	1.09
<b>Total average mean</b>		<b>3.64</b>	

them had access to marketing information through traders and this further shows the reason for the extension to assist in the area of marketing so that farmers are encouraged to adopt innovations.

#### 4. CONCLUSION

The above studies clearly show that there is a need for training in multiple areas in the

agricultural sector. Many studies have gathered support for the benefits of training for organizations as a whole. These benefits include improved organizational performance (e.g., Planning and evaluation, Skill and Knowledge in agricultural extension, Management, Name of method, use computer and ICT) as well as other outcomes that relate directly (e.g., reduced costs, improved quality, and quantity) or indirectly (e.g., employee turnover, organization's reputation,

social capital) to performance. It could be that a training need is limited to a single individual or activity but it is more likely to be relevant for a number of people, a whole department or across the organization. As the training needs of extension personnel changed over time, training needs assessment should also be done on a regular basis and the important areas in which the extension personnel needs training should be considered while planning training for the extension personnel. In addition to training needs that emerge as a result of an appraisal interview, a worthwhile approach to investigating one-off problems is to interview staff and customers. Regularly ask a random sample of employees for their views on the same set of questions relating to general performance.

## 5. RECOMMENDATION

The need for technical changes into account in identifying training needs and effective modern methods for developing organizational performance in your organization so that it is based upon the rules of sound scientific and accurate and in-depth studies to ensure success and continue to provide services. The need for the outcome of previous sessions and analysis activities approved compared with career goals when training needs. The need to address all constraints and problems facing the training process through (work analysis, analysis of the individual), which led to low productivity and lack of performance of work required, and removed and learn the right ways to solve for the discovery of reasons is part of the solution. Need to compare performance levels before the process of identifying training needs and after selecting and implementing training programs. Intensive studies on how to determine training needs, training needs identification models in other organizations and choose what best fits the circumstances of the particular organization. Emphasize the importance and role of human resources development as one of the strategies that can be adopted by organizations in improving job performance. Also, we should study in all areas in agriculture.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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