

Knowledge needs of agricultural employees working in Nineveh Agriculture Directorate in field of production fodder azula used in feeding farm animals

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abstract

The main goal of the current study was to determine knowledge needing levels of agricultural employees working in Nineveh Agriculture Directorate in field of producing fodder azula used in feeding farm animals. In general, arranging its paragraphs depending on significance and finding the association among cognitive demand of agricultural employees along with some independent factors. This investigation involved all agricultural employees in Nineveh Agriculture Directorate, numbering (310) employees. A randomly sample inclusive of 30% of employees has been chosen, resulting in a sample size of 93 workers. Data have been gathered using a questionnaire, and the questionnaire's face validity was verified, with reliability calculated using Facronbach's method. For analyzing data, mean, Spearman's rank correlation coefficient, along with Pearson's simple correlation coefficient have been applied. The outcomes of the current study showed that (9.68%) of the respondents have little knowledge need, The highest percentage (50.54%) of respondents is in the middle category , This is followed by a percentage of (39.78%) of the respondents whose knowledge need is great in production fodders azula field used in feeding farm animals. A significantly association is present among degrees of knowledge needing of those workers in field of production of fodder azula used in Feeding farm animals. A relationship was also found between years of service in agricultural work and age. However, statistically non-significant relationship was observed between knowledge needing and other variables, such as academic qualifications, specialization in agricultural extension, sex, and sources of details linked to cognitive need of studied workers in the field of producing azula feed used in feeding farm animals. The researcher reached the most important conclusions, which are that agricultural employees suffer from a large knowledge gap in production fodders azula used in feeding farm animals. The most important recommendation of the current study is to hold training courses for workers in agriculture field in order to increase their information and their level of knowledge in the field of producing azula feed used in feeding farm animals. Through collaboration with College of Agriculture&Forestry and coordination with Directorate of Agriculture in Nineveh, its agriculture's divisions, along with agricultural guidance and train centers

introduction

The agricultural sector faces increasing challenges as a result of climate change, soil degradation, and the unsustainable use of agricultural chemicals [15] at the global level. The world's populations are escalating at alarming rates, lessening the area of agricultural land by time. In modernistic world, with technology advancement, changes in lifestyle, work habits, alongside eating routines are leading to an escalation in occurrence of dangerous infections and illnesses in all living organisms [11]. One consequence of this technological advancement is rising costs of animal feeds, which are regarded crucial contributors to livestock section. Thus, increasing needs are present for finding naturally sources for feed components have high levels of protein [13]. Which highlights the need for environmentally friendly solutions. He has excelled in this field Azolla plant as a multifunctional resource for sustainable agriculture and climate change adaptation [15]. These aquatic plants receive great attention in nutrition research, due to their multiple uses in animal and human food. Azolla is a popular floating plant today. Various types of azolla are used as sustainable feed alternatives for livestock, poultry, and fish, whether in the form of dried or fresh flakes. In addition to its high content of protein and essential amino acids, azolla is rich in other nutrients such as vitamins and pigments [9]. It also contains almost all essential minerals like Fe, Ca, Mg, K, P, Mn as well as azolla. It is very rich in vitamins like (vitamin A, vitamin B-12, beta-carotene) is found mainly in tropical regions. [14]. As well, azolla rich with probiotic, carotenoid, along with biopolymers. Besides, it could be utilized as antibacterial and antioxidants agents owing to have high contents of phenols as well as flavonoids, as the breeder can replace about (20 - 25%) of commercial feed with azolla, and due to its

ease of cultivation, high productivity, and good nutritional value, it is used as a nutritional supplement by researchers [5]. In 1967, Skoltrup conducted an experiment and reported that azolla could be used as cow feed. Feeding broiler chickens with azolla has also been found to result in growth and body weight values similar to those resulting from the use of corn and soybean meal. [8]. The azolla plant is also used in the feed industry for many reasons, including its availability, cost-effectiveness, sustainability, and others. It is a good alternative to protein from expensive sources, such as fish oil and fishmeal, depending on the feeding behavior of fish species [12]. Additionally, it is known as green gold owing to their nutritional values in augmenting and enhancing milk productions as well as reinforcing animals health that ensure well production. Moreover, azolla could grow in various aquarium [4]. Feed is one of the most important factors on which the livestock sector is built, given Because of its importance in feeding animals to ensure their sustainability and functions. Various, such as growth, reproduction and production. And whether it is These feeds are concentrated or coarse, so they must be provided to meet the nutritional needs of the animals. [7]. We conclude from the above that green fodder is one of the most important determinants of the vertical and horizontal expansion of animal production in general, as it is considered a basic source of animal nutrition. It is also grown in all seasons of the year, and the demand for fodder is a demand derived from the demand for livestock, poultry and fish, as the increase in demand for these products leads to an increase in the demand for fodder of various types. Azolla breeding and production projects are considered one of the most important modern sources in unconventional agricultural production, which aim to spread and adopt modern and

sustainable farm practices as a recent insight for farming works and production and an alternative to the traditional raw materials used in the manufacture of feed, food supplements, fodder and expensive fertilizers, in a way that serves the protection and sustainability of natural resources and the preservation of the environment, including its biological diversity, as it is an integrated green biological system that depends on natural relationships between different species [1] Since the spread of these technologies will lead to a high level of production and productivity, the number of guidance and training activities carried out by guidance specialists is small, which affects effective ideas, sustainable refinement and effective actions to evolve farm's crop workers; Therefore, there is a demand to minimize gaps among knowledge of azula feed cultivation methods and their application. It is as well requisite to provide azula's workers with useful vital needs to confront climate change, environmental pollution, and the rise in fodder crop prices [4] In order to develop the knowledge of agricultural employees and enhance their skills, they must be trained and guidance programs built for them based on their real guidance needs, which will contribute to activating their professional experiences and updating and developing their knowledge, which will increase their credibility and make them more responsive and complete to their requirements and actual role [10] Therefore, there was a need to conduct this research to find out the extent of agricultural employees' knowledge of such technology (Azula), as they are the ones who transfer modern technologies to farmers. The success of expanding this application depends largely on the capabilities and knowledge of the Agricultural Extension and Codification

staff in the Agriculture Directorate who work to transfer the technology Production management and field training for farmers. Therefore, studying the cognitive needs of these employees is an essential step in designing effective interventions. This prompted the researcher to achieve the current investigation, which primarily aims to determine conjective needs of agricultural employees in Nineveh Governorate in the field of producing fodder azula used in feeding farm animals. In general, the research attempts to answer the following questions:-

1. What is the level of cognitive need of farmers in Nineveh Governorate in the field of producing fodder azula used in feeding farm animals?
2. To what extent are cognitive need of those employees related to their personal and job characteristics?

The current study objectives

1-Determining general level of cognitive need of employees in Nineveh Agriculture Directorate in the field of production fodders azula used in feeding farm animals.

2-Arrangement paragraphs on the cognitive needs of studied employees according to the importance of the paragraph.

3-Finding the association among knowledge need of employees under study and all independent variables below: **(scientific qualification, service duration, specialization in agricultural Extension, age, gender, sources of data related to knowledge needs of studied workers).**

Research materials and methods

This investigation involved all agricultural employees in Nineveh Agriculture Directorate, numbering (310) employees. A randomly sample inclusive of 30% of employees has been chosen, resulting in a sample size of 93 workers. Data have been gathered using a questionnaire, which it was also classified into two parts: Part One: The independent variables include the following: (scientific qualification, number of years of service, specialization in agricultural guidance, age, sex, sources of data linked to cognitive need of studied employees). First: The scientific qualification was measured by allocating numerical codes to the levels inclusive of: A) Preparatory Agriculture, B) Technical Diploma, C) Bachelor of Agriculture, D) Higher Diploma, E) Master, F) PhD.

Second: Duration of service; this variable has been assessed by mean of ask the studied employees about calculating years that those employee worked within Nineveh Agriculture Directorate. Third: Specialization in agricultural Extension, which is assessed by mean of ask studied workers A) specialist in agricultural guidance, B) and a no specialist in agricultural guidance.

Fourth: age, which has been assessed by recoding years of age of studied workers.

Fifth: gender, which had been done Measuring it using allocating digital codes for two levels: A) male, B) female.

Sixth: sources of information related to cognitive need of studied employees in fodders azula producing field where it has been measured via 9 exporters of data along with four substitutes have been placed in front of them, namely (always, often, sometime, don't understand). The

values have been allocated to the substitutes, respectively, are: 1, 2, 3, and 4). The overall result is representative that variable. The 2nd section of studied questionnaire involved paragraphs number to detect cognitive need of studied workers, which numbered(22) paragraphs. Five alternatives were placed in front of each paragraph, which are (very large need, large need, medium need, small need, very small need) The scores were determined for it (1, 2, 3, 4, 5) respectively, so that the total scores are representative of the cognitive need of agricultural workers. Apparent rationality of studied questionnaire has been confirmed by displaying it to specialists from Department of Agricultural Extension&Technology Transfer. Depending on their suggestions, some paragraphs were rewritten, while other were removed, and a preparatory assessment has been performed randomly sampling (survey sample) from (thirty) workers Agricultural and they were excluded from last specimen. Cronbach's alpha has been applied to assess questionnaire's stability from surveyed specimen, as overall stability coefficient is (0.85) [2]. Following finished this form and make sure its preparedness for collecting data, these data had gathered throughout duration time from (1/12/2025) to (1/2/2026). Subsequent to finish collection of these data, transcribing, along with tabulating, they were statistically tested employing arithmetic mean and Spearman's rank correlation coefficient [3], and the simple correlation coefficient (Pearson) [6].

Results and discussions

First: Determining the level of cognitive need of studied employees at the targeted area of Nineveh Agriculture Directorate in production fodders azula field used in feeding farm animals in general.

Cognitive needs of those workers have been categorized into (3) groups employing theoretical range method, the score of which ranging from 22 - 110. Thus, these groups have been detected as exhibited in (Table 1).

Table (1): Classifying of answers based on the cognitive need for agricultural employees

Average	percentage	frequency	categories
85.67	9.68	9	Little need (57-38)
64.42	50.54	47	Medium need (77-58)
52.13	39.78	37	Great need (more than 78)
-----	%100	93	

Table (1) indicates that (9.68%) of the respondents have little knowledge need . The highest percentage (50.54%) of respondents is in the middle category .This is followed by a percentage of (39.78%) of the respondents whose knowledge need is great .This means that agricultural employees are in great need of increasing their knowledge in the field of azula plants

This may be due to the novelty of this topic compared to traditional agricultural topics. Also, the multiple uses of azula in animal nutrition, improving soil fertility, and sustainable agricultural production may require specialized knowledge (Any specialized employees) and may not be sufficiently available among all employees.

Second: Arranging the paragraphs on cognitive need of studied employees according to the importance of the paragraph.

Table (2): Arrangement of the items on the cognitive need of studied employees based on arithmetic average

Ranks	Average	Paragraphs	No.
9	3.8817	Know the botanical description of Azula	1
6	4.0107	Knowing the biological nature of the azula plant	2
3	4.0967	Knowing the importance of azula in sustainable agriculture	3
4	4.0752	Understanding the relationship of azula to nitrogen-fixing bacteria through its symbiosis with cyanobacteria	4
11	3.8064	Knowing the nutritional value of azula for animals and poultry	5
18	3.5483	Knowing the role of azula in improving soil fertility by using it as a green fertilizer.	6
21	3.4408	Know how to create azula basins	7

19	3.4946	Identify the appropriate environmental conditions for azula growth	8
8	3.9139	Knowing how to incorporate azula into integrative agriculture (fish/plant)	9
20	3.4838	Inference about the methods of azula reproduction	10
22	3.3118	Knowing how to maintain azula plant beds	11
5	4.0322	Knowing how to harvest azula	12
2	4.1397	Knowing how to manage water for the azula plant	13
7	3.9462	Knowing the appropriate conditions for the growth of the azula plant	14
10	3.8172	Know how to store azula plants	15
15	3.6021	Knowing the benefits of azula as a high protein source for feed	16
14	3.6129	Knowing the uses of azula as an alternative to traditional feed for poultry, livestock and fish	17
16	3.5806	Knowing the nutritional needs of azula	18
13	3.6989	Knowing the methods of producing azula plants at home	19
12	3.7634	Knowing the importance of the azula plant in reducing the need for expensive commercial feed	20
17	3.5698	Knowledge of supporting azula plants with other aquatic forage plants	21
1	4.3225	Knowing the designing of suitable ponds for the azula plant	22

The worker assessment items exhibited in Table (2) were ranked based on their arithmetic mean. The item ranked first is the item of (Knowledge of designing suitable ponds for the azula plant) with an arithmetic average of (4.3225). This indicates that agricultural employees do

not have sufficient knowledge about this paragraph. While the paragraph (Knowing how to maintain azula plant beds) ranked last with an arithmetic average of (3.3118), the reason for this may be because agricultural employees have sufficient information about this paragraph.

Third: Finding association relationship among cognitive need of studied workers in Nineveh Agriculture Directorate in producing fodders azula field used in feeding farm animals and all of studied independent variables that including:

- 1- **scientific qualification:** The rank of Spearman's correlation analysis has been applied to determine the association of scientific qualification with cognitive need of studied workers, which amounted to (0.036-), indicating a non-significant association between them
- 2- **Duration service:** Simple Pearson correlation analysis has been applied to determine if years of agricultural job service being correlated with

cognitive need of studied workers, where it was found a positive significant correlation between them ($r=0.801^{**}$, p value=0.01), indicating that cognitive need of those workers is increasing by rising number of years of agricultural job service.

- 3- **The specialization of agricultural Extension:** The rank of Spearman's correlation analysis has been applied to determine the association among specialization and cognitive need of

studied workers, where non-significant correlation was present (0.033), indicating no significant association among the specialization and cognitive need of studied workers.

- 4- **Ages:** Simple Pearson correlation analysis has been applied to determine if ages of studied workers are correlated with cognitive needs of them, where it was found a positive significant correlation between them ($r=0.844^{**}$, p value=0.01). This significant association can be attributed to that older employees' awareness of the importance of keeping pace with scientific developments increases their feeling of the need to update their knowledge

in this field (azola plant).

- 5- **Gender:** The association between gender and cognitive need of agricultural workers was assessed by the rank Spearman correlation, which reached to (-0.29), indicating no significant association between them.
- 6- **Source of data linked with cognitive need of studied employees:** The relationship
- 7- between these sources and cognitive need of agricultural workers was assessed by simple Pearson correlation analysis, where it accounts (0.005-), indicating non-significant association between them

Table (3): Exhibits the outcomes of correlation analysis between cognitive need of studied workers and the certain studied variables

Rs Values	R Values	Percentage%	No.	Variable
0.036-	-----	1.07% 5.37% 48.38% 5.37% 32.25% 7.53%	1 5 45 5 30 7	scientific qualification Preparatory school Institute Bachelor's degree Higher Diploma Master's PhD
-----	0.801**	59%.65 26.89% 7.52%	61 25 7	Number of years of service (12-1) years (24-13)years (25-more than) years
0.033	-----	15.10% 84.90%	14 79	specialization in agricultural Extension specialist non-specialist
-----	0.844**	45.16% 40.86% 13.89%	42 38 13	Age (28-38 years) young (39-49 years) Intermediate (50-60 years) Big
0.029-	-----	54.83% 45.18%	51 42	Gender male female
-----	0.005-	17.20% 43.02%	16 40	sources of information (14-17) (18-21)

		39.78%	35	(22-26)
		100	93	Total

** At level (0.01)

Conclusion

1. We conclude that agricultural employees need more knowledge in the field of azula plants, which requires attention to providing them with information and knowledge related to their cultivation and sustainability.
2. It is necessary to focus on the most important paragraphs by including them in training courses, as they received the highest level of interest in the paragraph (knowledge of designing suitable ponds for the azula plant) compared to the other paragraphs.
3. The paragraph that ranked last reflects less important aspects compared to the rest of the paragraphs, and this indicates a low level of need for this paragraph because the respondents possess a sufficient amount of knowledge related to it.
4. We conclude that the variable (age and duration service) being more related to cognitive needs than other characteristics (scientific qualification, specialization in agricultural Extension, gender, origin of data linked with cognitive need of studied workers).

Recommendations

1. Prepares training programs for those employees by collaboration with College of Agriculture&Forestry along with coordinating with Directorate of Agriculture in Nineveh, all the related departments, as well as agricultural extension and train offices
2. Focuses the guidance actions and training courses on farm workers and raising their awareness of the importance of the azula plant.
3. Establish partnerships between research institutions and the private sector to support widespread adoption of azula, which enhances agricultural sustainability and reduces dependence on imported feed.

Resources

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