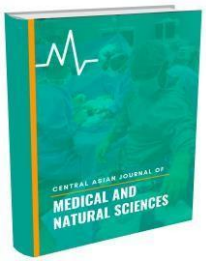

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*Article*

# Knowledge and Developmental Needs of Vegetable Farmers in Rabia Region/ Nineveh Governorate of the Seedling Production on Certain Vegetable Crops

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**Abstract:** The study was aimed at determining the knowledge needs of vegetable farmers in Rabia area of Nineveh Governorate, Iraq about seedling production of selected vegetable crops. To achieve this, a proportional random sample was taken with 10% of the selected villages with a sample size of 100 farmers. A two-part questionnaire was created to gather data. The first one involved measuring the independent variables whereas the second one included a four-item scale with 27 items to measure the knowledge requirement of vegetable farmers in Rabia area about preparation of seedlings of specific vegetable crops. The face validity and content validity of the questionnaire were checked and the reliability coefficient was obtained through Cronbach's alpha and was 0.86, which is an acceptable reliability coefficient. The data was analysed using SPSS statistical software and other statistical tools like frequencies, Pearson's correlation coefficient and Spearman's rank correlation coefficient. The results revealed that the knowledge needs were moderately high and high in the area of vegetable seedling preparation for about 88% of the respondents, while there was also significant correlation between knowledge needs and the following variables (Gender, Educational level, Number of years in work in vegetable seedling preparation and sources of agricultural information). The study also included a number of conclusions and recommendations.

**Keywords:** Knowledge needs, vegetable farmers, Rabia area , Nineveh Governorate, Iraq

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## 1. Introduction

The process of development is a major concern in the thinking of the current generation of economists, whether they are from developed or developing countries; however, this importance is more evident in developing countries, Furthermore, the greatest challenge facing development in these countries is the prolonged stagnation they have experienced, from which it has become difficult to emerge given the current economic conditions in these nations. Furthermore, man plays a very great role during the development process [1]. Agriculture has a unique position in the economies of many developed and developing countries and countries of the world are trying their best to develop and expand this sector to provide food for their people and raw materials for many industries [2]. The availability of sufficient food for the world's population of 9.4 billion by 2050 [3] has become a necessity, because the agricultural sector is one of the most vital productive sectors in the economy of most countries, including the Arab countries. In

Arab countries, agriculture has a pivotal role in improving the living and social standards of the population, and is a primary source of national income as well as employment for the majority of the population [4] . The agricultural sector contributes significantly to the development of the Iraqi national economy by providing food and employment opportunities for the population; 45% of the rural population depends on it for their livelihood, and 20% of the workforce is employed in it, and agricultural products—including vegetable crops—are considered one of the most important pillars and foundations of that economy [5,6]. Besides their excellent nutritional value (high protein, fat, vitamins, minerals, fiber, etc.), vegetable crops are also important because they are a significant source of food and for food security. The increasing population has resulted in an increasing daily demand for vegetables, which has created an immediate need for a thorough development and expansion of vegetable production to ensure high levels of output, productivity and quality of the vegetables produced. This has necessitated the use of hybrids and improved varieties, the development of production technology and systems and a reliance on cultivated hybrid seeds of vegetables, which are imported from abroad and are mostly high-yielding hybrids in the nursery sector, which is one of the most important economic factors in the global vegetable farming system [7] . Obviously the cost of importing these varieties is extremely high and hence care is needed in nursery cultivation of seed and also in the production of seedling varieties to produce very strong seedling free from diseases and morphological defects, which in turn will improve the efficiency of seedling production [8]. Effective agricultural extension services is about communicating with farmers to encourage them to accept and adopt agricultural practices and innovations which are suitable to solve their problems in agricultural production, this will help in increasing farmers' agricultural production and productivity, thereby contributing to better farmers' income and living standards [9] . In response to the above, and to boost the role of agricultural extension in enhancing farmers' knowledge and skills in vegetable seedling production in the Rabia region, where most farmers depend on small field nurseries where they lack many aspects of scientific knowledge essential for the production of vegetable seedlings, such as hybrid varieties with high yields and resistance to diseases and insects, and matters related to planting dates, soil preparation, and selecting suitable plastic covers for the field nursery, among others. Since there are no studies that measure the knowledge needs of the vegetable farmers on the production of seedlings, the researchers chose to do this study, whose objectives we can sum up as follows [10]:

1. To determine what vegetable farmers in Rabia area of Nineveh Governorate knew and didn't know about raising seedlings for certain vegetable crops in particular.
2. To know what information vegetable farmers in Rabia area, Nineveh Governorate need to prepare seedlings for some vegetable crops at each of the sections of the study.
3. To find out the personal (communication, social and economic) characteristics of the respondents.
4. To assess the correlation between the knowledge requirement of the vegetable farmers of Rabia area on preparing seedlings of some vegetable crops and the factors included in the study (age, gender, educational level, years of experience in seedling preparation, type of land tenure, and source information).

### 1.1. Significance of the Research

This research is important because vegetable crops are very important to human beings because they contain high nutrients, vitamins and other elements which are essential to the human diet, apart from the economic importance of vegetable crops to farmers as majority of vegetable crops bring quick economic returns to farmers. Hence, this study aims at finding out the need of the farmers in the knowledge of seedling preparations as this is a very important aspect to identify the gaps in the farmers

knowledge and to provide the necessary knowledge to them, so they can produce healthy, early maturing seedlings with high yield and pest and disease resistance.

### 1.2. Research Hypotheses:

The number of the research variables determines the number of statistical hypotheses to be tested in this regard, and four statistical hypotheses were tested, as follows:-

1. There is no significant correlation between knowledge needs and age.
2. No significant correlation between knowledge need and education level.4- No significant correlation between knowledge need and gender education.
3. There is no statistically significant relationship between knowledge needs and education level.
4. There is no significant statistical relationship between number of years in seedling preparation and knowledge needs.
5. The type of farm tenure is not statistically significantly correlated with knowledge needs.
6. The results showed that 6- no statistically significant relationship existed between knowledge needs and sources of agricultural information.

### 1.3. Operational Definitions

**Knowledge Need**: It is the need of the farmers with regard to knowledge regarding the vegetable seedling production level of knowledge deficiency; it is the amount of deficiency in the level of knowledge in vegetable seedling production field.

**Vegetable seedlings**: This is the first step in vegetable production where seeds of large number of vegetable crops are planted early in special nursery beds to avoid the effects of weather and to reduce the length of time needed for the seed to grow before planting in the field.

### 1.4. Objective Definitions:

**p value**: This is the lowest p value for which the null hypothesis is rejected. A value less than 0.05 would reject the null hypothesis and a value greater than 0.05 would accept the null hypothesis. When using the SPSS statistical software, it is displayed automatically.

1.5. **Pervious Research**: No previous research has been conducted in this area.

## 2. Materials and Methods

The study included all farmers in Rabia sub-district in the northwestern area of Nineveh Governorate, which is (1200 farmers) and from the selected villages, 10% of farmers (120 farmers) was selected. Twenty questionnaires were discarded due to being incomplete or due to not being returned [11-14]. The data obtained from the research were prepared by making a questionnaire made from two parts. The first part comprised the independent variables that were the basis of the study, which were age (up to the time the data was collected: the numbers assigned to the age categories were 1, 2, 3, 4, 5 and 6 for under 18, 18 to 21, 22 to 24, 25 to 28, 29 to 32, and above 32, respectively), gender (1: male and 2: female), and the level of education of the farmer (literate: 1, elementary school graduate: 2, middle school graduate: 3, preparatory school graduate: 4, technical institute graduate: 5, college graduate: 6). The variable “number of years working in seedling preparation” was measured by the number of years the farmer had worked in seedling preparation up to the time of data collection. This variable “type of farm tenure” was recorded as “owned” (1), “contracted” (2), “leased” (3), or “shared” (4). Finally, the sources

of agricultural information was measured based on 10 information sources for each of which three response alternatives were used: always, sometimes, and never. The values of 3, 2 and 1 given to the options, respectively. Therefore, the (theoretical) range of this variable is between 10 and 30 points and it has been categorized into three groups. The questionnaire consisted of 27 items related to the knowledge needs in the area of vegetable seedling preparation, the second part of the questionnaire. Response options were given for each item: "High Need," "Moderate Need," "Low Need," and "No Need," with numerical values of 1, 2, 3, and 4, respectively, to assess the knowledge needs. The numerical coding for all items measuring respondents' knowledge needs were added up to determine the total knowledge need of each respondent. The questionnaire was face validated with seven agricultural extension professors to ensure the validity of the questionnaire, and the wording of some scale items was changed in accordance with their comments. The scale was also shown to a panel of expert professors in the horticulture and landscape architecture fields to be sure the wording of the items is scientifically accurate. To test the reliability of the questionnaire, 30 farmers from outside the original research sample were selected. The reliability coefficient was calculated using Cronbach's alpha, which was 0.86, and is considered a high reliability [10].

Once the questionnaire had been completed, data was gathered in September to November. The data were then fed, classified and analyzed by the following statistics; frequencies, percentages, Pearson correlation coefficient, Spearman rank correlation coefficient and SPSS statistical software.

## 3. Results and Discussion

**The first stage**: (Identifying the Knowledge needs of vegetable farmers in the Rabia area of Nineveh Governorate in the preparation of seedlings for certain vegetable crops) showed that the theoretical range of the knowledge needs scale was 61 – 106 points, which was divided into three categories for each vegetable crop: low, moderate and high knowledge needs, as illustrated in Table 2.

Table (2) Level of Knowledge Needs Among Vegetable Farmers in the Rabia Region Regarding the Preparation of Seedlings for Certain Vegetable Crops in General

| Category | Replication | Mean | Percentage % |
|---|---|---|---|
| **Low (61-75)** | 12 | 66 | 12% |
| **Midium (76-90)** | 48 | 85 | 48% |
| **High (91- 106)** | 40 | 94 | 40% |
| **Total** | 100 | | |
| 85,4= $\bar{X}$ | 7,25= S.d | | |

Table (2) reveals that 88 % of the respondents consider their knowledge level related to seedling preparation of some vegetable crops to be moderate to high, therefore, farmers' knowledge level is low compared to their need, and this may be attributed to lack of training given to the farmers for vegetable seedling production, and also the outdated methods that the farmers use for vegetable seedling production.

**The Second Stage**: Identifying the knowledge needs of vegetable farmers in Rabia area, Nineveh Governorate for preparation of seedlings for some types of vegetables in each section of the study:

Table (3) Ranking of knowledge needs by necessity and importance.

| | Items | Mean | Order |
|---|---|---|---|
| **9** | Be able to choose varieties to grow in a nursery. | 3.38 | 1 |
| **22** | Understand the significance of pre-sowing chilling and how to use it to break seed dormancy. | 3.34 | 2 |

| | | | |
|---|---|---|---|
| **10** | Understand precautions and procedures for seed fumigation before planting. | 3.29 | 3 |
| **12** | Be able to choose the right growing media for seedlings. | 3.27 | 4 |
| **25** | Know the requirements for sand to be used as a growing medium | 3.27 | 5 |
| **7** | Know how to use TP filter paper as a growing medium | 3.30 | 6 |
| **11** | Understand the required quantity of water for irrigation of seedlings. | 3.25 | 7 |
| **20** | Understand the amount of ventilation needed for seedlings | 3.25 | 8 |
| **23** | Understand the light that seedlings need.Understand the light needs of seedlings. | 3.25 | 9 |
| **24** | Be familiar with the seed rate that was used in the growing media | 3.25 | 10 |
| **19** | Understand and apply pre-sowing drying to break seed dormancy | 3.22 | 11 |
| **4** | Understand the process of breaking seed dormancy with the use of light. | 3.19 | 12 |
| **21** | Be able to use potassium nitrate to break seed dormancy | 3.18 | 13 |
| **1** | Be able to use gibberellic acid to break seed dormancy | 3.17 | 14 |
| **14** | Know how to use the soaking method to remove seed coat hardness | 3.17 | 15 |
| **27** | Be familiar with mechanical seed coat hardness removal technique | 3.17 | 16 |
| **2** | Know how to soften the testa of seeds using acids. | 3.16 | 17 |
| **13** | Be aware of ways to eliminate seed inhibitors. | 3.11 | 18 |
| **26** | Understand methods for disinfecting seeds before planting | 3.11 | 19 |
| **15** | Know the reasons for abnormal seedlings | 3.10 | 20 |
| **18** | Be able to explain the application of the greenhouses for seedling production. | 3.10 | 21 |
| **16** | Understand the benefits of using greenhouse nurseries in agriculture | 3.09 | 22 |
| **17** | Get to know planting trays for seedling growing. | 3.08 | 23 |
| **3** | Discuss suitable techniques for the care of seedlings. | 2.97 | 24 |
| **6** | Learn the appropriate time to transplant seedlings to the field | 2.90 | 25 |
| **5** | Know the correct ways to plant out seedlings to a field. | 2.84 | 26 |
| **8** | Learn appropriate methods for preparing the field for planting seedlings | 2.83 | 27 |

Table (3) shows that the sections ("Knowledge of selecting seed varieties suitable for planting in a nursery," "Knowledge of how to use pre-sowing cold treatment to break seed dormancy," knowledge of seed fumigation methods prior to planting) ranked in the top three in terms of farmers' knowledge needs. This finding shows the relevance of these items, as they were the most important for farmers in terms of knowledge needs in vegetable seedling preparation. However, the items (knowing the appropriate time to transplant seedlings into the field, knowing the appropriate methods for transplanting seedlings into the field, and knowing the appropriate methods for preparing the field for planting seedlings) ranked last, respectively. This result indicates that these items are of lesser importance in determining farmers' knowledge needs [15].

**Third Stage**: to determine the association of vegetable farmers knowledge about how to prepare seedlings for some vegetable crops in Rabia region with the variables of the study (age, gender, level of education, years of experience in preparing seedlings, land tenure, and sources of information).

1) **The Age**: the respondents were segmented in three sections as indicated in Table (4) according to their ages.The respondents were divided into three age groups as depicted in Table (4).

Table (4) Distribution of Respondents by Age

| Category | Number | % | R Mean | Pearson's simple correlation coefficient | P Value | ∞ |
|---|---|---|---|---|---|---|
| **Low (18-29)** | 47 | 47 | 23 | | | |
| **Midium (31-43)** | 32 | 32 | 38 | | | |
| **High (44-57)** | 21 | 21 | 52 | 0.004 | 0.965 | NS |
| **Total** | **100** | **100%** | | | | |

From the table (4) it is revealed that the highest percentage of the respondents were aged between 18 and 29 years which comprised (47) respondents, followed by middle age group which comprised (32) respondents and upper age group which comprised (21) respondents. The Pearson correlation coefficient was used to obtain the correlation between cognitive needs and age, which resulted in an index of 0.004. A p value of 0.965 (which is greater than the 0.05 significance level) was used to test the significance of the relationship. This means that the relationship between cognitive needs and the age variable is not statistically significant and so the null hypothesis is accepted: the relationship is not significant. This might be because most of the participants whether old or young have cognitive needs related to the preparation of seedlings.

2) **Gender**: the respondents were divided into male and female as shown in Table (5) on the basis of gender.

Table (5) means that it is being distributed.

| Category | Number | % | Pearson's simple correlation coefficient | P. Value | ∞ |
|---|---|---|---|---|---|
| **Male** | 81 | 81 | | | |
| **Female** | 19 | 19 | 0.426 | 0.006 | 0.01 |
| **Total** | 100 | 100% | | | |

Table (5) indicates that the majority of the respondents were male 81 persons, while 19 persons were females. Pearson's correlation coefficient was employed to establish the correlation among farmers knowledge needs and gender, the level was not significant and its value was 0.426. To test the significance of the relationship, a p-value of 0.006 was used, which is less than 0.05. The relationship between the Cognitive needs variable and the Gender variable is statistically significant: (Thus the null hypothesis is rejected and the alternative hypothesis is accepted i.e., there is a statistically significant correlation between the cognitive needs and the gender variable). This was observed as most of the respondents were males, and males engage in most of the agricultural activities in nursery, this could be due to the significant correlation between gender on cognitive needs.

3) **Educational Level of Vegetable Farmers**: The respondents were classified according to their educational level as illustrated in Table (6).

Table (6) Distribution of the respondents according to their level of education.

| Category | Number | % | Seperman simple correlation coefficient (r) | P. Value | ∞ |
|---|---|---|---|---|---|
| **Read and Write** | 19 | 19 | | | |
| **Elementary School** | 15 | 15 | | | |
| **Intermidiate School** | 21 | 21 | | | |
| **High School** | 22 | 22 | 0.244 | 0.013 | 0.05 |
| **Diploma** | 10 | 10 | | | |
| **Bachelor's Degree** | 11 | 11 | | | |
| **Postgraduate** | 2 | 2 | | | |
| **Total** | **100** | **100%** | | | |

As seen from the table above, the highest knowledge needs were in the preparatory school, which is (21,22%) followed by the middle school with (11,12%). This could reflect the fact that farmers in these two groups have either primary farm-based occupations or low employment opportunities, and are more likely to accurately identify their knowledge needs as their primary occupation is farming, particularly for those with a middle school diploma. The Pearson correlation coefficient (0.244) was used for determining the relationship between knowledge needs and educational level. In order to test the significance of the relationship, the p-value was used, which was less than (0.05) This shows that the relationship between cognitive needs and educational level is statistically significant, so the null hypothesis is rejected and the alternative hypothesis is accepted: (there is a statistically significant correlation between educational level and cognitive needs). This could be because those with higher education are more accepting of information and can determine their cognitive need [16].

4) **Number of Years in Participating in the Nursery Program:** The highest year a respondent reported working in the vegetable seedling preparation was 31, the lowest was 1 year and the average was 11 years. The respondents were categorized according to this variable, which is shown in Table (7).

Table (7) Distribution of Respondents According to Years of Experience in Seedling Production

| Category | Number | % | Pearson's simple correlation coefficient | P Value | ∞ |
|---|---|---|---|---|---|
| **Low (1-10)** | 57 | 47 | | | |
| **Midium (11-20)** | 37 | 32 | | | |
| **High (21-30)** | 6 | 21 | 0.411 | 0.047 | 0.05 |
| **Total** | **100** | **100%** | | | |
| 11.34= $\bar{X}$ | 7,25= S.d | | | | |

As presented in table (7), the highest percentage (37.57)%, respectively, is found in the low and medium years of work categories. This is due to the fact that most of the respondents were of the young or of middle age and hence the results indicated that most of the respondents were categorised into the first and second category of this variable. The Pearson correlation coefficient value of (0.411) was used to investigate the relationship between knowledge needs and number of years in seedling preparation. To test the significance of the relationship we used a P value of (0.047) which is less than (0.05) means that, the relationship between the cognitive needs variable and number of years of experience in vegetable seedling preparation is statistically significant, hence the null hypothesis was rejected and alternative hypothesis accepted that is (there is a statistically significant correlation between cognitive needs and number of years of experience in vegetable seedling preparation). This could be attributed to the level of experience in producing vegetable seedlings over the years, hence the higher the level of experience, the better the respondents were able to identify their cognitive needs.

5) **The respondents were categorized based on the type of farm tenure**: as indicated in Table (8) into four groups: As shown in the table, tenants made up the largest group of respondents (48%) while landowners made up 30%.

Table (8) shows the distribution of respondents by type of farm tenure

| Category | Number | % | Seperman simple correlation coefficient (r) | P. Value | ∞ |
|---|---|---|---|---|---|
| **Ownership** | 30 | 30 | | | |
| **Contracts** | 18 | 18 | | | |
| **Rent** | 48 | 48 | 0.244 | 0.813 | 0.05 |
| **Joint Ownership** | 4 | 4 | | | |
| **Total** | **100** | **100%** | | | |
| 3.34= $\bar{X}$ | 2.30 = S.d | | | | |

Spearman's rank correlation coefficient was used to find the correlation between cognitive needs and farm tenure variable with a value of (0.054). The p value obtained was (0.813) which is greater than (0.05) this means the relationship between cognitive needs and the farm tenure variable is not statistically significant so the null hypothesis is accepted, meaning the relationship is not significant. This may be because few of the majority of the respondents have a markedly different cognitive need with respect to their involvement in vegetable seedling preparation, regardless of the type of farmland tenure they hold since they view preparing vegetable seedlings as an independent livelihood source whether or not they are the owners or renters of the farm land.

6) **Sources of Information**: The results indicated that the major sources of information were social media, radio and television. The respondents were divided by seven sources of information as given in Table (6).

Table (6) Distribution of Respondents According to Sources of Information

| Category | Number | % | Mean | Seperman simple correlation coefficient (r) | P. Value | ∞ |
|---|---|---|---|---|---|---|
| **Department of Agriculture** | 8 | 8 | 7.9 | | | |
| **Agricultural Extension Agent** | 10 | 10 | 9 | | | |
| **Radio and TV Programs** | 22 | 22 | 19 | | | |
| **Social Media** | 25 | 25 | 21.5 | | | |
| **Friends** | 12 | 12 | 11.8 | 0.245 | 0.067 | 0.05 |
| **Extension Bulletins** | 12 | 12 | 7.8 | | | |
| **Agricultural Newspapers and Magazines** | 11 | 11 | 9.5 | | | |
| | **100** | **100 %** | | | | |

As can be seen in Table (6), the greatest percentage of exposure to information sources was to social media at 25%, and to radio and television programs at 22%. The relationship between cognitive need and information sources were analysed using Pearson correlation coefficient (r = 0.245). The significance of the relationship was tested by using p value which is (0.067)—< (0.05). This means that the null hypothesis is rejected, and the alternative hypothesis is accepted, that is, (there is a statistically significant correlation between cognitive needs and the information sources variable). The respondents may be more exposed to the social media, television channels and radio programmes because they are easily accessible and information provided is timely.

## 4. Conclusion

The findings revealed that 88% of the respondents had moderate to high knowledge need with regards to vegetable seedling preparation indicating low level of knowledge among the respondents on vegetable seedling preparation. The results showed that there was a significant correlation between the variables (gender, educational level, years of work experience in seedling preparation and sources of information) and the knowledge needs. Based on the above, we conclude that these variables play significant roles in the respondents' knowledge needs. The analysis revealed that there was no significant relationship between variable age and variable type of land tenure. It is concluded that these variables are less important when studying the knowledge need of the respondents in terms of vegetable seedling production. Furthermore, the results indicated that a number of items of knowledge were highest ranked, including variety selection and breaking seed dormancy. We conclude that these items are of great importance for the

respondents for this reason they should be emphasised to give them knowledge that is related with the above items. Finally, variables which could affect the knowledge needs of the respondents are concluded; cultural openness and working in vegetable seedling production.

For this reason, our recommendation are greater use of social media and television programmes to transfer knowledge, as there was a high level of correlation between the use of these media and farmers' knowledge needs. We also recommend that the Extension Center conduct training courses for farmers of Rabia region in order to provide them with various skills in vegetable seedling production. Highlighting the role of agricultural extension in disseminating and transferring modern agriculture technologies, especially in the preparation of vegetable seedlings. It is also recommended to sensitize farmers on the importance of adopting hydroponics in seedling preparation because it cuts down a lot of work that is required to take care of the seedlings.

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