



## THE REASONS RELATED TO THE STOP OF FARMERS TO ADOPT THE TECHNIQUE OF PLASTIC HOUSES IN DIWANIYAH PROVINCE OF IRAQ

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### Abstract

The study aimed to identify the reasons why farmers stopped adopting the technique of plastic houses in Diwaniyah province. The data were collected from a random sample from 65 farmers who stopped adopting the plastic houses technique, by means of a questionnaire according to a quintile significance rating, their higher value amounted of 4 and zero degrees for lower value. Twenty-five reasons were identified in eight areas and two main axes: The reasons related to farmers and their agricultural systems and the reasons related to the institutional factor. The results of the study showed that the averages degrees of significance reasons are ranged between (2.61 - 3.92) with an average of total importance amounted of 3.39 degrees. Most of the reasons fall within the significance level from important to very important, including the competition of imported products and low their prices, weak protection of the local product, the infection of the Plant with pests, lack of economic capacity to purchase good quality from the requirements of production, lack of storages suitable for storage of crops, especially at Rush time. The researchers recommend the importance of the Ministry of Agriculture to develop the performance and effectiveness of the dissemination system of agricultural technique in general, the dissemination of plastic houses technique in particular as a prerequisite for achieving food security and improve the incomes of farmers and to benefit from the results of this study in the adoption of development decisions or decisions re-work on the deployment of this technique.

**Key words:** vegetables, plastic houses, technique, adoption, farmers.

### Introduction

Food and Agriculture Organization (FAO) of the United Nations has identified food security as one of the greatest challenges faced by agriculture in the world (FAO, 2015), which is a major challenge in Iraqi agriculture where Iraq is required to achieve significant increases in the two areas of plant and animal to meet the large and growing needs of agricultural products and food caused by the large and continuing increases in the population. Estimates indicate that the population of Iraq may reach 50.5 million in 2025, It is estimated that it needs from some basic agricultural products, such as wheat about 8 million tons and 1.7 million tons of rice, 5.9 million tons of vegetables (Al-Hakim, 2013). There are several strategies and inputs to increase production, including vertical expansion, which is an effective strategy for increasing productivity and agricultural production, and the global trend confirms this model through the use of modern technologies that contribute to the conservation of natural resources (FAO, 2011). Thus, the agricultural sector in the world has witnessed a rapid and significant increase in the dissemination of agricultural technologies that aims to increasing agricultural production. Vegetables are considered one of the main axes of agricultural production and food and contribute significantly to achieving sustainable food security and the national economy. They are an important source of national

economy in a number of countries by exporting large quantities of agricultural products to other countries and providing hard currency which contributes to the development of National economy For example, in Australia, vegetables provide an economic return of \$ 3.7 billion per year (Clar *et al.*, 2018). As well as their contribution to the development of Gross National Product and to the development of the contribution of the agricultural sector to Gross domestic product GDP. Vegetables are a daily food for the population and a source of many food industries, this activity is very large for farmers and their families and it is the main source of their income. Vegetables cover about 1.1% of the world's total agriculture and their production has increased with ratio of 60% over the last 20 years (FAO, 2010). Global production of vegetables is 1.13 billion tons from about 58 million hectares. In the last decade, global production has increased from it at an average annual rate of about 3% (Paolo *et al.*, 2017). Among the advantages of vegetables is the possibility of rapid and sustainable increases. Vegetable crops are ranked second order in plant production after (wheat, barley and rice). These rapid increases can be achieved by using selected varieties and modern technologies that can be applied to small areas among these technologies (plastic houses) (Iraqi Ministry of Planning, 2013). Agriculture in plastic houses is considered an important development in increasing the productivity and production of many agricultural products, especially

vegetables; where the productivity of vegetables can be more than double, and may be up to five times compared to open cultivation (Jaber and Hussein, 2014). The average productivity of the tomato crop under the protected agriculture method amounted of (8.5 tons / dunam) compared to its productivity under open cultivation method which amounted of (3 tons / dunam) in the same area (Al-Bahadli, 2014). As well as their importance in rationalizing the use of natural resources, production in their non-seasons and improving farmers' incomes. Agriculture in plastic houses has emerged as a means of protecting crops from adverse climatic conditions and year-round production, applying integrated crop production and protection management approaches to improving pest and disease control. The production of plastic house crops has become a growing reality worldwide (FAO, 2017). Therefore, this technique has rapidly spread in the world, That more than 50 countries are using cultivation in plastic houses and the covered area by about 16 million hectares (Jaber and Hussein 2014). Some countries have exceeded 90,000 hectares, such as Netherlands (NABARD, 2015). At the level of the Arab world, the area covered with protected agriculture in 2015 amounted of 293000 hectares, in Saudi Arabia, the covered area with protected agriculture amounted of 111000 hectares (Arab Organization for Agricultural Development, 2016). In order to achieve the positive advantages of using this technique, it is very important for the farmers to continue using it in agriculture, which is known as the integration of this technique into the farming system or expressed in the adoption of the adoption decision, which constitutes the final stage of adoption of agricultural technologies (Rogers, 2003), where the farmer's adoption of agricultural technologies is influenced by several factors, including: scarcity of inputs, lack of loans, age, gender, education, farm size, agricultural experience and membership in agricultural associations (Onumada *et al.*, 2014; Ayse *et al.*, 2011) mentioned that there are seven factors influencing the adoption of modern techniques are: age, education, income, Operational objective for the farm, participation in extension activities, utilization of media and Benefit from agricultural incentives. Orisakwe *et al.* (2011) indicated a range of factors influencing the adoption of technologies: Age, Education Level, Farm Size, Income Sources, Loans and Agricultural Extension. Audrey, (2014) stated that loans, training, agricultural extension services, markets, age, Gender and education are factors influencing the adoption of modern agricultural techniques. Obayelu, (2017) identified ten specific factors in the adoption of techniques are: technique characteristics, economic factors, physical factors, human factors, access to information, loans, farmer characteristics, transport costs and cultural differences.

Tidd, (2010) identified three groups of factors that influence the adoption of innovations: Group of technique-related factors, the group of factors related to the target populations, the institutional and environmental factors group. Al-Taei (2013) mentioned that the speed and scope of the spread of agricultural technique is affected by several interrelated factors, foremost among which are the characteristics of the technique and farmers and their agricultural systems, the dissemination plan and the based organizing by the dissemination process, the level of effectiveness of extension, the provision of technique, the supplying the farmers by it, services, follow-up, evaluation, the characteristics of both government support and lending. Based on the importance and advantages of this technique (cultivation in plastic houses), the country's need to develop the productivity of vegetables and the sustainability of increasing their production as one of the basic components in achieving sustainable food security for the community members, the Ministry of Agriculture and through a number of its formations in the dissemination process of this technique in the second half of the first decade of the current century in a number of provinces, including Diwaniyah province, one of the Middle Euphrates provinces in the country where the vegetables cultivation is widespread in it, works in their activity field a thousands of farmers and their families, constitute the basis source for their income, which witnessed the launch of the process of technique dissemination in 2007 with 19 plastic houses, then there was an annual increase in the number of people applying for technique, increasing number of plastic houses and increasing the number of areas applied in it. Their number amounted of (813 plastic house) in 2013, the number of applying farmers amounted of (365 farmers) distributing on most of the agricultural sectors in the province. In 2014 and subsequent years witnessed the spread of this technique in the province of Diwaniyah two problems synchronized: the first is stopping disseminations processes and the second is a significant and continuous decline in the number of farmers that continue to applying it as a result of many of them have stopped applying it. In 2016, the number of plastic houses dropped to 417 homes and the number of farmers employed in it are (199 farmers) (Diwaniyah Agriculture Directorate, 2017). The decline in the adoption of agriculture technique in plastic houses in Diwaniyah province is not consistent with what should be the cultivation of vegetables in the province and does not conform with the requirements of achieving food security in the country as well as it is considered a weakness in the effectiveness of the dissemination process of technique, and raises several questions, including: What are the reasons for the non-continuity

of the peasants by adopting plastic houses in the province?

The study aims to determining the reasons why farmers stopped adopting the technique of plastic houses.

**Importance of Research:** The current research comes at the service of policy makers and decision makers in the Ministry of Agriculture and its related entities in the dissemination process of agricultural developments by providing information on the problems of the dissemination process which may serve in the development of the process or similar operations later.

### Materials and Methods

**The research community:** All vegetable growers who are not adopting the plastic house technique in Diwaniyah province, which their number amounted of (202 farmers), distributed among 10 agriculture sectors in the province.

#### The Study Sample:

- A- A random sample were selected with ratio of 50% from the five agricultural sectors (Center of province, Al-Shafa'i, Al-Hamzah, Afak and Al-Budair).
- B- A random sample were selected with ratio of 50% from the farmers who stopped the adoption of cultivation in plastic houses where their number amounted of (65 farmers).

#### Preparing the Reasons Diagram

- From the literature and studies related to adoption of agricultural technique, the diagram of the reasons for the cessation of farmers adoption of the cultivation technique in plastic houses in the province, the three axes of reasons: the reasons related to technique, the reasons related to farmers and their farming systems, and institutional reasons, which included 8 areas: (economic factor, knowledge factor, characteristics of agricultural systems, programs and plans, agricultural policy, services, infrastructure, monitoring, follow-up and evaluation, These areas included 25 paragraphs.
- The diagram was presented to a group of experts in the terms of reference of agricultural extension and horticulture to verify its veracity and validity of the content, threshold cut was identified with ratio of 80% a standard for the survival of any of the components in the proposed reasons diagram, In its preliminary form, where the tool is considered to be honest if it receives the approval of 75% or more of the arbitrators' opinions (Al-Zebari, 2011). The average scores of the experts' approval for each axis, area, and paragraph were calculated in the diagram. All axes, areas and paragraphs obtained percentages of approval ranging from 87% to 94%.

- A questionnaire was prepared for the respondents according to a five-factor significance scale (very important, important, Somewhat important, Little importance, unimportant) and given weights (0-1-2-3-4). A preliminary test was conducted on it for a number of farmers outside the research sample to verify from its suitability and make the necessary adjustments. The reliability coefficient was calculated using the split-half method and Spearman's rank correlation coefficient (Allam, 2009). The values of reliability coefficient ranged from 0.86 to 0.92 degrees, all of which expressed scientifically accepted and researchable factors. Thus, the questionnaire is ready to collect data from the respondents.
- The data were collected by a questionnaire from the respondents during the period between October and December 2017. The weighted average and the percentage weight were used to analyze the data.

### Results and Discussion

First, farmers who did not continue to adopt the agriculture technique in plastic houses indicated 25 reasons, its enemy relevant by not continuing to adopt this technique. The averages degrees of their importance ranged between (2.61-3.92) with an total average of importance amounted of 3.39 degrees. A 36% of the reasons, the averages degrees of their importance ranged between (3.5-3.92 degrees) with an average importance amounted of (3.7 degrees), it lies within a very important level. In the forefront of these paragraphs were the imported products and their low prices, weak domestic product protection, low local vegetable prices in general, pest infestation, Support for production inputs is stopped by the concerned authorities, absence of the agricultural industrial base, Lack of plastic houses. A 52% of the reasons, the averages degrees of their importance ranged between (3.07 to 3.49) with an average importance amounted of (3 degrees). It lies within an important level, among its paragraphs is the lack of economic capacity to purchase good quality inputs, soil salinity, lack of good production, inadequate storage of crops during rush periods, lack of access to prevention services, failure to achieve the advantage of early production. The remaining ratio from reasons which amounted of 12, the averages degrees of their importance ranged between (2.61 to 2.93) with an average importance amounted of (2.8 degrees), which lies within somewhat important. Among their paragraphs are the weakness of the knowledge and skills of the workers in the management of cultivation in plastic houses and in the field of vegetable growing, lack of guidance service, absence of specialized committees to follow the farmers in their farms, Guidance the Agriculture Directorate in the province to focus on the cultivation of potato crop, as shown in tables (1, 2).

**Table 1:** Distribution of the reasons related to the non-continuation of the adoption of the respondents farmers of agriculture technique in plastic houses according to importance levels and averages of their digital values

No.	Level of importance	Limits values of average importance	Average importance	Number	%
1	Very important	3.92-3.5	3.7	9	36
2	Important	3.49-3.07	3	13	52
3	Somewhat important	2.93-2.61	2.8	3	12
4	Little importance	0	0	0	0
5	Unimportant	0	0	0	0
<b>Total</b>				<b>25</b>	<b>100</b>

**Table 2:** The reasons related to the non-continuation of adopting the farmers respondents the agriculture technique in plastic houses and their distribution according to the fields and the average degrees of importance

No.	The reasons	Areas	Average degree of importance	Percentage for the importance of the paragraph
1	Competition of imported products and lower prices for production costs	Agricultural Policy	3.92	98
2	Weak domestic product protection measures	Agricultural Policy	3.90	98
3	Reduce vegetable prices in general	Economic factor	3.75	94
4	Infecting the cultivated Crops with diseases and insects	Characteristics of farming systems	3.73	93
5	Stop subsidies on production inputs (fertilizers, seeds, pesticides) from the relevant authorities	Agricultural Policy	3.70	93
6	Damage to plastic houses	Characteristics of farming systems	3.67	92
7	Lack of obtained loans for the development of agriculture in plastic houses	Agricultural Policy	3.6	90
8	Absence of industrial base (manufacturing)	Infrastructure	3.50	88
9	The lack of plastic houses, therefore, has limited economic benefits	Economic factor	3.50	88
10	Lack of economic ability to purchase good quality of production supplies (structures, Nylon, seeds, fertilizers, pesticides)	Economic factor	3.49	87
11	Soil salinity	Characteristics of farming systems	3.46	87
12	Water scarcity	Characteristics of farming systems	3.46	87
13	Lack of warehouses to store crops especially at rush time	Infrastructure	3.46	87
14	Lack of good production	Economic factor	3.44	86
15	Difficulty in obtaining production requirements (Hybrid, fertilizers, pesticides)	Services	3.36	84
16	Lack of access to prevention services	Services	3.36	84
17	Failure to achieve early production advantage	Economic factor	3.26	82
18	The quality of production is not high quality	Economic factor	3.2	80
19	Weak skills and knowledge of the workers necessary to manage the work in plastic houses	Cognitive factor	3.16	79
20	Weak knowledge and skills to grow vegetables	Cognitive factor	3.09	77
21	Lack of access to agricultural extension services	Services	3.09	77
22	Weak knowledge and skills to manage plastic houses	Cognitive factor	3.07	77
23	work in Full-time to meet the requirements of the management of work in plastic houses	Characteristics of farming systems	2.93	73
24	Absence of specialized committees to follow up farmers in their farms	Monitoring and follow-up	2.92	73
25	Guidance the Agriculture Directorate in the province to focus on the cultivation of potato crop	Programs, plans and Guidance	2.61	65
<b>Average values</b>			<b>3.38</b>	

From Table (1). The following concludes:

- A. The diversity of the reasons identified by the respondents farmers about the cessation of the application of the plastic houses technique.
- B. Most of the reasons came from an important level to a very important one, and there was no little importance reason.
- C. The reasons for the weak protection of the local product and the competition of imported products and the low prices compared to the cost of production are among the first reasons why the farmers stop applying technique, which in practice embodies its danger to the farmer and his agricultural activity, stability and gravity on his Guidance to develop his agricultural activity as well as the danger to agriculture in the country as a whole, Weak control of border ports, weak legislation as well as poor or inadequate agricultural policies.
- D. The infection of the Plant with pests and poor services came from the important reasons to very important, if the farmer does not have the protection of his crops, he cannot develop his agricultural activity and abandon technique.
- E. Characteristics of agricultural systems the reasons were important in stopping the farmers from applying technique and this is consistent with what is stated in the adoption literature that emphasizes this factor.
- F. The weakness of the knowledge and skills of farmers in the field of management of agriculture in plastic houses came among the important reasons as it negatively affects the management of this activity and its results, which leads to the discontinuation of its application, and this indicates the existence of a problem in the service.

**Second:** The reasons related to non-continuation of the use of plastic house technique were divided into eight areas:

- 1- Agricultural policy with their average importance amounted of (3.78 degrees) and lies within the importance level is very important.
- 2- The field of infrastructure with an average importance amounted of (3.48 degrees) and lies within the importance level is important.
- 3- The characteristics field of farming systems with an average importance amounted of (3.45 degrees) and lies within the importance level is important.

- 4- Field of economic factor with an average importance amounted of (3.44 degrees) and lies within the importance level is very important.
- 5- The field of services with an average importance amounted of (3.24 degrees) and lies within the importance level is important.
- 6- The field of knowledge for the farmers with an average importance amounted of (3.08 degrees) and lies within the importance level is important.
- 7- The field of supervision, follow-up and evaluation with an average importance amounted of (2.92 degrees) and lies within the importance level is Somewhat important.
- 8- Field of programs, plans and Guidance with an average importance amounted of (2.92 degrees) and lies within the importance level is Somewhat important as shown in Table (3).

**Table 3:** The reasons related to the non-continuation of the respondents farmers to adopt the agriculture technique in plastic houses and the average degrees of their importance

No.	The areas	Average importance
1	Agricultural Policy	3.78
2	Infrastructure	3.48
3	Characteristics of farming systems	3.45
4	Economic factor	3.44
5	Services	3.24
6	Knowledge factor	3.08
7	Monitoring, follow-up and evaluation	2.92
8	Plans, programs and directives	2.61

From Table (12). The multiplicity, diversity and interaction of areas of reasons for the failure of the non-continuation of the respondents farmers to adopt the agriculture technique in plastic houses.

### Conclusion

There are a number of factors affecting the lack of continuity of the farmers to adoption of the technique of plastic houses in the Diwaniyah province, including weakness of technique dissemination system in all its components.

### Recommendation

The need to pay attention to the dissemination and redeployment of this technology and to overcome the reasons for food security and for the farmers.

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