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FARMERS, PERCEPTION OF CLIMATE CHANGE IMPACTS ON THE SUSTAINABILITY OF VEGETABLE CROPS IN THE SUWAIRA DISTRICT/ WASIT AND AL-MAHMOUDIYA DISTRICT IN BAGHDAD GOVERNORATE

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ABSTRACT

The current study aims to determine farmers' perception on climate change and its impact on vegetable production tomatoes, cucumbers and green pepper…etc., and identify socio-economic shacieteristics as age, education level, marital status, experience in agricultural work, farm size, annual income,.etc. were also recorded influencing their perception of climate change.

This study was conducted in Essaouira and Al-Mahmoudiya districts in Wasit and Baghdad Governorates. Data were collected by using face-to-face interviews from the randomly selected sample of 125 respondents through 1st January to 30th January, 2022. Results indicated that 100% of respondents don't participate in training courses. Results revealed that the majority (60.8%) of respondents have a low perception on climate change impacts. The study recommended raising farmers' perception of climate change needs to increase agricultural extension services and government support to help them to be taken and improve their perception on climate change and its impacts on vegetable production.

Keywords: Farmers' perception, Climate Change, Vegetable crops.

INTRODUCTION

Climate change is widely acknowledged as foremost among the tremendous challenges facing the whole world in the 21st century. It poses challenges to fundamental elements of our understanding of appropriate goals for social and economic policy, such as the connection of prosperity, growth,

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equity, and sustainable development. Iraq is located in the northeast of the Arabian Peninsula to the southwest of the continent of Asia. The astronomical location, Iraq is located between latitudes between longitudes 38-48 degrees east and 29-37 degrees north, so this site has many inclusions[15]:

A- It is located within the northern temperate zone, as this led to the length of the day reaching 14 hours in the summer while declining to approximately 10 hours in the winter. The result is a long growing season that extends to most of the year.

B- The extension between the circles of latitude is limited and its impact on climate and vegetation conditions. This extension has also led to a limited diversity in climatic regions and then the ability to achieve self-sufficiency.

In Iraq, the climate is desert in the middle and south, with hot in the Summer and moderate extremely cold Winter, it is a relatively cold winter and semi-desert in the north of Iraq. While in the northern mountains, the climate is cold and rainy and sometimes snowy in Winter, but it is hot and sunny in the summer season, it is cooler at night than in the morning due to the highland mountains. In Baghdad, July and August mean daily temperatures are about 95 °F (35 °C), and summer temperatures of 123 °F (51 °C) have been recorded [10]. Annual totals vary considerably from year to year, but mean annual precipitation in the lowlands ranges from about 4 to 7 inches (100 to 180 mm). Winter temperatures in Baghdad range from about 35 to 60 °F (2 to 15 °C) [10]. The agricultural sector is considered more vulnerable than the rest of the sectors of the national economy to climate change risks and most important climatic and environmental fluctuations[1]. Both climate change and agriculture interrelated processes occur on a global scale. Agriculture influences climate change and climate change affects agricultural production [7].

Global warming is projected to have significant impacts on conditions affecting agriculture including temperature, humidity, and rainfall. These conditions determine the carrying capacity of the biosphere to produce enough food for the human population and animals feeding. Reduction in crop yields in most tropical and sub-tropical regions will be due to decreased water availability and new or changed insect pest incidence. The agriculture sector is a driving force in the greenhouse gas emissions. This occurs through clearing land for crop production. Iraq's climate change is considered one of the most serious threats to sustainable development with adverse impacts expected on the environment, human health, food security, economic activity, natural resources, and physical infrastructure [8]. Rural areas are highly vulnerable to climate change since people there depend heavily on natural resources such as local water supplies and agricultural land [9]. About 70% of the population in developing countries live in rural areas, where agriculture is their main source of income [19]. The agricultural sector is considered one of the most affected by climate fluctuation and change. Therefore, the combination of the high level of poverty and depletion of the ecosystem increases exposure to climate change effects and might reduce opportunities for sustainable development [10]. Farmers' perception of climate change impacts is one of the basic goals of knowing their Knowledge and skills by applying the new practices to confront climate change and the major challenges it entails that require improving their perception, improving their effectiveness, and improving the services and government support provided to them. This is consistent with the requirements of sustainable

development in the field of vegetable production activity, which is spread in most parts of the country's governorates, including Baghdad and Wasit, Accordingly, the current study was conducted to determine the farmers' perception of climate change impacts on vegetable crops. In this context, the present study has been conducted with a view to the following objectives:

1-Describe the social-economic and personal characteristics of vegetable farmers.

2-Identify the practices of vegetable growers to face climate impacts on vegetable crop sustainability, including the following practices:

a- To reduce the effect of high temperatures.

b- To reduce the effect of drought on vegetable crops.

c- To reduce the effect of salinity on vegetable crops.

3-Identify vegetable growers' perception of climate change impacts on vegetable crop sustainability.

4- The contribution of the socio-economic variables of farmers to their level perception.

5-Identify Problems and obstacles facing vegetable farmers

Methodology

Population and Sampling

The study was conducted at Wasit and Baghdad Governorates in Iraq where people were affected by climate change, especially hot and cold. Farmers who were primarily affected by cold weather were selected as a sample for this study. The research population included the Esuwaira district in Wasit Governorate, which includes (Al-Rahmaniyah, Western Diwaniyah, Jumaysa, Al-jamahir Al-Shamata, Kasiba, Maysilun, Al-Mueamara, Al-Salam, Al-Makasib, Al-Bu Hasuwn and Al-eakidat) villages, then a random sample of 20% was taken, with two village namely Western Diwaniyah and Rahmaniyah were chosen. Also, Mahmoudiya district was chosen within the study area, which included the following villages (Al-Mahmoudiya, Latifia, Al-Rashid, and Youssefiya). Al- Latifia district includes the villages (Al-Latifia, Bzayez, Latifia, Bzayez Al-Yusufiyah, Arab Al-Nabi Sheet, and Tal Al-Samra, Al-Janabin, Al-Bateen, Al-Haswa, Abu Awsaj and Umm Al-Jir). Also, a random sample of 10% was drawn from these villages. Three villages were randomly selected as the area study namely Al-Latifia, Rahmaniyah, and Western Diwaniyah. The total number of farmers' families in the selected villages was 500. A stratified, disproportionately random sample of vegetable growers was chosen (about 25% of the sample), (125) the number of total respondents distributed among three villages (Table 1). The final data were collected during 1st to 30th January 2022. The distribution of the population and sample is shown in Table 1.

Table 1. Distribution of population and sample of farmers of the selected villages.

Name of the districts	Name of the villages	Population	Sample size
Essaouira distract	Western Diwaniyah	200	50
	Rahmaniyah	180	45
Al- Latifia	Al- Latifia	120	30
	Total	500	125

Selection and Measurement of Variables

Selection and measurement of social economic variables in a descriptive social study is a very important task, an organized study usually includes at least two corresponding elements namely, independent variables and dependent variables. Considering the nature of the study, study area, time, and other logistic support, eight farmers' characteristics were chosen as independent variables for data analysis of the study namely: Age, level of education, Marital status, experience in agricultural work, Farm size, Annual family income, Training courses, Organizational participation, Landholding, Information sources and Communication with electronic Agricultural extension. furthermore, the dependent variable of this study was farmers' perception of climate change effects on vegetable crop production. The measurement techniques for both dependent and independent variables are discussed below.

Measurement of Independent Variables

Age of the farmers was measured in term of actual years from his birth to the time of date collected. level of education was measured as respondents received the formal education on a certain level. It was expressed in terms of year of schooling. Farm size of the respondents was measured as the size of his (dunams) farms on which he continued his farm practices during the period of the study. Annual family income indicates the total earnings of a farmer and the members of his family both from agriculture and other socially acceptable regular means such as business, service, etc. It was expressed in thousands of Iraqi dinars during the previous year. Training received was measured by participation in training courses by the respondents' farmer during his life. Participation in mass organizations of a respondent was measured by asking the respondent whether a participant or a non-participant in mass organization. The landholding variable was categorized into four categories (Personality holding, governmental holding, Rent contract, and work as a wage). nformation Source variable was measured by farmers depending on any of the sources to obtain their information related to climate change and its impact on the productivity of vegetables, which included the following sources e.g. (Agricultural extension, Agriculture office, Daily weather forecast, the relative, Neighbors, Friends, and personal information). Communication with the following electronic extension, this variable was measured by which of the social media farmers are using like Facebook, WhatsApp, Viber, Messenger, YouTube, and Telegram.

Measurement of Dependent Variable

Farmers' perception on climate change impacts on vegetable crop production was measured on 36 items by using open-ended questions. Each question contains 2 marks. Farmers' perception was determined by summing up the weights for their responses to all 36 questions. Thus farmers' perception of climate change impacts on vegetable crop production score should range from 0 to 36, where zero (0) indicates no perception and 36 indicates the highest perception.

Collection and Processing of Data

A well-structured interview (questionnaire) was developed based on the objectives of the study. The questionnaire contained both closed and open forms questions. The researchers conducted a pre-test with 30 respondents. Necessary additions, corrections, and adjustments were made to the questionnaire based on the results of the pre-test. Data were collected from 125 respondents by using face-to-face interviews in their free time to give them the right information in a calm mind during January 2022. After finished of data collection, the data were coded, compiled, tabulated, and categorized according to the objectives of the study. The entire individual respondent's data were transferred into a master sheet for use in the required analysis. In the case of qualitative data, an appropriate scoring technique was followed to convert the data into quantitative form.

Analysis of Data

The collected data were fed to the computer through the SPSS package. After arranging data according to the nature and objective of the study descriptive statistics techniques like frequencies, averages, and percentages were analyzed using the SPSS package. To determine the contribution of identified characteristics to farmers' perception of the impacts of climate change on crop production, a multiple regression analysis model was used [23].

RESULTS AND DISCUSSION

Characteristics of the Farmers

The result as shown in table 2 revealed that the majority 64% of the farmers were middle-aged (39-59) years old. These results give a good indication of a possible rise of farmers' perception of climate change, also most of the studies indicated that the level of perception increases when the farmers are young or in the middle age. Most of the respondents, (92.8%) complete (1- 10) years of formal education, which means the majority of crop growers had primary to secondary school, therefore in this study perception level is needed to raise their education level in the area study. The majority (92%) of them got married. About 80.8% of respondents had years' work less than forty years. Most (92%) of the farmers had small to medium farm size. More than two-thirds (72%) of them had low income. About (100%) of the farmers didn't participate in training courses. The majority (96%) of the targeted had nonparticipation in mass organizations. Most (96%) of respondents had private ownership. About two-thirty (70%) of them depended of their relatives, neighbors and friends as a source of their information. More than half of respondents used Facebook for communication with extension workers or agricultural departments Table 2, that mean it can use social media especially Facebook as a tool to dessminate new technologies because the information has been diffused fast among farmers and they are exchanging their conditions and marketing and planting information among them. Farmer use the social media to get a new and useful in formation.

Table 2: Distribution of the respondents according to their socio-economic characteristics (N=125)

Characteristics (Measuring unit)	Categories	Respondents		Mean	SD
		Number	%		
Age (Years)	Young (up to 39)	33	26.4	45.94	8.718
	Middle aged(39-59)	80	64		
	Old (>60)	12	9.6		
(Study years) Education level	Primary (1 - 5)	64	51.2	6.69	2.434
	Secondary (6 - 10)	52	41.6		
	Above secondary (>10)	9	7.2		
Marital status	Married	115	92	2.98	0.179
	Single	9	7.2		
	Divorce	1	0.8		
Experience (years)	Less than 20	24	19.2	35.90	12.239
	20-40	77	61.6		
	>40	24	19.2		
Farm size (Dunam)	Small (less than 1)	25	20	23.53	19.481
	Medium	90	72		
	Large (more than 20)	10	8		
Annual family income(IQD)	Low <1000.000	90	72	5.861	1.918
	Medium 1000.000-3000.000	30	24		
	High>3000.000	5	4		
Training exposure (No. of days)	Participate	0	0		
	Don't participate	0 0 0 125	100	0.00	0.00
Organizational participation)	Participant,	5	4	0.11	0.317
	Non-participant	120	96		
Landholding	Personal holding	120	96	3.55	0.641
	Government holding	5	4		
	Work as a wage	0	0		
Information sources	Agricultural extension,	2	1.6	2.45	0.685
	Agriculture office,	3	2.4		
	Daily weather forecast	40	32		
	Relatives, neighbors,	26	20.8		
	friends, and personal information	54	43.2		
Communication with electronic extension	Facebook	65	52		
	WhatsApp	28	22.4		
	Viber	5	4		
	Messenger	23	18.4		
	YouTube	2	1.6		
	Telegram	2	1.6		

2- Practices of vegetable growers to face climate impacts.

A-High and low temperatures

As shown in Table 3 about 60% of the farmers sometimes plant early maturing varieties of vegetable crops to face climate change, more than fifty percentage of the respondents planted varieties that are tolerant of high temperatures, more than 85% of them planted the vegetable crops in a greenhouse, and 76% of the farmers don't use of organic and biofertilizers to avoid freezing to fertilize their farms, about 77.6 % of the farmers didn't use the sprinkler and drip irrigation, it is an important indicator because the use of this technique in irrigating crops makes the root zone always moist and able to withstand high temperatures, also the results indicated that 79.2% of them didn't Introducing seeds adapted to the Iraqi environment. It is an important indicator in light of the challenges of climatic changes that the agricultural sector in general is exposed to, and the cultivation of vegetable crops in particular, due to their high sensitivity to the rise and fall of temperatures.

Table 3: Practices used to reduce the effect of high and low temperatures

N.	Agricultural practices	Always		Sometime		Don't use	
		Freq.	%	Freq.	%	Freq.	%
1	Planting early maturing varieties	24	19.2	75	60	26	20.8
2	Planting varieties that tolerant of high temperatures	15	12	46	36.8	64	51.2
3	Planting at a greenhouse	107	85.6	11	8.8	7	5.6
4	Use of organic and biofertilizers to avoid freezing	10	8	20	16	95	76
5	Using thick plastic covering or put more than one layer	0	0.0	33	26.4	92	73.6
6	Using the sprinkler and drip irrigation	4	3.2	24	19.2	97	77.6
7	Making a plant fence around the farm	17	13.6	90	72	18	14.4
8	Avoid watering plants at peak time	45	36	65	52	15	12
9	Cultivation the crop under fruit or palm trees	12	9.6	84	67.2	29	23.2
10	Introducing seeds adapted to the Iraqi environment	8	6.4	18	14.4	99	79.2
11	Using soilless technology	7	5.6	8	6.4	110	88

Freq. =Frequency

B. Practices used to reduce the effect of drought on vegetable crops

Data in Table 4 revealed that more than 54% of the farmers planting of low-water-requiring crops, nearly 50% of them sometimes watering at specific times or when the plant needed it, only 25.6% of study sampling watering the plants by suitable quantities, but 82.4% of farmers don't watering their crops by using drip or sprinkler system, and 80% of them don't investing the groundwater to reduce using a surface water in watering their farms, also no one of the farmers in target area adopting the conservation agriculture technique, about 81.6% respondents don't have the available infrastructure, in regarding the application of modern technology, finely only 19.2% of the farmers watering their farm at the right times and the right amount.

Table 4: Practices used to reduce the effect of drought on vegetable crops

N.	Agricultural practices	Always		Sometime		Don't use	
		Freq.	%	Freq	%	Freq	%
1	Planting of low-water-requiring crops	10	8	47	37.6	68	54.4
2	Watering at specific times or when the plant needs it	14	11.2	62	49.6	49	39.2
3	Watering the plants in suitable quantities	32	25.6	70	56	23	18.4
4	Irrigation of the crops by using a drip or sprinkler system	7	5.6	15	12	103	82.4
5	Planting windbreaks around the farm	49	39.2	57	45.6	19	15.2
6	Using organic fertilizer	32	25.6	53	42.4	40	32
7	Avoid burning previous crop residues to reduce surface water loss	22	17.6	70	56	33	26.4
8	Investing a groundwater to reduce using of surface water	7	5.6	18	14.4	100	80
9	Using the agricultural cycle to keep the soil from stress	15	12	46	36.8	64	51.2
10	Adopting the conservation agriculture technique	0	0	0	0	125	100
11	planting new and early ripening hybrids and vegetable crops	12	9.6	38	30.4	75	60
12	Unavailable infrastructure, regarding the application of new technology	5	4	18	14.4	102	81.6
13	Reducing crop planting that needs high water consumption	10	8	31	24.8	86	68.8
14	Irrigation at the right times and the right amount in each irrigation	24	19.2	57	45.6	44	35.2

Freq. = Frequency

C. Practices used to reduce the effect of salinity on vegetable crops

According to Table 5 results, only 9.6% of the respondents always plant salt-tolerant vegetable crops, around 79.2% of the farmers in the area study don't watering the crop by using the drip irrigation system, and more than 91% of them also don't plant their crops by using sprinkler Irrigation, only 8% of them following the agricultural cycle, and 67.2% of the vegetable growers don't Making internal drains to remove the soil salt, but 72% of them always exploiting and planting all agricultural lands to prevent desertification, about 78.4% of the respondents don't planting crops whose roots reach to the groundwater, at last only 5.6% of them always changing planting dates to suit new weather conditions.

Table 5: Practices used to reduce the effect of salinity on vegetable crops

N.	Agricultural practices	Always		Sometime		Don't use	
		Freq.	%	Freq.	%	Freq.	%
1	Planting of salt-tolerant vegetable crops	12	9.6	71	56.8	42	33.6
2	Watering the crop by using the drip irrigation system	9	7.2	17	13.6	99	79.2
3	Planting crops by using sprinkler Irrigation	2	1.6	9	7.2	114	91.2
4	Following the agricultural cycle	10	8	25	20	90	72
5	Making internal drains to remove the soil salt	13	10.4	28	22.4	84	67.2
6	Avoid overwatering	15	12.0	54	43.2	56	44.8
7	Exploiting and cultivating all agricultural lands to prevent desertification	90	72	27	21.6	8	6.4
8	Following the agricultural cycle	12	9.6	32	25.6	81	64.8
9	Reducing chemical fertilizers	19	15.2	16	12.8	90	72
10	Remove the top layer of soil	23	18.4	78	62.4	24	19.2
11	planting crops whose roots reach to the groundwater	10	8	17	13.6	98	78.4
12	Changing planting dates to suit new weather conditions	7	5.6	39	31.2	79	63.2

Freq. :Frequency

3- level of farmers' perception of climate impacts on the sustainability of vegetable crops.

Farmers' perception level scores ranged from 20-48 against the possible range of 0-36. The mean perception was 21.92 degrees with a standard deviation of 13.0 respectively. Based on the perception level of the respondents were classified into three categories "low perception", "medium perception" and "high perception". So distribution of the respondents according to their perception of climate change effects on vegetable crop production scores is shown in Table 6. The outcomes of this study showed that the majority (60.8%) of the farmers had a low perception of climate change, while (31.2%) of them had a medium perception, and only (8%) of respondents had a high perception. According to the above, we can say that the farmers who have a low to medium perception of climate change, however, (8%) of them still possess a high perception of climate change effects on vegetable crop production, so to increase farmers' perception it is necessary to focus and study their social and economic characteristics [20], because they play a role in farmers' adoption such as sharing in training courses, participation in mass organizations and Communication with the following electronic extension..etc. [2].

Table 6: Distribution farmers according to their level perception on climate change effects in vegetable crops production

Categories	Respondents		Mean	SD
	Number	%		
Low perception (20-29)	76	60.8	21.92	13.0
Medium perception (30-39)	39	31.2		
High perception (40-49)	10	8		
Total	125	100		

4. The contribution of the socio-economic variables of the farmers to their level perceptions

The contribution of the socioeconomic variables of the farmers to their level of perception of climate change effects on vegetable crop production has been viewed in Table 7. The results indicated that only three variables e.g. Study years, mean farmers with more education have more perception level. Also, farm size and Annual farmers' income were found to have positive and significant effects on farmers' perceptions. These results is in agree with Taraba [20], who viewed that there was a significant relationship between perception level and personal characteristics, also these results supported by [12], also [5], and [23] who showed in their studies that farmers' perception influenced by the farm size and farmers' income farmers' education level found to be effective parameters in the level of farmers 'perception.

Table 7: Multiple regression coefficients of the contributing socio-economic variables of the farmers' perception on climate change effects in vegetable crops production

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.330[a]	0.109	0.090	0.16446
2	0.426[b]	0.181	0.146	0.15936
3	0.514[c]	0.264	0.215	0.15275

a. Predictors :(Constant). Study Years
b. Predictors :(Constant). Study years, Farm size
c. Predictors :(Constant). Study years, Farm size, Annual income
d. Dependent Variable: Level Perception

5. The Problems and obstacles faced the vegetable farmers

The important problem and obstacle revealed by respondents, as Table 8 shows were the lack of government support (94.4%), its ranked first in the list of problems and obstacles, this result was supported by Challob *et al.* [6]. Also a lack of agricultural extension services problem (90.13%), so it's ranked as the second problem. The high costs of agricultural inputs of the vegetable crops (89.86%) also respondent the main problem, then failure to encourage farmers to adapt to the IPM (89.07%) also can be considered as one of the important obstacles are faced by the extension workers to explain the new technology. Decreased financial revenues from selling vegetables (88.8%) were indicated as a major problem facing the growers. Other problems and obstacles such as difficulty accessing agricultural extension, the lack of a national program related the climate change and the lack and poor highways reaching to the local markets are founded with little effects among the respondents.

Table 8: The Problems and obstacles are faced the vegetable growers

N.	Problems and obstacles	Impact degree			Weighted mean	Weight percentile
		High Influence	Medium influence	Low influence		
1	Lack of government support	107	15	3	2.83	94.4
2	Lack of agricultural extension services	94	25	6	2.70	90.13
3	The high costs of agricultural inputs for the vegetable crops	95	22	8	2.696	89.86
4	Failure to encourage farmers to adapt to the IPM	97	15	13	2.67	89.07
5	Decreased financial revenues from selling vegetables	89	30	6	2.66	88.8
6	Shortage of organic and biofertilizers	91	24	10	2.648	88.27
7	Difficulty in obtaining loans and the high interest rates	82	35	8	2.59	86.4
8	Weak infrastructure to apply modern technology	81	26	18	2.50	83.47
9	High prices of crops hybrid	75	37	13	2.50	83.33
9	High costs of agricultural labor	80	25	20	2.48	82.67
10	No effective to public organizations	65	48	12	2.42	80.8
11	The lack of marketing services	70	36	19	2.40	80
12	Difficulty access to agricultural extension	64	45	16	2.38	79.47
13	Lack of a national program which related at climate change	70	32	23	2.38	79.2
14	Lack and poor highways reaching to the local markets	36	78	11	2.20	73.3
15	Lack of suitable large areas	26	89	10	2.13	70.93

6- Participation in training courses related to the cultivation and production of vegetable crops under the influence of climatic changes

The results of this study as shown in Table 9 indicated that (100%) of farmers didn't share in training course in all items of related to the cultivation and production of vegetable crops under the influence of climatic changes. Although of the training courses of farmers were aimed at building the competencies and skills capabilities of the farmers in order to improve their farm practices and productivity. So the impact of training in changing farmers' livelihood has not been explored extensively so far, training for farmers has been proven to yield variety of results. Therefore the perception level of the

respondents were found low due to the farmers sharing in any training course in impacts of climate change, confirms the importance of training can contribute to enhancement of farmers‘ skills in farming works. Studies on the effectiveness of training for farmers like the study of [16] on their study on Bangladeshi small farmers concluded that building the capacity of farmers through training is more valuable than the provision of financial support in terms of raising production and income. Also, Tripp *et al.* [21] explained that not all programmers meet success as most failures of programmers in developing countries were attributed to the tendency of excessively concentrate on a particular technology transfer rather than a broader spectrum of farmer empowerment including knowledge dissemination. However, these gaps could be overcome by carefully revising and designing the training to address the needs. [24] It has been reported that some success stories were related to using non-formal education and a learning-discovery approach, and filling in the gaps in farmers' knowledge misconceptions [18] and [7].

Table 9: Participation in training courses related to the cultivation and production of vegetable crops under the influence of climatic changes

N	Sharing in a training course in:	Participation in training courses		Non. Participation in training courses	
		N.	%	N.	%
1	Practices used to reduce the effect of high and low temperatures	0	0	125	100
2	Reduce the effect of drought on vegetable crops	0	0	125	100
3	Practices used to reduce the effect of salinity on vegetable crops	0	0	125	100
Total		0	0	125	100
Mean		0	0	125	100

6- Conclusions and Recommendation

The aim of this study was to measure perception farmers vegetables level of impact climate change and the socio-economic variables that are associated with the their level perception effects in sustainable vegetable crops production in Wasit and Baghdad Provinces. The study' outcomes suggested that vegetable growers should increase their perception and knowledge of climate change on the sustainability vegetable agricultural and in area study. Also, lack of extension activities and services directed to vegetable farms by agricultural extension departments in the study area. It is necessity to involve the vegetable growers in training courses related to climate change and its impact on their vegetable production. also they should be encouraged to participate them to mass organizations in order to make relationships with other farmers and exchange information and experiences between them. Investing in social media, especially Facebook and WhatsApp, to disseminate relevant information and recommendations to increase farmers' perception in effects of climate change. Therefore, still there have range to improve farmers' perception scenario through different ways and steps. study years, farm size, annual income of the vegetable growers were very important in making high perception on climate change effects in sustainable vegetable crops production. The outcomes of this study concluded establishment of more government support, training courses

received, communication with the following electronic extension agricultural and participation in mass organizations with farmers related variables will increase farmers' perception on climate change effects. Also problems and obstacles had a clear effects on the low level of perception of vegetable growers, e.g. Government support, agricultural extension services, reduced costs of agricultural inputs of the vegetable crops, encourage farmers to adapt the IPM, Decreased financial revenues from selling vegetables, Difficulty in obtaining loans and the high interest rates, Weak infrastructure to apply of modern technology, High prices of crops hybrid…etc. Therefore government and the extension workers should increase their supported and extension services provided to the farmers, so more training, participation in mass organizations and extension agricultural program meeting and demonstration should be arranged in order to make more perception on climate change effects. All these initiative probably will help the farmers in study area to get high perception which sure encourage them to adaptation strategies to minimize harmful effects of on climate change effects in sustainable vegetable crops production [7], in addition the farmers need the government supporting to increase their adoption of modern technologies, such as purchasing sprinkler or drip irrigation systems conservation agriculture technology for increasing their perception and reduce the problem of water scarcity and drought.

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ادراك الزراع لتأثير التغيرات المناخية على استدامة محاصيل الخضر في قضائي الصويرة/محافظة واسط وقضاء المحمودية في محافظة بغداد

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الملخص

هدفت الدراسة الحالية الى تحديد ادراك مزارعي الخضر الى التغييرات المناخية وتأثيرها في انتاج الخضر كالطماطة والخيار والفلفل الاخضر وغيرها، وتحديد مجموعة المتغيرات الاجتماعية والاقتصادية كالعمر والتحصيل الدراسي والحالة الزوجية وسنوات العمل وحجم الحقل والدخل السنوي.... الخ. المؤثرة على مستوى ادراكهم للتغييرات المناخية وتأثيره في انتاجهم من محاصيل الخضراوات. اجريت الدراسة في قرية اللطيفية من قضاء المحمودية في محافظة بغداد وقرية الديوانية الغربية من قضاء الصويرة في محافظة واسط. جُمعت البيانات عن طريق المقابلة وجهاً لوجه مع العينة التي اختيرت عشوائياً والبالغة 125 مبحوثاً في اثناء شهر كانون ثاني 2022. بينت نتائج الدراسة ان 100 % من المبحوثين لم يشاركوا في الدورات التدريبية في مجال التغييرات المناخية وتأثيرها في الانتاج الزراعي، وان الغالبية العظمى (60.8%) من المبحوثين لديهم مستوى ادراك منخفض. اوصت الدراسة بانه هناك حاجة لرفع مستوى ادراك مزارعي الخضر من خلال زيادة الدعم الحكومي والخدمات المقدمة لهم ومساعدتهم في تحسين ادراكهم للتغييرات المناخية وتأثيرها في انتاج الخضر.

الكلمات المفتاحية: ادراك المزارعين، التغييرات المناخية، محاصيل الخضر.

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