



Financial, Institutional, and Humanitarian Risks and Their Impact on Tomato Cultivation in Sulaymani Governorate

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Abstract

The research aimed to identify the level of financial, institutional, and humanitarian risks facing tomato farmers in Sulaymani Governorate, Furthermore, the study aimed to assess the variability in farmers' viewpoints with regard to these risks based on the pertinent research variables. The data were collected using a questionnaire and a personal interview method by taking a multi-stage random sample by selecting three areas famous for growing tomatoes in Sulaymani Governorate with (1750) farmers, Then, in the second stage, a proportional stratified random sample of (16%) was taken from the research population, so the sample size was (280) farmers. The results showed that the level of financial, institutional, and humanitarian risks facing tomato farmers is high, tending to medium. The results showed that there is a difference in farmers' opinions regarding the financial, institutional, and humanitarian risks facing tomato farmers in accordance with the specified research variables, (Age, Type of farm holding, Volume of tomato production during the year, Contact with the agricultural extension, Sources of agricultural information), While there is no discrepancy in farmers' opinions regarding financial, institutional, and humanitarian risks according to the research variables (Educational level, Years of agricultural experience, Size of farm holding, Participation in training courses) Therefore, the researchers recommend diversifying the crops grown in addition to tomatoes, preparing an integrated agricultural indicative plan, and providing occupational safety and health for workers on the farm to reduce the financial, institutional, and humanitarian risks in tomato production.

Key words financial risks, institutional risks, human risks, tomato crop

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Introduction

Agricultural risks exert a substantial impact on agricultural operations, the livelihoods of farmers, the entirety of the value chain, associated enterprises, and the overarching economy, [1] these risks could be the main indicators of farmers' declining interest in agribusiness.[2] Hence, the enhancement of the agricultural sector and the adoption of contemporary production methodologies are not merely aspirational objectives pursued by developing nations in the present era; instead, they are deemed imperative imperatives for the inception and achievement of economic development on a broader scale. [3] Nations across the globe endeavor to attain comprehensive agricultural development, and as such, they have embraced a multitude of strategies and mechanisms to foster progress in their agricultural sectors. These approaches encompass the formulation of efficacious policies aimed at addressing various categories of agricultural risks, including institutional, humanitarian, and financial risks. These risks collectively contribute to diminished productivity and reduced yields in agricultural production. This increases the fears of the agricultural producer, limits investment in the agricultural sector and influences the production decision. [4] Institutional risk refers to unexpected changes in the provision of basic services, such as the provision of credit, the supply of necessary inputs, and the transmission of information, whether these services are provided by formal or informal institutions. In addition, these risks also indicate uncertainty related to government policies affecting the agricultural sector. As for humanitarian risks, they refer to the vulnerability and exposure of farmers and operators in the agricultural sector as a result of things such as diseases affecting crops or livestock, as well as the personal situation of the farm family. In addition, this category includes issues associated with hired workers, [5] Financial risk pertains to the inherent uncertainties associated with the financial structure of a farm, characterized by the amplified variability observed in a farm's

operational cash flow attributed to the fixed financial commitments associated with the utilization of credit mechanisms. [6]

Governments worldwide, including those in developing nations, have recognized the significance of governmental bodies, particularly Agricultural Extension Services, in fostering progress in agricultural development. [7] Through its multifaceted functions, which encompass human resource development through training initiatives, it possesses the capacity to contribute significantly to rural development,(14) the adequacy of coordination between agricultural sector departments and agricultural banks in the credit program, the effectiveness of farmers' organizations in transferring modern technology to agricultural areas, and there is a comprehensive and complete approach to agricultural development programs and encouraging the efficiency of agricultural research, extension, and information systems in the agricultural sector. [8, 9, 10, 11, 12, 13]

Agricultural extension serves as a primary instrument to augment agricultural output, promote the welfare of rural households, and elevate their quality of life [14, 15] by improving the means of production from both the administrative standpoint and taking care of marketing crops, [16] Furthermore, it facilitates educational transformations by disseminating the outcomes of agricultural research, thereby influencing the knowledge, competencies, and perspectives of farmers and their households. [17] On the other hand, the cultivation of vegetables of all kinds is of great economic importance to some countries because of their export capacity, as they constitute an important part of their national economy, in addition to the short life cycle of the plant, high productivity per unit area compared to other crops, rapid financial returns, and the spread of manufacturing plants. and food packaging, [18] Statistics indicate an increase in demand for agricultural commodities of vegetable crops due to the increase in population, high standard of living, and the spread of health and nutritional awareness. [19] The world's

vegetable production has achieved tremendous growth in the past 50 years due to the adoption of new technology such as modern production practices, new diverse seeds, and mechanization of agriculture with vegetable production reaching around 1.1 billion tons in 2019 [20], The crop ranks sixth among the most consumed crops worldwide, [21] Among the various vegetables, tomatoes account for about 60% of the total fresh vegetables produced in the world. [22] The tomato crop (*Solanum lycopersicum* L.) is considered one of the important crops from a nutritional standpoint because its fruits contain many mineral elements, and they contain carbohydrates, proteins, fats, and vitamins, these factors hold a significant role in human health. [23, 24] aside from its nutritional importance, it is a major source of income for farmers, especially smallholders.[24]

Iraq, especially the Kurdistan Region, is one of the regions where tomato cultivation is good due to its suitable climatic conditions and arable areas, Despite the factors suitable for growing tomatoes, its production does not meet the needs of consumers in terms of quantity and quality [16] Given the risks that arise during the production and marketing of this product, which include production, marketing and financial risks, as well as risks of an institutional and humanitarian nature. Some studies indicate that financial, institutional, and humanitarian risks hurt tomato farmers all over the world, especially in developing countries Including the study [25] in Jordan and the study [26] in Tanzania where they confirmed in their study that social, economic, and institutional factors affect tomato cultivation among small-scale farmers, both the quantity and quality of agricultural products exhibit discernible variations. It can be asserted that the primary socio-economic determinants influencing production are the dearth of capital and the accessibility of extension services [27] Furthermore, it is worth noting that the magnitude of influence exerted by socio-economic and institutional factors varies depending on the specific crop and its associated production technologies. Variables such as age, labor resources, landholding size,

income, household composition, marital status, educational attainment, and farming experience play pivotal roles in this context. [28]

Sulaymani Governorate is one of the important regions of the Kurdistan Region of Iraq, which occupies advanced ranks in the production and marketing of the tomato crop, where tomatoes are grown open or protected. The cultivated area of the tomato crop for the year 2022 in Sulaymani Governorate reached (22,733) dunums, while the estimated production of the tomato crop in Sulaymani was (79,566) tons. According to numbers and statistics, the Kurdistan Region needs about 185 thousand tons of tomatoes annually. Local farmers produce only 55% of this quantity; the residual quantity is sourced through imports from external regions. This decrease in crop productivity can be attributed to several reasons, including productivity and marketing risks in general, and institutional and humanitarian financial risks in particular. This means that the reality of the situation indicates that there is a defect in tomato production and marketing in Sulaymani Governorate, Hence, the conceptual basis for this study originates from the formulation of the ensuing research inquiries:

1. What is the level of financial, institutional, and humanitarian risks for tomato farmers in Sulaymani Governorate?
2. Does a dissonance exist between the independent variables examined by the respondents and the financial, institutional, and humanitarian risks confronted by tomato farmers in Sulaymani Governorate?

Research Objectives

1. Identify the level of financial, institutional, and humanitarian risks facing tomato farmers in Sulaymani Governorate in general.
2. Arranging the fields and items of financial, institutional, and humanitarian risks facing tomato farmers in Sulaymani Governorate.
3. Determine the variance between the independent variables studied by the respondents and the financial, institutional, and humanitarian risks facing tomato farmers in Sulaymani Governorate.

Research Hypotheses

There are significant differences between the level of financial, institutional, and humanitarian risks facing tomato farmers in Sulaymani Governorate and each of the following variables: (Age, Educational level, Agricultural experience in the field of tomatoes, Size of farm holding, Type of land holding, Volume of agricultural production during the year, Number of times Contact with the agricultural extension worker, Participation in training courses in the field of tomato cultivation, Exposure to agricultural information sources.

Materials & Methods

Research methodology

In the course of this research, the investigators employed a descriptive approach in conjunction with the survey study method, as it aligns with the inherent characteristics of the phenomenon under examination. This method is instrumental in elucidating the interconnections among various factual elements and providing a comprehensive explication thereof. The descriptive method was employed in collecting the data required by the research topic, in addition to analyzing

that data to obtain more accurate and objective facts. [29] It consists of identifying the institutional, humanitarian, and financial levels facing tomato farmers in Sulaymani Governorate.

Research area

The selection of Sulaymani Governorate as the research area was predicated on the substantial concentration of tomato cultivators within the governorate, upon whom the livelihoods of a significant proportion of the local populace hinge.

Research population and sample

The research population included all tomato farmers in Sulaymani Governorate, numbering (2900) farmers distributed in different areas in the governorate. Then, a multi-stage random sample was taken by selecting three areas known for growing tomatoes, The study focused on registered tomato farms in the Sulaymani Agriculture Directorate for the fiscal year 2022-2023 with a total of (1750) farmers, in the second stage, a proportional, stratified random sample of (16%) was taken, consisting of (280) farmers, as depicted in Table 1

Table: 1. Distribution of Respondents within the Research Population and Sample

N.	Governorates	Areas names of Tomato	Population	Sample 16%
1.	Sulaimani	Penjwen	1050	168
		Sharazur	250	40
		Bazian	450	72
Total		3	1750	280

Data collection tool:

The questionnaire was used to collect data from respondents, as the questionnaire is one of the good means through which information, data, and facts can be obtained as it gives more objective data than other data collection methods to achieve the research objectives, [30] to achieve the research objectives, a special questionnaire form was prepared for this purpose. The form consisted of two parts: The first part included the personal variables of the respondents, which

are (Age, Educational level, Agricultural experience in the field of tomatoes, area of agricultural land, Type of land tenure, Volume of production during the year, Number of times of contact with the agricultural extension worker, Training courses in the field of tomato cultivation, Exposure to agricultural information sources). Regarding the second part of the form, the test included (24) test items distributed among the axes as depicted in Table (2):

Table: 2 Distribution of research items perceptual axes

N.	Axes	Items
1	Institutional Risks	10
2	Human Risks	7
3	Financial risks	7

Total

24

Measuring the dependent variable:

The level of risk consists of three areas: The first axes is institutional risks, which consists of (10) items. The second axes is humanitarian risks, which consists of (7) items. The third axes is financial risks, which consists of (7) items. A four-point scale was used (strongly agree, agree, somewhat agree, disagree), and weights were given to them (4, 3, 2, 1) respectively. The scores on this scale ranged from 24 to 96 degrees.

Results & Discussions:**1. Identify the level of financial, institutional, and humanitarian risks**

.Table 3: The allocation of respondents based on their risk level distribution

Categories	Frequency	%	Average Risks	Std. Deviation
(24 – 47) Low	3	1.1	32.33	
(48 – 71) Medium	80	28.5	63.41	10.50
(72-95) High	197	70.4	80.75	
Total	280	100	75.27	

As evident from Table (3), the predominant proportion of respondents, comprising 70.4%, was situated within the high-risk category. Followed by (28.5%) of the respondents in the middle category, meaning that (98.9%) of the respondents were in the high and medium categories. Therefore, the level of risk can be described as high, tending to medium. This may be due to the weak agricultural infrastructure in the governorate, the lack of government support for farmers, or the lack of skills and difficult working conditions for many farmers, as well as the difficulty of accessing financing, fluctuations in market prices, debts, and financial challenges, which affect the profitability of farmers and the sustainability of their businesses.

.Table 4. distribution of respondents based on their respective levels of financial risks

Financial risks	Frequency	%	Average Risks	Std. Deviation
(7 – 14) Low	4	1.4	9.00	
(15 – 22) Medium	37	13.3	16.62	3.90
(23-30) High	239	85.3	24.75	
Total	280	100	23.45	

Evidently discernible from Table (4) is the fact that the preeminent proportion of respondents, amounting to 85.3%, belonged to the high-risk category, followed by 13.3% of respondents situated in the middle-risk

facing tomato farmers in Sulaymani Governorate in general.

The findings of the study revealed that the minimum numerical value observed for the level of institutional, humanitarian, and financial risks facing respondents in Sulaymani Governorate was (25) degrees while the highest value was (95) degrees, with a mean value of 75.27 degrees and a corresponding standard deviation of 9.46. Utilizing the range law, the survey participants were categorized into three distinct groups, as delineated in Table (3).

1.1 Identifying the level of financial risks facing respondents in Sulaymani Governorate

The findings of the study indicated that the minimum numerical assessment for the magnitude of financial risks encountered by respondents in Sulaymani Governorate stood at 7 degrees, while the maximum measurement reached 28 degrees. The mean value was calculated to be 23.66 degrees, with a corresponding standard deviation of 3.50. Utilizing the range law, the survey participants were categorized into three distinct groups, as delineated in Table: 4

category. In other words, it can be deduced that a substantial 98.6% of the respondents fall within the high and medium categories, consequently characterizing the financial risk level as predominantly high, with a

propensity toward medium, this may be because tomato cultivation requires high costs for purchasing seeds, fertilizers, pesticides, water, and labor. If those costs suddenly rise, they can significantly impact profitability.

1.2 Identifying the level of institutional risks facing respondents in Sulaymani Governorate:

The study's outcomes revealed that the minimum numerical value denoting the extent

Table 5. distribution of respondents based on their respective levels of institutional risks

Institutional risks	Frequency	%	Average Risks	Std. Deviation
(10 – 19) Low	7	2.5	15.85	4.80
(20 – 29) Medium	105	37.5	26.09	
(30-40) High	168	60.0	33.38	
Total	280	100	30.21	

Evidently discernible from Table (5) is the fact that the predominant proportion of respondents, constituting 60.0%, were categorized as belonging to the medium-risk category, closely followed by 37.5% of respondents positioned within the high-risk category. In light of the data, it is evident that a significant 97.5% of the respondents are situated within the high and medium risk categories, thus characterizing the institutional risk level as predominantly medium with a tendency toward high. This may be because managing the production, marketing, and crop distribution processes in an agricultural project requires good coordination and effective cooperation among

of institutional risks encountered by respondents in Sulaymani Governorate was recorded at 10 degrees, while the maximum value reached 40 degrees. The computed mean was 30.21 degrees, accompanied by a standard deviation of 4.80. Utilizing the range law, the survey participants were categorized into three distinct groups, as delineated in Table (5):

the participants, if these processes are not well organized, they can lead to financial losses and poor sustainability of the project.

1.3 Identifying the level of humanitarian risks facing respondents in Sulaymani Governorate:

The findings of this study indicate that the lowest numerical assessment for the magnitude of humanitarian risks encountered by respondents in Sulaymani Governorate was recorded at 7 degrees, while the highest measurement reached 28 degrees. The calculated mean value was 21.72 degrees, and the associated standard deviation was 4.06. Utilizing the range law, the survey participants were categorized into three distinct groups, as delineated in Table (6):

Table 6. distribution of respondents based on their respective levels of humanitarian risks

Humanitarian risks	Frequency	%	Average Risks	Std. Deviation
(7 – 13) Low	11	3.9	10.81	4.06
(14 – 20) Medium	96	34.3	18.29	
(21-28) High	173	61.8	24.14	
Total	280	100	21.61	

Evidently discernible from Table (6) is the fact that the predominant proportion of respondents, constituting 61.8%, were categorized as belonging to the medium-risk category, closely followed by 34.3% of respondents positioned within the high-risk category. This distribution underscores the fact that a substantial 96.1% of the respondents fell within the high and medium risk categories. so the level can be described the humanitarian risk is moderate to high, This may be due to a lack of control over the

efficiency and number of workers, in addition to not training and directing them properly.

2. Arranging the fields and items of financial, institutional, and humanitarian risks facing respondents in Sulaymani Governorate:

1.2 Ranking of the fields of financial, institutional, and humanitarian risks

The research results showed that there is a difference in the financial, institutional, and humanitarian risks facing respondents in

Sulaymani Governorate, as depicted in Table 7:

Table 7. Ranking of the axis of financial, institutional, and human risks facing respondents

fields	maximum degree of the axis	Average of Risks	Weight %	Std. Deviation	Rank
Financial risks	28	23.45	83.75	3.90	1
Humanitarian risks	28	21.61	77.17	4.06	2
Institutional risks	40	30.21	75.52	4.80	3

It is clear from Table (7) that the axis of financial risks ranked first compared to other risks, according to a weighted average score of (23.45) and a percentage weight of (83.75), Farmers may need investments in modern agricultural technology and equipment, because tomato cultivation requires large investments in fixed assets such as land and equipment, and this poses a financial challenge, as for the axis that ranked last, it is the axis of institutional risks according to a weighted average score of (30.21), and with a

percentile weight of (75.52), it may be less important to the respondents compared to other axis.

2.2 Arrangement of items in the axis of financial, institutional, and humanitarian risks

The items in the axis of financial, institutional, and humanitarian risks include (24) items, arranged according to the percentage weight received by each item in the axis, as depicted in Table 8:

Table 8: Arrangement of items in the fields of financial, institutional, and human risks facing tomato farmers

N.	Items	Mean of Risks	Weight %	Ranking
1.	Lack of facilities for exporting tomatoes abroad.	3.62	90.50	6.5
2.	Accumulation of large debts on the farmer during tomato production.	3.74	93.50	3
3.	Delay in the amount of money to be paid to the farmer by the warehouses and companies for his produce.	2.51	62.75	20
4.	The lack of a strong economic infrastructure to reduce tomato costs by the state.	3.64	91.00	5
5.	Failure to provide agricultural loans for tomato producers for a long time.	3.68	92.00	4
6.	High taxes on agricultural loans, especially for tomato growers.	2.73	68.25	19
7.	Lack of a special fund to compensate tomato producers for damage by the responsible agencies, especially during natural disasters.	3.75	93.75	2
8.	Lack of scientific cooperation between agricultural institutions and farmers during tomato production.	3.51	87.75	8
9.	Instability in the economic and political situation in the country and its impact on tomato producers.	3.76	94.00	1
10.	Lack of supervision of tomato production projects by tree relations agencies.	3.62	90.50	6.5
11.	Lack of records and documents required to protect tomato production projects by agricultural institutions.	3.23	80.75	15
12.	Unavailability of cooperative societies for tomato producers.	2.93	73.25	18
13.	The presence of a large number of unlicensed businesses and their lack of regulation by state institutions.	3.35	83.75	11
14.	Lack of a law for farmers to observe the conditions of production, transportation, storage, and sale of tomatoes.	3.24	81.00	14
15.	Occupation of agricultural land for tomato production by investment companies and high-ranking officials	2.26	56.50	22
16.	Lack of membership of tomato growers in agricultural institutions.	2.43	60.75	21
17.	Failure to comply with the contracts due to negligence on the part of the farmer.	2.14	53.50	24
18.	Lack of farmer expertise in tomato production.	3.34	83.50	12
19.	Lack of protective equipment when using pesticides.	3.39	84.75	10
20.	Dangers of machines to farmers when misused in tomato harvesting.	2.96	74.00	17
21.	Existence of inheritance problems and their impact on tomato production.	2.25	56.25	23
22.	The phenomenon of farmers moving from the countryside to the city on tomato production.	3.03	75.75	16
23.	Lack of health and safety insurance for tomato farmers.	3.44	86.00	9
24.	Lack of use of new technologies by farmers.	3.31	82.75	13

It is clear from Table (8) that the item (Instability in the economic and political situation in the country and its impact on tomato producers) ranked first according to a weighted average score of (3.76) and with a percentage weight of (94.00%), the reason for this may be that the instability of the political and economic situation could lead to the interruption of important agricultural resources and supplies, such as fertilizers, pesticides, and water needed for agriculture. This can negatively affect the quality and quantity of tomato crops, while the item (Failure to comply with the contracts due to negligence on the part of the farmer) ranked last according to a weighted average score of (2.14) and a percentage weight of (53.50%), perhaps less important compared to other obstacles in growing the tomato crop.

3. Determine the variance between the independent variables studied by the respondents and the financial, institutional, and humanitarian risks facing respondents:

The study's findings revealed that the age distribution of the respondents spanned from 19 to 78 years, with a mean age of 38.01 years. Subsequently, the respondents' ages were stratified into three distinct age groups. The data analysis indicates that the most prominent proportion, constituting 54.6%, is situated within the age bracket of 19 to 38 years, while the least represented group, accounting for only 5.4%, corresponds to the age range of 59 to 78 years. To examine disparities among the mean values of financial, institutional, and humanitarian risk levels encountered by respondents across various age groups, an analysis of variance (ANOVA) was employed. The computed ANOVA statistic yielded a value of 6.576, surpassing the critical (F) value from the table. Consequently, the research hypothesis is affirmed. This implies that there exist variations in the viewpoints of respondents belonging to diverse age groups concerning

financial, institutional, and humanitarian risks, as illustrated in Table (9). Furthermore, regarding education the findings revealed that the most substantial proportion, accounting for 42.1%, was observed among individuals in the category of primary education graduates, whereas the lowest representation, at 7.5%, pertained to the High School category. To assess variances in the mean levels of financial, institutional, and humanitarian risks experienced by respondents across different educational levels, an analysis of variance (ANOVA) was employed. The computed ANOVA statistic yielded a value of 1.093, which falls below the critical (F) value at a significance level of 0.05. As a result, the research hypothesis is rejected, this implies that respondents, categorized by their educational attainment, exhibit uniformity in their perspectives concerning financial, institutional, and humanitarian risks, as illustrated in Table (9).

The research findings indicate that farmers possess a range of agricultural experience spanning from 1 to 50 years, with an average of 13.06 years. Notably, the highest proportion, comprising 69.6% of the respondents, reported having between 1 to 16 years of agricultural experience, while the least represented group, accounting for 4.3%, reported an agricultural experience of 34 to 50 years. To examine disparities in the mean levels of financial, institutional, and humanitarian risks encountered by respondents concerning their years of agricultural work, an analysis of variance (ANOVA) was applied. The computed ANOVA statistic yielded a value of 1.073, which falls below the critical (F) value at a significance level of 0.05. Consequently, the research hypothesis is rejected. This implies that respondents, classified by the duration of their agricultural work, exhibit uniformity in their viewpoints concerning financial, institutional, and humanitarian risks.

Table 9. The categorization of respondents based on independent variables.

Variables	Frequency	%	Risks Mean	Std. Deviation	F	Sig.
Age						
19-38	153	54.6	76.76			
39-58	112	40.0	73.79	9.46	6.576	0.002
59-78	15	5.4	81.80			
Level of Education						
unlearned	24	8.6	79.37			
Primary education	118	42.1	75.33			
Intermediate	60	21.4	75.15	9.46	1.093	0.365
High School	21	7.5	75.19			
Diploma	24	8.6	74.83			
Bachelor	33	11.8	77.74			
Agricultural experience in the tomato field						
1-16	195	69.6	75.70			
17-33	73	26.1	75.57	9.46	1.073	0.343
34-50	12	4.3	79.75			
Size of farm holding/ Dunums						
1-8	197	70.4	75.83			
9-16	55	19.6	76.05	9.46	0.032	0.969
17-24	28	10.0	75.50			
Type of agricultural land tenure						
Ownership	138	49.3	74.11			
Agricultural contracts	73	26.1	79.68	9.46	7.438	0.000
Rent	33	11.8	72.87			
Participation	36	12.9	77.41			
Agricultural production volume during the year/ton						
1-24	166	59.3	74.00			
25-49	38	13.6	77.68	9.46	5.691	0.001
50-74	51	18.2	78.56			
75-99	25	8.9	79.76			
Number of times to contact the agricultural Extension Worker						
Once a week	30	10.7	67.06			
Once every two weeks	44	15.7	72.72	9.46	22.72	0.000
No contact	206	73.6	77.79			
Sources of agricultural information						
(13-23) Low	134	47.9	77.94			
(24-34) Medium	116	41.4	73.81	9.46	6.581	0.002
More than (34) High	30	10.7	74.33			
Participate in training courses in the field of tomato cultivation.						
Variables	Frequency	%	Risks Mean	Std. Deviation	t-test	Sig.
Participated	27	9.7	75.70			
Non-Participated	252	90.3	75.84	9.47	0.204	0.840

The findings revealed that the size of farm holdings varies between 1 and 24 dunums,

with an average of 6.66 dunums. Notably, the largest proportion, constituting 70.4% of

respondents, reported farm sizes ranging from 1 to 8 dunums, while the least represented group, at 10.0%, reported farm sizes between 17 and 24 dunums. To assess disparities in the mean levels of financial, institutional, and humanitarian risks experienced by respondents in relation to the size of their farm holdings, an analysis of variance (ANOVA) was employed. The computed ANOVA statistic yielded a value of 0.032, which is below the critical (F) value at a significance level of 0.05. Consequently, the research hypothesis is rejected. This implies that respondents, categorized by the size of their farm holdings, exhibit consistency in their perspectives concerning financial, institutional, and humanitarian risks, as illustrated in Table (9).

Table (9) demonstrates that the predominant proportion of respondents, comprising 49.3%, is categorized under the ownership status, with an average risk score of 74.11. In contrast, the lowest representation, at 11.8%, pertains to the rent category. To examine disparities in the mean levels of financial, institutional, and humanitarian risks encountered by respondents based on the type of farm tenure, an analysis of variance (ANOVA) was employed. The calculated ANOVA statistic yielded a value of 7.438, which exceeds the critical (F) value at a significance level of 0.01. Therefore, the research hypothesis is affirmed. This implies that farmers, contingent upon the type of farm tenure they hold, exhibit variations in their viewpoints concerning financial, institutional, and humanitarian risks.

The research findings indicate that the annual volume of tomato production ranges from 1 to 99 tons, with an average of 27.77 tons. Notably, the largest proportion, comprising 59.3% of respondents, reported production volumes falling between 1 and 24 tons, while the least represented group, at 8.9%, reported production volumes ranging from 75 to 99 tons. To assess variances in the mean levels of financial, institutional, and humanitarian risks experienced by respondents concerning their annual tomato production volume, an analysis of variance (ANOVA) was employed. The computed

ANOVA statistic yielded a value of 5.691, surpassing the critical (F) value at a significance level of 0.01. Consequently, the research hypothesis is affirmed. This implies that respondents exhibit variations in their perspectives concerning financial, institutional, and humanitarian risks, contingent upon the volume of tomato production they achieve during the year, as illustrated in Table (9).

Table (9) illustrates that the predominant proportion of respondents, constituting 73.6%, reported no interaction with agricultural extension workers, while the smallest representation, at 10.7%, indicated contact with agricultural extension workers occurring once a week. To assess disparities in the mean levels of financial, institutional, and humanitarian risks experienced by respondents based on their communication frequency with agricultural extension workers, an analysis of variance (ANOVA) was applied. The computed ANOVA statistic yielded a value of 22.72, exceeding the critical (F) value at a significance level of 0.01. Consequently, the research hypothesis is confirmed. This implies that there are variations in the perspectives of respondents concerning financial, institutional, and humanitarian risks, contingent upon their level of communication with agricultural extension workers.

The research findings indicate that the overwhelming majority, specifically 90.3% of respondents, do not engage in training courses, whereas a minority, constituting 9.7%, actively participate in such courses. To assess variances in the mean levels of financial, institutional, and humanitarian risks encountered by respondents based on their participation in training courses, the (t) test was used, and its value was (0.204), which falls below the critical (T) value at a significance level of 0.05. Therefore, the research hypothesis is rejected. This implies that respondents, categorized by their involvement in training courses, exhibit uniformity in their viewpoints concerning financial, institutional, and humanitarian risks, as illustrated in Table (9)

The research findings indicate that the highest numerical value representing

agricultural information sources is recorded at 44 degrees, while the lowest numerical value stands at 16 degrees. The mean value is calculated to be 11.25 degrees. The extent of exposure to information sources among the respondents was stratified into three distinct categories, as delineated in Table (9). The most significant proportion of respondents, comprising 47.9%, was categorized as belonging to the low category, while the least represented group, at 10.7%, fell within the high category. To assess disparities in the mean levels of financial, institutional, and humanitarian risks concerning information sources, an analysis of variance (ANOVA) was applied. The computed ANOVA statistic yielded a value of 6.581, exceeding the critical (F) value at a significance level of 0.01. Consequently, the research hypothesis is affirmed. This implies that farmers exhibit variations in their viewpoints concerning financial, institutional, and humanitarian risks, contingent upon their access to agricultural information sources.

Conclusions

1. The research results showed that the level of financial, institutional, and humanitarian risks facing respondents in Sulaymani Governorate is high and tends to be medium. From this, we conclude that the agricultural infrastructure in the governorate is weak, and the lack of skills for many farmers, as well as the difficulty of accessing financing, debt, and financial challenges, affects the profitability of farmers and the sustainability of their businesses.
2. The research results showed that the field of financial risks ranked first compared to other risks. We conclude from this that financial risks are related to price fluctuations and costs that directly affect the profitability and financial performance of farmers and high production costs can make it difficult for farmers to achieve sustainable profits.
3. The results of the research showed that the item (Instability in the economic and political situation in the country and its impact on tomato producers) ranked first among institutional risks. We conclude from this that the instability of the political and economic situation can lead to changes in government

policies related to agriculture. Such as changes in taxes, customs, or agricultural regulations that affect the cost of tomato production and the ability of farmers to export their products.

4. There is a discrepancy in farmers' opinions regarding the financial, institutional, and humanitarian risks facing respondents in Sulaymani Governorate with each of the following variables (age, type of farm holding, volume of tomato production during the year, contact with the agricultural extension worker, and sources of agricultural information). We conclude from this:

- Farmers with longevity are often more likely to make sound agricultural decisions based on many years of experience, and the agricultural knowledge gained can help reduce financial risks by making better decisions about when and how to plant tomatoes, Or they may be more inclined to invest in sustainable agricultural practices that reduce institutional risks.

- A large production volume can lead to challenges in marketing and distribution, as it becomes difficult to direct the crop to markets and ensure it remains fresh and ready for sale, or it can require more costs for labor, fertilizers, pesticides, and water. If these costs are not managed carefully, they can lead to increased financial risks.

- The type of farm holding can affect the laws and regulations that apply to farmers, as farmers who own large agricultural land or operate within large agricultural companies may have more financial resources and the ability to implement advanced agricultural practices and bear additional costs.

- A farmer who regularly interacts with an agricultural extension worker can benefit from advice on how to plan and manage his budget effectively, based on accurate information about production costs and price forecasts.

- Multiple sources of agricultural information help farmers build networks and relationships with other farmers, agricultural and governmental institutions, and these relationships can be useful if institutional support or collaboration with others is needed.

5. There is no discrepancy in farmers' opinions regarding the production and marketing risks facing tomato farmers in Sulaymaniyah governorates according to the research variables (educational level, agricultural experience, size of farm holding, participation in training courses), as a result of the high harmony between farmers of various categories in their awareness of these variables.

Recommendations And Suggestions

1. The need to diversify crops grown besides tomatoes, and can help reduce financial risks resulting from market price fluctuations and institutional risks associated with disease or unexpected weather conditions.
2. Preparing an integrated agricultural extension plan that includes estimates of production costs and forecasts for revenues, marketing and exports, which in turn reduces financial and institutional risks.
3. Providing occupational safety and health for workers on the farm and providing the necessary training to ensure that they work safely and effectively to reduce humanitarian risks.
4. Collaboration with agricultural extension workers can provide professional advice and guidance regarding farming practices and risk management.
5. Conduct other studies similar to this research on the latest agricultural practices, technology, and agricultural information to reduce financial, institutional, and humanitarian risks

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References

- [1] Platform for Agricultural Risk Management (2018). *Agricultural Risk Assessment and Management for Food Security in Developing Countries*, Rome.
- [2] Saleem A., Muhammad, Ghazanfar, A.K, (2013), Decisive analysis of risks in agriculture: implications for agricultural extension for sustainable management, *Spanish Journal of Rural Development*, Vol. IV (3): 41-52.
- [3] Hasan, T. M. L. (2021a), A suggested model for organizing the relationships among agricultural extension, research, and educational institutions in the Sulaymani governorate, *Basrah Journal of Agricultural Sciences*, 34(2), 161–183.
<https://doi.org/10.37077/25200860.2021.34.2.13>
- [4] Salem, Osama Abd Elhameed Fekry,(2008), An Economic Study Of Risk In Egyptian Agricultural Production, *Journal of Agricultural and Environmental Sciences*, Alexandria University - Issue (1), Volume (7), p 3.
- [5] Kahan, David (2013), Managing risk in farming, food and agriculture organization of the United Nations Rome.Pp 74-79.
- [6] Kalthory, D. A., Layeeq, T. M., & Sakinaa, M. O. (2022). The Role of Agricultural Extension to Facing Agricultural Risks in Sulaymani Governorate- Kurdistan Region - Iraq. *Diyala Agricultural Sciences Journal*, 14(1), 1–13.
<https://doi.org/10.52951/dasj.22140101>
- [7] El-Moghazy, W., H. M. Saleh., I. A. Saafan.,(2019).Activating the Role of Agricultural Extension in Agricultural Risk Management in Kafr El-Sheikh Governorate Assiut *J. Agric. Sci.*, 50 (1): (195-209)
Doi: 10.21608/ajas.2019.33518
https://ajas.journals.ekb.eg/article_33518_765a78cc044fe742d806c6377ae8ed32.pdf
- [8] Davis K, Terblanché S. (2016), Challenges facing the agricultural extension landscape in South Africa, Quo Vadis. *South African Journal of Agricultural Extension*, 44(2):231-247.
DOI: <http://dx.doi.org/10.17159/2413-3221/2016/v44n2a428>
- [9] Bezu D, Okoyo E, Hassen J. (2016), Factors influencing work motivation of development agents: The case of Agarfa and Sinana Districts, Bale Zone, Oromia Regional State, *Ethiopia. International Journal of Agricultural Science Research*, 5(1):1-18.
[http://academeresearchjournals.org/journal/ijasr/archiv_e/february-2016-vol.-5\(1\)](http://academeresearchjournals.org/journal/ijasr/archiv_e/february-2016-vol.-5(1))
- [10] Belay K, Alemu D. (2016), Agricultural research and extension linkages: challenges and intervention options. *Ethiopian Journal of Agricultural Sciences*, 27(1):55-76.
<https://www.ajol.info/index.php/ejas/article/view/150346/139922>
- [11] Das, P, Borua S.(2017), Constraints faced by agricultural technology management agency extension functionaries of Assam, India and their suggestions to overcome them. *Asian Journal of Agricultural Extension, Economics & Sociology*; 17(1):1-7.
DOI: 10.9734/AJAEES/2017/32995
- [12] Aderinto A, Agbelemoge A, Dada O. (2017), Effectiveness of extension service delivery and productivity of cassava farmers in Southwestern Nigeria. *The Journal of Agricultural Sciences*, 12(1):14-23.
<http://dx.doi.org/10.4038/jas.v12i1.8202>
- [13] Mansour, Tamer Gamal, Ibrahim Mahmoud Alaa Abdelaziz and Khairy Hamed Eleshmawiy,(2022), Challenges and Constraints Facing the Agricultural Extension System in Egypt, *The Journal of*

Agricultural Sciences - Sri Lanka, Vol. 17, No 2, Pp 241-257.

<http://doi.org/10.4038/jas.v17i2.9740>

[14] Hasan, Tahir. M. L, (2022), The causes of farmers' migration from the rural to the city and ways to address them from the point of view of agricultural extension workers in Sulaymani Governorate- Kurdistan Region – Iraq, *Tikrit Journal for Agricultural Sciences*, Volume 22, Issue 1, Pages 1-16.

<https://www.iasj.net/iasj/article/232538>

[15] Hasan, T. M. L. (2021b). Attitudes of Grain Farmers towards Selecting and Producing Certified Seeds and Their Relationship to Some Variables in Halabja Governorate. IOP Conference Series: *Earth and Environmental Science*, 761(1).

<https://doi.org/10.1088/1755-1315/761/1/012136>

[16] Wahib, Saad Malood and Sahab Ayid AL-jili, (2020), the knowledge level of tomato farmers with post-harvest techniques in Samarra district \ Salah – AL- Din province, Proceedings of the eighth and second international scientific conference of the College of Agriculture / University of Tikrit / 1-2 June Pp 1572-1583.

[17] Sharshar, A.Amin (2007), *Agricultural Extension Programs*, Dar Al-Nada for Printing and Publishing, Cairo.

[18] Ismail, H. S., 1995. *The Agricultural Marketing*, Mars Publishing House, Riyadh, Saudi Arabia, P 213

[19] Ognakossan, K. E., Jean, T., Peter. H., Kabirou. N., Ramasamy. S, (2022), Evaluation of Different Tomato (*Solanum lycopersicum* L.) Entries and Varieties for Performance and Adaptation in Mali, West Africa and Ramasamy Srinivasan, *Journal for Horticulture*, 8(7): 579

DOI: [10.3390/horticulturae8070579](https://doi.org/10.3390/horticulturae8070579)

[20] AOAD, Arab Organization for Agricultural Development, (2019), Yearbook of Arab Agricultural Statistics, Volume (38).

https://aoad.org/Arab_food_Security_Report_2019.pdf

[21] Ntonifor NN, Nsobinenyui DN, Fokam EB and LA Fontem,(2013), Developing an Integrated Management Approach for the Fruit Fly *Dacus punctatifrons* on Tomatoes. *American Journal of Experimental Agriculture*; **3**: 470-481.

[22] Mitra, S., S. Sharmin,(2019), Risk Attitudes and Financial Profitability of Tomato Farmers - A

Study in Bangladesh, *The Journal of Agricultural Sciences - Sri Lanka*, vol. 14, No. 3,. Pp 207-217.

<http://doi.org/10.4038/jas.v14i3.8604>

[23] Mutashar, Z. J., B. H. Majeed (2016), Effect of Some Organic and Mineral Nutrients in the Qualities Quality of Fruits Tomato, *Iraqi Agriculture Research Journal (Special Issue)* 22(9):75-87

<https://iasj.net/iasj/download/cb1a2d9f54eefee6>

[24] Willcox, J.K.; Catignani, G.L.; Lazarus, S. (2003), Tomatoes and cardiovascular health. *Crit. Rev. Food Sci. Nutr*, 43, 1–18

DOI: [10.1080/10408690390826437](https://doi.org/10.1080/10408690390826437)

[25] Al-Shadiadeh A.N., Al-Mohammady F.M., Abu-Zahrah T.R. (2012). Factors influencing adoption of protected tomato farming practices among farmers in Jordan Valley. *World Applied Sciences Journal*, 17 (5), 572–578.

[26] Masunga A.W. (2014). *Assessment of Socio-Economic and Institutional Factors Influencing Tomato Productivity Amongst Smallholder Farmers: A Case Study of Musoma Municipality, Tanzania*. Master's Thesis. Morogoro: Sokoine University of Agriculture.

[27] Usman I., Taiwo A.B, Haratu D., Abubakar M.A. (2013). Socio-economic factors affecting groundnut production in Sabon Gari Local Government of Kaduna State, Nigeria. *International Journal of Food and Agricultural Economics*, 1 (1), 41–48. DOI: 10.22004/ag.econ.156141.

[28] Altarawneh M., Altahat E., Al-Sharafat A. (2012). Evaluation of vegetable farmers' participation in agricultural extension activities. *American Journal of Agricultural and Biological Sciences*, 7 (2), 201–206. DOI:10.3844/ajabssp.2012.201.206

[29] AL-Abbassi, A.F. Khalil., (2018), *Methods of Scientific Research and Statistical Analyses in Behavioral Sciences*, Noon House for Printing, Publishing and Distribution, University of Mosul-Iraq, p 187.

[30] Melhem, S. M, (2010), *Research Methods in Education and Psychology*, Sixth Edition, Dar Al-Masirah for Publishing and Distribution, Amman, Jordan.

<http://www.s-ajfan.com/vb/showthread.php?t=195756>



المخاطر المالية والمؤسسية والبشرية وتأثيرها على زراعة الطماطم في محافظة السليمانية

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الملخص

استهدف البحث التعرف على مستوى المخاطر المالية والمؤسسية والانسانية التي تواجه مزارعي الطماطم في محافظة السليمانية ، فضلاً عن تحديد التباين في آراء الزراع نحوها وفق متغيرات البحث، وقد تم جمع البيانات باستخدام استبيان و بطريقة المقابلة الشخصية بأخذ عينة عشوائية متعددة المراحل باختيار ثلاث مناطق مشهورة بزراعة الطماطم في محافظة السليمانية، بواقع (1750) مزارعاً ثم في مرحلة الثانية أخذت عينة عشوائية طبقية تناسبية بنسبة (16%) من مجتمع البحث فكان حجم العينة بمقدار (280) مزارعاً، وقد ظهرت نتائج البحث إن مستوى المخاطر المالية والمؤسسية والانسانية التي تواجه مزارعي الطماطم في محافظة السليمانية عالي يميل إلى متوسط، وبينت نتائج البحث أنه يوجد تباين في آراء المزارعين نحو المخاطر المالية والمؤسسية والانسانية التي تواجه مزارعي الطماطم في محافظة السليمانية وفق متغيرات البحث (العمر، نوع الحيازة المزرعية ، حجم الانتاج الطماطم خلال السنة ، اتصال مع المرشد الزراعي، مصادر المعلومات الزراعية) في حين لا يوجد التباين في آراء المزارعين نحو المخاطر المالية والمؤسسية والانسانية وفق متغيرات البحث (مستوى التعليمي ،سنوات الخبرة الزراعية، حجم الحيازة المزرعية، مشاركة في دورات التدريبية)، لذا يوصى الباحثان بتنوع المحاصيل المزروعة إلى جانب الطماطم واعداد خطة زراعية إرشادية متكاملة و توفير السلامة والصحة المهنية للعمال في المزرعة لتقليل المخاطر المالية والمؤسسية والانسانية في إنتاج الطماطم.

الكلمات المفتاحية : المخاطر ، المخاطر المالية، المخاطر المؤسسية، المخاطر البشرية، محصول الطماطم.