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The Risks of Agricultural Work Facing Growers in Tattai Village in Gharbia Governorate: (Social Study)

Engy Khairy Faied* and Amany Said Elkholy
Agricultural Extension & Rural Development Research Institute (AERDRI), Agricultural Research Center, Cairo, Egypt.
* email: engyfaied@arc.sci.eg

Abstract: This research attempts to identify the respondents' experiences with the circumstances of working in their small farms by archiving the main objective: Identifying the risks in the agricultural work facing growers in Tattai Village in Gharbia Governorate. This main objective was achieved by investigating a number of related sub-objectives covering some types of agricultural work risks growers face, including identifying the respondents' opinions on the risks they face in their small farms. In addition, the study aims to identify the respondents' opinions on the authorities concerned with the risks of agricultural work, as well as the respondents' suggestions for facing agricultural work risks. Finally, this study aims to determine the respondents' opinions on the country's efforts to address agricultural work risks. This study was conducted on a random sample of 97 growers in Tattai Village, Gharbia governorate; data were collected using a pretested questionnaire via a personal interview during September 2021. Data were analyzed and expressed using Frequencies, percentages, means, standard deviation. The main findings revealed that the respondents were moderately affected by various risks, including environmental, economic, social, and health risks. These findings demonstrate the critical need for a strategy to manage risks in small farms. In contrast, the results indicate that the state made efforts to address the risks of agricultural work and activate the role of various institutions to reduce the severity of the risks in agricultural work small farmers face, such as the decent life initiative (Hayah Karima).

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1. Introduction

Small farms play a vital role in the sustainable development of rural areas. However, the data indicate that their numbers have been gradually declining. This decline can be attributed to the low profitability of production, combined with the uncertainty created by the high risk of agricultural production. In this context, it is crucial to create an appropriate risk management strategy to maintain a stable income and continue agricultural production. The results of the analysis indicate that the level of risk management in the studied group is very low. A positive correlation was found between the number of the management tools used and the level of manager's education, the size of the agricultural area, the level of estimated income, and the share of goods sold on the market (Stepien and Polcyn, 2019). Risks in the agricultural sector have multiple dimensions or factors, and prioritizing these can support decision-making. On the contrary, interpreting the significance of these risk factors for distinct agricultural activities and how they vary according to the geographic zone is essential relevant information for agricultural development (Toledo et al., 2011).

The most common sources of risks in farming can be divided into five areas: production and technical risk, marketing, financial, institutional, human (Kahan, 2013). The fatal accidents and injuries of farmers are more in India than in other farming countries. Furthermore, it was caused by the lack of awareness of the safety issues and proper machinery operation procedures. Agricultural education is the main factor because farmers in India use traditional farming and lack knowledge of the proper machinery operation procedures. Therefore, if they receive adequate training, the farming workplace accidents should be reduced (Kumar et al., 2017).

Production risks are related to economic, political, and personal risks. The country's political situation and various regulations pose economic risks. Credit risks are associated with regulation that is a component of the political risk and the country's general economic situation. Therefore, it is difficult to separate different types of risks in an attempt to analyze agriculture risks and evaluate or manage them

because risks affect each other and interact (Girdžiūtė, 2012). Environmental degradation, climate change, and limited agricultural technology significantly impact older farmers more than their younger, healthier, and better-educated counterparts. Discrimination against older rural people in accessing credit, training, and other income-generating resources may exacerbate the disadvantages faced by older farmers (FAO, 2017).

Agriculture is a significant component of the Egyptian economy, contributing 11.3% of the country's gross domestic product. The agricultural sector accounts for 28% of all jobs, and over 55% of employment in Upper Egypt is agriculture-related. Egypt's agriculture sector is dominated by small farms using traditional practices that do not meet international standards (USAID, 2020).

In 2010, Egypt's total agricultural area was approximately 3.7 million hectares. The most common productivity problems in Egypt were found to be: increase in the prices of chemical fertilizers of all kinds and the increase in the rental value of agricultural lands; the most common marketing problems were low selling price of the crop during harvest due to the abundance of supply, and the absence of the role of extension in marketing the crop. In other words, It appears that a lack of proper management and farming practices and irrational policies have been behind this degree of risk in agricultural production (Soliman et al., 2013). In addition, problems (El-Ramady et al., 2013) identify climate change as an environmental problem that has the potential to affect agriculture through changes in temperature, rainfall timing and quantity, CO 2, and solar radiation. Nevertheless, (Nin-Pratt et al., 2018) mentioned that (smallholder) households with diversified production systems of field and high value seem to be the most resilient.

El-Enbaby et al. (2019) characterizes smallholder farm households in Upper Egypt and focuses on nutrition as a health risk is underlined by relatively high undernutrition and overnutrition rates among the surveyed farm households. Almost 18% of children under five years of age are stunted, and nearly 25% of them are at risk of being overweight. Agricultural interventions can impact nutrition through six main pathways, which are: 1) providing direct access to food from own production; 2) providing a source of income from which food and other nutrition needs can be met; 3) affecting food prices; 4) affecting women's social status and empowerment; 5) affecting women's time use from participation in agricultural work, and 6) affecting women's health and nutrition from engagement in agricultural activities.

Smallholders in Egypt must organize themselves into farmer associations as a prerequisite for contract farming because they are more likely to obtain a beneficial arrangement than individual smallholders working alone. The advantages of membership in a farmer association that contracts with exporters include market information, standard compliance, advisory services, technical information, upgrading and competitiveness, and credit (Kristensenet al., 2009).

Concerning Egyptian government efforts towards reducing agricultural risks, the government accelerated The Hayah Karima Initiative, initially launched in 2019, and had an initial budget of EGP 675 million (~USD 43 million) to accelerate poverty eradication at a local level, with 18 civil society organizations targeting rural villages with poverty rates over 70% as its first phase. The initiative focuses on the effective eradication of poverty by providing health, educational, and housing support, in addition to supporting microenterprises and economic empowerment. The initiative was endorsed as a presidential initiative in 2021 with a much bigger budget of EGP 500 billion (~USD 31.8 billion) for its second phase. Hayah Karima also places a strong emphasis on local infrastructure, improving the quality of housing through ensuring access to electricity, water, sanitation, and gas. Beneficiaries of the initiatives have reached 186 thousand individuals so far (MPED, 2021).

The capacity-building approach is critical for rural development in general and for dealing with agricultural work risks, particularly small farms. Farmers will be better prepared to face agricultural work risks due to this approach, which includes technical training, cooperation, teamwork, and marketing. Implementing this approach will necessitate additional efforts from various sources, including international institutions, national institutions & NGOS.

The problem of the research

It is fundamental to assess the agricultural working by conducting an opinion survey to maximize its benefits and mitigate risks. Nonetheless, small farms play a vital role in the sustainable development of rural areas. According to the data, their number has been steadily decreasing. This reduction is the uncertainty induced by the high risk in the small farms. It is crucial to identify the risks in agricultural working facing growers and create an appropriate risk management strategy in this context. What agricultural risks do growers in Tattai Village, Gharbia Governorate, face? This central question was presented as the main problem of the research, which can be solved by answering the following research questions:

1) What are the respondents' perspectives on the environmental, economic, social, and health risks facing them?
2) What are the respondents' opinions regarding the authorities concerned with the risks of agricultural working?
3) What are the respondents' recommendations for facing agricultural work risks?
4) What are the respondents' opinions regarding the country's efforts to face these risks?

Objectives

This study aims to identify the respondents' perceptions and experiences with the circumstances of working in their small farms by archiving the main objective, which is identifying the risks in the agricultural work facing growers in Tattai Village in Gharbia Governorate. This main objective was achieved through investigating a number of related sub-objectives covering some dimensions of the risks agricultural work facing growers, including:

1) Identifying the respondents' opinions on the risks facing them in their small farms.
2) Identifying the respondents' the respondents' points of view about the authorities concerned with facing the risks of agricultural work.
3) Identifying the respondents' suggestions for facing agricultural work risks.
4) Identify the respondents' opinions on the country's efforts to face agricultural work risks.

2. Methodology

Operational definitions

Growers: They are farmers with limited land ownership (less than Fadden) or paying rent to the landowner.

Degree of risks: This is a plethora of risks that growers are faced and linked to specific stages in the agricultural value chain (e.g., the input risk during the planting and growth stage of the crops). The most common sources of risk in farming can be divided into Four areas: environmental, economic, social risks & health risks. The sum of respondents' degrees for each type of risk represents the degree of risks variable.

Environmental risks: This variable is defined as the total rating responses for eight types of risks, including climate change, torrents, pests, insects, lack of water, canal blockage, filter blockage, and seeds spoilage.

The responses were assigned to (high, medium, low) for each risk, and the scores were assigned as 3, 2, and 1.

Economic risks: This variable is defined as the sum of the ratings responses for ten types of risks, including the inability to cultivate the land, inability to provide agricultural labor, inability to repay the debts of the Agricultural Bank, inability to market the product, inability to purchase production supplies, inability to obtain production requirements from the cooperative, inability to pay the rent for the land, inability to pay the installments of the land, low productivity of the land & inability to rent agricultural equipment.

For each type of risk, the responses were assigned to (high, medium, low), and the scores were assigned as 3, 2, and 1.

Social risks: This variable is defined as the sum of the rating responses for six types of risks: conflict with neighbors on the land's borders, conflict over-irrigation shifts, conflict due to some people's failure to repair the irrigation machine, disintegration of social relations between parents and neighbors, decreased degree of belonging to the local community, and the spread of individualism.

For each type of risk, the responses were assigned to (high, medium, low), and the scores were assigned as 3, 2, and 1.

Health risks: This variable was defined as the sum of the rating responses for 14 types of risks, including Colds and flu, gastroenteritis, cancer, kidney failure, skin diseases, respiratory diseases, falls, wounds, bird flu virus, disease from animal to human, sunstroke, eye diseases, as well as scorpion and snake bites.

For each type of risk, the responses were assigned to (high, medium, low), and the scores were assigned as 3, 2, and 1.

Age: This variable was defined as the respondent's age in years.

Education: The number of years respondents have succeeded in their school.

Family size: The total number of people in the household.

Landholding size: The land area (parcel) used entirely for the plant, regardless of carat size.

Annual income (1000 EGP): The total annual income in (1000 EGP).

The research is descriptive research, in which the data gathered through questionnaires, interviews, and observation were analyzed using qualitative and quantitative tools. A sample survey was designed and administered on a sample of peasants who hold less than one Fadden registered in (2 farm holdings record).

Data were collected from a random sample of 2,597 growers drawn from populations, and the random sample was drawn using the (Al-Sayyad and Mustafa, 1990) equation:

$$n = \frac{N}{(N-1) \times B^2 + 1}$$

Where: n = Required Sample size, N =Population Size, B2 =0.01

The sample size was 97 respondents in Tattai village, which is part of the Agricultural Research Center's research area in Gharbia Governorate. Data were collected using a pretested questionnaire through a personal interview during September 2021. Percentages and frequencies, as well as mean and standard deviation, were used for data analysis.

3. Results

Characteristics of the Respondents

Table 1 displays summary statistics for the characteristics of the sample, including the age of respondents; the actual range for this variable was from 27 to 75 years old with a mean of 51.26 years old and a standard deviation of 1.32. With regard to the number of education years for respondents, the actual range for this variable ranged from 0 to 16 years, with a mean of 12.42 years and a standard deviation of 4.17. Concerning family size, the actual range for this variable was from 1 to 6 members with a mean of 3 members and a standard deviation of 1.68. For the size of landholding for respondents, the actual range for this variable was 2 carats to 24 carats, with a mean of 6.29 carats and a standard deviation of 4.08. With respect to the annual income (1000 EGP), the actual range for this variable was from 36 to 120 (1000 EGP), with a mean of 67.06 (1000 EGP) and a standard deviation of 2.26.

Table 1: Descriptive statistics analysis of the respondents' characteristics

Characteristics of the Respondents	Actual range		Mean	Std. Deviation
	Minimum	Maximum		
Age	27	75	51.26	1.32
Education	0	16	12.42	4.17
Family size	1	6	3	1.68
Landholding size	2	24	6.29	4.08
Annual income (1000 EGP)	36	120	67.06	2.26

The results of the statistical analysis of the study data

The actual range of the studied variables described sample measures was used to construct three categories as shown in Table 2. In terms of age, it was found that (1) low rating that ranged from 27 to less than 44 years old, 2) the medium rating category that ranged from 44 to less than 61 years old, 3) and the high rating category that ranged from 61 to 75 years old. The respondents were assigned to the three categories according to their responses, as shown in Table (2). It was found that more than half, 55.7% of respondents were in the medium rating category, 33% were in the low rating category, and 11.3% of the total respondents were in the high rating category.

With respect to the number of education years, as displayed in Table 2, it was found that (1) low rating ranges from 0 to less than six years, 2) medium rating category ranges from 6 to less than 13 years, 3) and the high rating category that ranges from 13 to 16 years. The respondents were assigned to the three categories based on their responses, see Table 2. It was found that 45.4 % of respondents are in the medium rating category, 42.2% are in the high rating category, while 12.4% of the total respondents are in the low rating category.

Table 2: Distribution of the Respondents' characteristics according to the responses rating categories

Characteristics of the Respondents	Rating Categories								
	Low			Medium			High		
	Category	Frequency	%	Category	Frequency	%	Category	Frequency	%
Age	27 -	32	33	44 -	54	55.7	61 - 75	11	11.3
Number of education years	0 -	12	12.4	6 -	44	45.4	13 - 16	41	42.2
Family size	1 -	34	35	3 -	35	36.1	5 -6	28	28.9
Size of landholding	2 -	77	79.4	10 -	17	17.5	17 - 24	3	3.1
Annual income (1000 EGP)	36 -	32	33	65 -	43	44.3	93 -120	22	22.7

The results of the statistical analysis of the study data

With regard to the family size, as depicted in Table 2, it was found that (1) low rating ranges from 1 to 2 members, 2) the medium rating category ranges from 3 to 4 members, 3) and a high rating category that ranged from 5 to 6 members. The respondents were assigned to the three categories according to their responses, as shown in Table 2. It was found that 36.1% of respondents are in the medium rating category, 35% are in the low rating category, and 28.9% are in the high rating category.

Regarding the size of landholding, as shown in Table 2, it was found that (1) low rating that ranged from 2 to less than 10 carats, 2) a medium rating category that ranged from 10 to less than 17 carats, 3) and a high rating category that ranged from 17 to 24 carats. The respondents were divided into three categories, see Table 2. It was found that most of them, 79.4% are in the low rating category, 17.5% are in the medium rating category, and 3.1% of the total respondents are in the high rating category.

In relation to the annual income (1000 EGP), Table 2 demonstrates that: (1) low rating is ranged from 36 to less than 65 (1000 EGP), 2), the medium rating category ranging from 65 to less than 93(1000 EGP), 3), whereas the high rating category ranging from 93 to 120 (1000 EGP). According to their responses, the respondents were assigned to the three categories, as shown in Table 2. It was found that 44.3% of respondents are in the medium rating category, 33% are in the low rating category, and 22.7% of the total respondents are in the high rating category.

(1) Respondents' opinions about the environmental risks facing them

According to Table 3, the theoretical range for this variable is 8 to 24 degrees, while the actual range is between 11 to 22 degrees, with a mean of 16.2 degrees and a standard deviation of 2.35. The theoretical range of the measures of the studied variable was used to make three categories, 1) a low rating category that ranged from 8 degrees to less than 13 degrees, 2) a medium rating category that ranged from 13 degrees to less than 19 degrees, and 3) a high rating category that ranged from 19 degrees to 24 degrees. Based on their responses, the growers were assigned to three categories, as shown in Table 4. It was found that 78.3% are in the medium rating category, while the high rating category represents only 15.5% of the total respondents. The proportion of respondents in the low rating category did not exceed 6.2 % of the total respondents, which means respondents are moderately affected by climate change, torrents, pests, insects, lack of water, canal blockage, filter blockage & seed spoilage.

Table 3: Descriptive statistics analysis of respondents' opinions on the risks facing them according to the response degrees

Agricultural work risks	Theoretical range		Actual range		Mean	Std. Deviation
	Minimum	Maximum	Minimum	Maximum		
Environmental risks	8	24	11	22	16.2	2.35
Economic risks	10	30	10	30	18.13	3.76
Social risks	6	18	6	18	11.36	2.57
Health risks	11	33	14	33	23.03	4.47
Total risks	35	105	52	103	68.73	9.34

The results of the statistical analysis of the study data

(2) Respondents' opinions on the economic risks facing them

The results depicted in Table 3 demonstrate that this variable ranges from 10 to 30 degrees, with a mean of 18.13 degrees and a standard deviation of 3.76. The theoretical range of the measures of the studied variable was used to make three categories, 1) a low rating category that ranges from10 degrees to less than 17 degrees, 2) a medium rating category that ranges from 17 degrees to less than 24 degrees, and 3) a high rating category that ranges from 24 degrees to 30 degrees. The growers were assigned to the three categories according to their responses, as demonstrated in Table 4. It was found that 50.5% of respondents are in the medium rating category; the low rating category represented 42.3% of the total respondents, while the proportion of respondents in the high rating category did not exceed 7.2% of the total respondents. This means that respondents were unable to cultivate the land, provide agricultural labor, repay the Agricultural Bank's debts, market the product, purchase production supplies, obtain production requirements from the cooperative, pay the rent for the land, pay the installments of the land, have low land productivity, and were unable to rent modern agricultural equipment.

(3) Respondents' opinions regarding the social risks facing them

The results in Table 3 show that this variable ranged from 6 degrees to 18 degrees, with a mean of 11.36 degrees and a standard deviation of 2.57. The theoretical range of the measures of the studied

variable was used to make three categories, 1) a low rating category that ranged from 6 degrees to less than 10 degrees, 2) a medium rating category that ranged from 10 degrees to less than 15 degrees, and 3) a high rating category that ranged from 15 degrees to 18 degrees. Table 4 depicts that the growers were assigned to the three categories according to their responses. It was found that 55.7% of respondents are in the medium rating category, while the low rating category represented 33% of the total respondents, and the high rating category, respondents 11.3% of the total respondents, which means that respondents suffered to a moderate extent from a struggle with neighbors on the borders of the land, struggle over-irrigation shifts, conflict due to some people's failure to repair the irrigation machine, disintegration of social relations between families and neighbors, decreased degree of belonging to the local community and individualism spreading.

Table 4: Distribution of the respondents' opinions regarding the risks they face according to the responses rating categories

Risks facing Growers	Rating Categories								
	Low			Medium			High		
	Category	Frequency	%	Category	Frequency	%	Category	Frequency	%
Environmental risks	8 -	6	6.2	13 -	76	78.3	19 - 24	15	15.5
Economic risks	10 -	41	42.3	17 -	49	50.5	24 - 30	7	7.2
Social risks	6 -	32	33	10 -	54	55.7	15 - 18	11	11.3
Health risks	14 -	13	13.4	20 -	68	70.1	27 -33	16	16.5
Total risks	35 -	10	10.3	59 -	77	79.4	82 -105	10	10.3

The results of the statistical analysis of the study data

(4) Respondents' opinions on the health risks facing them

According to Table 3, the theoretical range for this variable was 11 to 33 degrees, while the actual range was 14 degrees to 33 degrees, with a mean of 23.03 degrees and a standard deviation of 4.47. The theoretical range of the measures of the studied variable was used to make three categories, 1) a low rating category that ranged from 14 degrees to less than 20 degrees, 2) a medium rating category that ranged from 20 degrees to less than 27 degrees, and 3) a high rating category that ranged from 27 degrees to 33 degrees. According to their responses, the growers were distributed on the three categories, see Table 4. It was found that 70.1% of respondents are in the medium rating category, while the high rating category represented 16.5% of the total respondents, and the low rating category represented 13.4% of the total respondents. This means respondents moderately suffered from cold and flu, gastroenteritis, cancer, kidney failure, skin diseases, respiratory diseases, falls, wounds, bird flu virus, disease from animal to human, sunstroke, eye diseases & scorpion, and snake bites, indicating the respondents' need for good health insurance.

(5) Respondents' opinions on the total risks they face

Table 3 shows that this variable's theoretical range ranged from 35 to 105 degrees, while the actual range falls between a minimum of 52 degrees to a maximum of 103 degrees, with a mean of 68.73 degrees and a standard deviation of 9.34. The theoretical range of the measures of the studied variable was used to make three categories, 1) a low rating category that ranged from 35 degrees to less than 59 degrees, 2) a medium rating category that ranged from 59 degrees to less than 82 degrees, and 3) a high rating category that ranged from 82 degrees to 105 degrees. The growers were assigned to the three categories according to their responses, as shown in Table 4. It was found that 79.4 % of respondents are in the medium rating category, while the low rating category and the high rating category represented 10.3% of the total respondents in each category separately, which means respondents suffered moderately from a range of environmental, economic, social & health risks, indicating the critical need for a strategy to manage risks in small farms.

6) Respondents' opinions on the authorities concerned with the risks of agricultural work

According to Table 5, 60.1%, 55.7%, 45.4%, 45.1%, 24.4%, 17.5%, 16.5%, and 11.3%, of the respondents have selected the ministry of agriculture and land reclamation (MALR), Central Administration of Agricultural Extension Service (CAAES), Agricultural research center (ARC), Ministry of water resources & irrigation (MWRI), Ministry of local development (MOLD), Desert

research center (DRC), National research center (NRC), Insurance companies (IC) with a high degree as a defender against agricultural work risk, respectively. These findings indicate a need to enhance the role of institutions in addressing agricultural risks.

7) Respondents' suggestions for facing agricultural work risks

According to Table 6, 80.4%, 78.4%, 59.8%, 55.7%, 51.5%, 50.5%, 46.4%, and 27.8% of the respondents have suggested Supporting agricultural production supplies, Providing agricultural extension services, Issuing a law for agricultural labor risks, Activating the law of the Contractual Agriculture, Agricultural work risk insurance, Establishing an administration for the agricultural work risks, Encouraging the creation of links and facilitate their configuration procedures as a defender against agricultural work risk, respectively. The data indicate that the supporting of agricultural production supplies & providing agricultural extension services represent the primary solution to face agricultural risks in small farms.

Table 5: Distribution of the respondents' opinions on the authorities concerned with the risks of agricultural work

Competent Institutions	Rating Categories					
	Low		Medium		High	
	Frequency	%	Frequency	%	Frequency	%
MALR	5	5.2	32	33	60	60.1
CAAES	0	0	43	44.3	54	55.7
ARC	3	3.1	50	51.5	44	45.4
MWRI	3	3.1	50	51.5	44	45.1
MOLD	23	23.7	50	51.5	24	24.4
NRC	49	50.5	31	32	17	17.5
DRC	57	58.8	24	24.7	16	16.5
IC	35	36.1	51	52.6	11	11.3

The results of the statistical analysis of the study data

(8) Respondents' opinions on the country's efforts for facing agricultural work risks

With reference to Table 7, 75.3%, 74.2%, 69.1%, 62.9%, 59.8%, 59.8%, 57.7%, 54.6%, 48.5% of the respondents have selected the elimination of Hepatitis C, 100 million healthy lives initiative, Women's Health Initiative, developing the field irrigation, Lining the canals and drains, medical convoys and free treatment, Egyptian Rural Development Projects & A decent life initiative, Solidarity and Dignity Initiative as the state's efforts to confront the risks of agricultural work.

Table 6: Distribution of the respondents' suggestions for facing agricultural work risks

Suggested for facing agricultural work risks	Frequency	%
Supporting of agricultural production supplies	78	80.4
Providing agricultural extension services	76	78.4
Issuing a law for agricultural labor risks	58	59.8
Activating the law of the Contractual Agriculture	54	55.7
Establishing a fund to address the risks of agricultural work	50	51.5
Agricultural work risk insurance	49	50.5
Establishing an administration for the agricultural work risks	45	46.4
Encouraging the creation of links and facilitating their configuration procedures	27	27.8

The results of the statistical analysis of the study data

Table 7: Distribution of the respondents' opinions on the country's efforts for facing agricultural work risks

Country's efforts for facing agricultural work risks	Frequency	%
Elimination of Hepatitis C	73	75.3
100 million healthy lives initiative	72	74.2
Women's Health Initiative	67	69.1
Developing the field irrigation	61	62.9
Lining the canals and drains	58	59.8
Medical convoys and free treatment	58	59.8
Egyptian Rural Development Projects	56	57.7
A decent life initiative	53	54.6
Solidarity and Dignity Initiative	47	48.5

Results of the statistical analysis of the study data

4. Discussion

The analysis results indicate that the respondents' characteristics concentrated in the medium and low rating categories, indicating their need for more help to face and manage agricultural risks. Respondents were moderately affected by various environmental, economic, social, and health risks, highlighting the critical need for a risk management strategy in small farms. On the contrary, the results indicate that the state had efforts to deal with the risks of agricultural work and activate the role of various institutions to reduce the severity of the risks in agricultural work facing small farmers like a decent life initiative.

Conclusions

Based on the previous findings, the following recommendations could be developed:

1. Based on the results, 78.3% of the respondents were exposed to environmental risks, 50.5% were exposed to economic risks, 55.7% were exposed to social risks, and 70.1% were exposed to moderate health risks, which shows the seriousness of the environmental, economic, social and health situation to work in agricultural production, which necessitates the rapid adoption of a legal framework to include agricultural production workers among the categories benefiting from the Labor Law's protection, through the implementation of social protection mechanisms for improving the social status and upgrading the economic and health aspects of agricultural production workers, by establishing a minimum wage, implementing health insurance for them, decent pensions, and satisfactory compensation for job-related injuries.
2. It is necessary to conduct medical convoys in the countryside and agricultural fields during planting and harvesting seasons to meet the most significant possible number of agricultural production workers to help them overcome the risks they face.
3. Working on diversifying the sources of income for agricultural production workers by offering training programs in agriculture, craftsmanship, and food manufacturing to increase their income, which would reduce some of the economic risks they face.
4. Establish a crisis management unit in each village's agricultural cooperative or extension centers to monitor and respond to agricultural risks.
5. Activating the role of agricultural extension to raise awareness about the types of agricultural risks that small farmers may face, how to avoid their occurrence, and how to deal with them if they occur.
6. Enhancing positive behaviors and countering negative behaviors related to occupational safety and health in agriculture through a legal and social framework by enacting laws to protect waterways and agricultural lands and activating the role of religious institutions and civil society institutions in spreading awareness of preserving the environment.

Availability of data materials

Data were collected using a pretested questionnaire through a personal interview during September 2021.

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Author's contribution

Dr.A. S. Elkholy prepared the questionnaire, collected, analyzed, and interpreted the respondents' data; Dr. E. K. Faied prepared the study to formulate the idea, set goals, and write the results and contributed to writing the discussion and conclusions. All authors read and approved the final manuscript.

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