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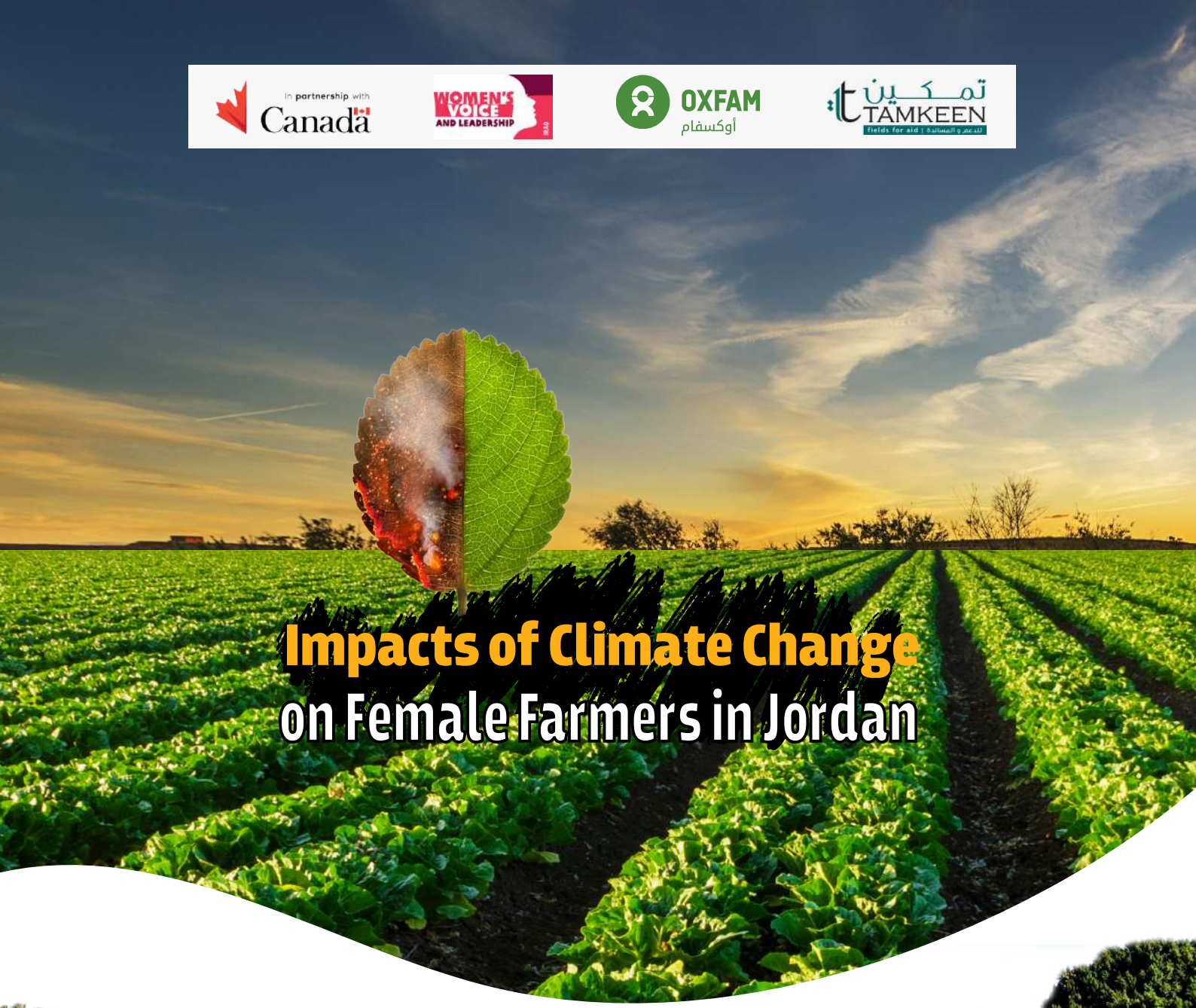

Impacts of Climate Change on Female Farmers in Jordan

Contents

List of Tables

List of Figures

Chapter One: Theoretical Framework and Study Importance

Executive Summary

The aim of this study is to explore the impact of climate change on female workers in agriculture in Jordan, particularly in the most affected areas such as the Jordan Valley. The study seeks to understand the social and psychological effects that they may face as a result of these changes and to propose strategies for helping them adapt to these changes. This study is an exploratory research that utilized both quantitative and qualitative survey methods. It employed observation tools and six focus group discussions with 25 participants. Additionally, a questionnaire was used and applied to a convenient sample of 566 participants from the study population, which consists of female workers in the agricultural sector in the Jordan Valley.

The study reached several key findings, the most important of which are that 65.1% of female workers in the agricultural sector had never heard of the concept of climate change, and 61.9% of them rely on practical experience to obtain information about it. The results revealed that the most noticeable signs of climate change observed by female workers in agriculture are increased temperatures and decreased rainfall. The study furthermore indicated that climate change has significantly led to a decrease in crop production by 88.7%. It also showed a lack of awareness among female workers about the effects of climate change in many agricultural areas, with rising temperatures and droughts contributing to a decline in production and agricultural revenues. Another significant effect of climate change is the emergence of agricultural pests and diseases, accompanied by increased operational costs. The study also highlighted that the primary challenges affecting agricultural production are water shortages. In terms of economic impacts, female workers are suffering from reduced revenues and increased financial burdens. Socially, the results revealed social pressures, discrimination against female agricultural workers, and the absence of legal protection and decent labor rights. Additionally, they face multiple health risks due to working in harsh climatic conditions and exposure to chemicals, with a lack of occupational safety measures. These findings underscore the urgent need for greater support for female workers in the agricultural sector in terms of awareness, government support, and improving economic, health, and legal conditions.

Keywords: female agricultural workers, female farmers, climate change, weather, Jordan, Jordan Valley.

Introduction

Climate change is a global phenomenon increasingly impacting various aspects of human and environmental life. Climate change is characterized by long-term shifts in temperatures and weather patterns, often attributed to human activities such as greenhouse gas emissions from burning fossil fuels, deforestation, and land-use changes. This phenomenon goes beyond being merely an environmental issue; it has become a direct threat to sustainable development, global food security, public health, and social stability[1].

The agricultural sector is the most vulnerable to the impacts of climate change due to its heavy reliance on stable climatic conditions to ensure productivity and sustainability. These impacts are evident in increasing droughts, rising temperatures, changing rainfall patterns, and soil degradation. As a result, farmers face reduced agricultural productivity and increased costs, affecting their food security and economic stability.[2]

Furthermore, the Middle East is regarded as one of the world's driest and most climate-sensitive regions, where agricultural challenges are especially evident. Jordan, with its limited natural resources and reliance on agriculture as a primary source of food and employment, is among the most affected countries. The Jordan Valley it's Janoobiyah (north) and Shamaliyah (south) districts as well as the mid; is a vital example of these challenges, known for producing essential crops that support national food security. However, this region faces increasing challenges due to climate change, such as declining groundwater levels and altered rainfall cycles, negatively affecting agricultural patterns and working conditions.[3]

Women agricultural workers are among the most affected by these changes, forming a significant portion of Jordan's agricultural workforce and relying heavily on this sector for income and livelihood. Climate change adds extra burdens that go beyond professional impacts, extending to economic, psychological, and social aspects. For instance, reduced agricultural productivity leads to decreased income for women workers and increased dependence on limited financial resources. Additionally, these challenges cause psychological stress due to economic instability and fears of losing livelihoods, affecting social relationships within agricultural communities.[4]

1 Intergovernmental Panel on Climate Change (IPCC). (2022). Climate change 2022: Impacts, adaptation, and vulnerability. Retrieved from https://www.ipcc.ch/report/ar6/wg2/

2 Food and Agriculture Organization (FAO). (2021). Climate change and agriculture: Challenges and opportunities. Retrieved from: https://www.fao.org/3/i9335en/i9335en.pdf

3 Ministry of Environment Jordan. (2022). National adaptation plan for climate change. Retrieved from: https://www.moenv.gov.jo/ebv4.0/root_storage/en/eb_list_page/national_adaptation_plan.pdf

4 World Bank. (2023). Climate resilience in agriculture: A gender perspective. Retrieved from https://www.worldbank.org/en/topic/climatechange/overview

The study of the impact of climate on female agricultural workers is essential to understanding the nature of these challenges and providing insights that help in developing strategies to support them. Therefore, this study aims to explore the extent of female agricultural workers' knowledge of climate change and its effects, focusing on the professional, economic, and social challenges they face.

Study Issues

Climate change has become one of the greatest challenges facing various economic sectors worldwide, particularly the agricultural sector, which serves as a primary source of livelihood in developing countries. In Jordan, the agricultural sector is a fundamental pillar of the national economy, especially in rural areas like the Jordan Valley, where many families rely on agriculture as a main source of income. Despite the significance of this sector, female agricultural workers are significantly affected by the impacts of climate change, threatening the sustainability of their work. Official climate reports indicate that Jordan is experiencing notable climatic changes, including a 15-20% decrease in rainfall over the past three decades and a temperature increase of 1.5 degrees Celsius. These conditions severely impact agricultural productivity, exacerbating the economic and social burdens faced by female agricultural workers[5].

Hence, the need emerged to conduct a study that highlights the impact of climate change on female agricultural workers in Jordan, especially in the most affected areas such as the Jordan Valley, to understand the social and psychological effects they may face as a result of these changes, and to offer solutions around strategies that help in adapting to these changes.

Study Importance

This study holds significant scientific value as it helps bridge the knowledge gap regarding the effects of climate change on women working in agriculture in Jordan, a topic rarely addressed in research studies. The study will provide a comprehensive view of the potential impacts on these women at the productive, social, and psychological levels. It will also contribute to documenting the human dimensions of climate change impacts within the Jordanian context, where local scientific literature lacks detailed studies focusing on women in agriculture, thus adding scientific value to research in this field.

Practically and applicably, this study offers solutions to the problems faced by women

5 Ministry of Agriculture (2024). Climate changes in Jordan and their impact on the agricultural sector. https://www.moa.gov.jo/ebv4.0/root_storage/ar/eb_list_page/

in agriculture due to climate changes by analyzing the challenges they encounter in the agricultural sector. It could assist in improving governmental support policies for female farmers, such as developing climate adaptation techniques and providing appropriate training to enhance agricultural productivity under changing climatic conditions. Additionally, it could promote cooperation between governmental and non-governmental organizations to improve the economic and social conditions of women in agriculture and raise community awareness about their role in the agricultural sector. This, in turn, would help decision-makers take informed steps to address the challenges faced by these women and enhance the sustainability of the agricultural sector in Jordan.

From a social and psychological perspective, the importance of this study lies in understanding the psychological and social challenges faced by women working in agriculture due to climate changes, such as stress and economic pressures resulting from decreased agricultural productivity. It will also contribute to providing a clear picture of the social impacts that may arise from the increased workload on women in agriculture, thus highlighting the importance of providing psychological and social support to this segment of society.

Study Objectives

This study aims to explore the impact of climate change on female agricultural workers in Jordan as its main objective, from which several sub-objectives branch out:

- The level of awareness of Jordanian female farmers about climate change.
- Identifying the professional impacts of climate change on female agricultural workers in Jordan.
- Identifying the social impacts of climate change on female agricultural workers in Jordan.
- Identifying the economic impacts of climate change on female agricultural workers in Jordan.
- Identifying the psychological impacts of climate change on female agricultural workers in Jordan.
- Determining the key recommendations and solutions that may help Jordanian female farmers cope with climate change.

Terms and Concepts

- Climate Change: "A change in climate over time, which can be identified using statistical description through changes in the mean and/or variability of its characteristics, persisting for an extended period, typically decades or longer. Climate change may result from natural internal processes or external forces, such as variations in solar cycles, volcanic eruptions, or continuous human-induced changes in the composition of the atmosphere or land use.[6]"

- Additionally, climate change is also defined as: "Climate change that is directly or indirectly attributed to human activity, which causes a change in the global atmospheric composition, adding to the natural climate variability observed over comparable time periods.[7]"

- Agricultural Sector: One of the primary sources of food and supplies for the population, the agricultural sector is a cornerstone for achieving sustainable rural development. Its role extends beyond direct contribution to the national economy, encompassing various social, economic, and environmental dimensions. [8]

- It is also defined as: "The activities of crop production, animal production, and agricultural chemicals.[9]"

- Occupational Health: "The provision of a healthy, safe, and decent working environment, free from work-related injuries and accidents, and highly productive for workers across all sectors and professions by raising awareness and adhering to the best safety and occupational health standards and practices, ensuring workers' rights.[10]"

- Agricultural Worker: "Any person involved in agricultural activities, including general farm workers, all those working in a farm household, as well as a security guard (not employed in the private security industry) hired to guard the farm and areas where agricultural activities are conducted.[11]"

6 IPCC. (2018). Glossary of Terms. Available at https://www.ipcc.ch/site/assets/uploads/2018/03/wg2TARannexB.pdf

7 UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE. You'll find the 1st Article in the following link: conveng.pdf

8 Al-Arabiyat, Fatima. (2020). The Reality of the Jordanian Agricultural Sector, the Challenges it Faces and the Potential for its Development. The Arab Journal of Scientific Publishing. Issue (26). p.666. https://search.mandumah.com/Record/1440214

9 United Nations Economic and Social Commission for Western Asia (ESCWA). (2022). The Agricultural Sector. Retrieved from the website: The Agricultural Sector - United Nations Economic and Social Commission for Western Asia

10 Jordanian Ministry of Labor. (2025). Directorate of Occupational Safety and Health. Retrieved from the website: https://www.mol.gov.jo/AR/Pages

11 Molabeli L. (2023), Labour Guide. Farm worker basic conditions of contract: The sustainability initiative of South Africa working hours & wages in agriculture. Retrieved from https://siro.co.za/wp-content/uploads/SIZA

Theoretical Framework of the Study

Climate Change: A Look at Future Prospects

Climate change is one of the most significant and prominent challenges that has dominated the environmental sphere in recent times. This challenge inevitably points to long-term transformations in weather patterns and temperatures globally. Studies have indicated that human activity is the primary cause and the fundamental factor behind this phenomenon. According to the Intergovernmental Panel on Climate Change (IPCC) report of 2021, the global average temperature between 2011 and 2020 increased by approximately 1.1°C compared to pre-industrial levels. Based on this measure, it can be stated that the recorded average surface temperature of the Earth is higher than at any time in the past 100,000 years. [12]

Although natural factors, such as volcanic eruptions or changes in solar activity, do play a minor role in influencing climate fluctuations, the role of humans and human activity cannot be denied as the main driver since the early 19th century. A 2023 study by the United Nations showed that fossil fuels, including oil, coal, and natural gas, and their combustion result in the emission of greenhouse gases into the atmosphere, which, in turn, trap solar heat and increase temperatures[13]. Additionally, a study published in)Nature Climate Change(revealed that climate change, driven by these factors, is responsible for 37% of heat-related deaths globally.[14]

Impact of Climate Change on Agricultural Systems

Agricultural systems that produce food are one of the main sources of livelihood across the world. They not only provide food but also play a role in providing employment in farming for both women and men, enabling both genders to improve the well-being of their families and enhance their resilience. It can be said that climate changes have had a severe impact on various vital sectors, particularly on agriculture and its systems. The increase in temperature, decreased rainfall, drought, floods, and other factors have negatively affected agricultural crops. Climate change is not just about reduced production; it goes beyond that to include crop deterioration, the spread of diseases and pests, and the threat to agricultural lands. This, in turn, threatens food security, which will, sooner or later, lead

12 The Intergovernmental Panel on Climate Change (IPCC), 2021. Climate change (2021)
13 United Nations Report (2023). Climate Action. The following refers to the report link: UNEP_Annual_Report_2023.pdf
14 TRT Arabic Report. (2021). Study: Climate Change Responsible for 37% of Heat-Related Deaths. Retrieved from the website https://www.trtarabi.com/now

to concerns and doubts about the ability of these lands to provide the necessary amounts of food amid the rapidly growing population.

The fear regarding climate change increases in the Arab region, especially as studies have indicated that temperatures could exceed 60°C in the Middle East and Gulf countries in the near future. This not only poses a threat to the agricultural sector but also to public health and the overall safety of the economy[15]. A 2023 study by the Food and Agriculture Organization of the United Nations (FAO) revealed that agricultural productivity has already declined due to these conditions, with wheat yields being affected by climate change, decreasing by less than 0.1 tons per hectare between 2000 and 2019, about a 2% decrease in the average productivity during that period. The same is true for maize crops in South Africa, where maize yields decreased by more than 0.2 tons per hectare, a 5% reduction in the average yield during the same period. [16]

In 2013, the Intergovernmental Panel on Climate Change (IPCC) published scenarios for cumulative global carbon dioxide emissions through 2100 to show the forcing impact of increased carbon dioxide in the atmosphere. It became evident that this impact would equal 1% annually in the 2040-2049 period. The effect of this on the nutrient content of crops, such as proteins, vitamins, and minerals, will not be insignificant. The study showed that protein content in wheat had decreased by nearly 10% in some regions due to the increased carbon dioxide in the atmosphere[17]. Other studies have suggested that by 2050, the reduction in agricultural yields will raise food prices by up to 80%, which will exacerbate the crisis of reduced or even nonexistent agricultural production in many areas[18].

In a field study conducted specifically on women in agriculture in Iraq regarding the impact of climate change on their agricultural work, 82% of them reported a decrease in available water resources, including wells, tap water, irrigation canals, and rivers, among others. They indicated that they had been affected by adverse climatic events, while only 6% said they were not affected by any of these factors. Drought impacted more than 80% of the male and female farmers surveyed, followed by high temperatures, increased water salinity, and sandstorms, as reported by over 40% of them. Additionally, 10% of the farmers

15 Al Jazeera. (2022). Studies and experts monitor climatic and economic disasters threatening Arab countries due to climate change. Retrieved from the website: https://www.aljazeera.net/science/2022/12/5/%D8%A7%D9%84%D8%AA%D8%BA%D9%8A%D8%B1-%D8%A7%D9%84%D9%85%D9%86%D8%A7%D8%AE%D9%8A-2#:~:text=%D9%88%D8%B1%D8%B5%D8%AF%D8%AA%20%D8%AD%D9%84%D9%82%D8%A9%20(2022%2F12%2F,%D8%AD%D9%8A%D8%A7%D8%A9%20%D8%A7%D9%84%D9%86%D8%A7%D8%B3%20%D9%88%D8%A7%D9%84%D8%A3%D9%86%D8%B4%D8%B7%D8%A9%20%D8%A7%D9%84%D8%B2%D8%B1%D8%A7%D8%B9%D9%8A%D8%A9%20%D9%88%D8%A7%D9%84%D8%A7%D9%82%D8%AA%D8%B5%D8%A7%D8%AF%D9%8A%D8%A9%D8%8C

16 Food and Agriculture Organization of the United Nations. (2023). The Impact of Disasters on Agriculture and Food Security. Retrieved from the website: https://www.fao.org/publications/home/fao-flagship-publications/the-impact-of-disasters-on-agriculture-and-food-security/en

17 Intergovernmental Panel on Climate Change. (2013). Climate Change 2013: The Physical Science Basis. Retrieved from the website: https://www.ipcc.ch/report/ar5/wg1/

18 Sky News Arabia. (2023). Climate Change: Severe Negative Impacts on Agricultural Activities. Retrieved from the website: لتغير المناخ.. آثار سلبية وخيمة على الأنشطة الزراعية | سكاي نيوز عربية

attributed the destruction of their winter crops to cold weather[19].

The study also found that 50% of the trees relied on water-saving and improved irrigation techniques, such as water sprinklers, instead of flooding, with only 17% of the farmers using these techniques. Respondents reported significant impacts on their agricultural activities due to climate change, including reduced yields and fewer livestock owned. Apart from decreased profits, there was an increase in expenses due to higher feed prices and other arising costs, such as drilling new wells, the need for water pumps for wells, generators, and fuel for the pumps, or even situations where purchasing water became necessary. The types of crops grown were reduced, livestock diseases increased, and farming ceased temporarily or even permanently in some cases, not to mention the reduced size of cultivated lands, the presence of pests, and decreased product quality. There were also fewer mentions of issues related to accessing and reducing grazing areas and changing crop types, such as focusing on vegetable cultivation[20].

The vast majority reported a decrease in income—often pointing to a significant drop—highlighting the impact of climate change on the family. Some had to borrow money (and fell into debt); family members turned to daily-wage jobs, for example, in construction and agriculture, alongside fishing in some locations; disposable income decreased; and health issues arose from sandstorms, such as asthma and allergies. When asked about the strategies they adopted to cope with environmental events, reducing household expenses was the most common response, cited by 46% of the participants, followed by water conservation, borrowing money (32%), and changing agricultural activities (17%). Additionally, 29% considered abandoning agriculture due to these climatic events, while the rest did not consider leaving it.

Finally, respondents were asked to identify who they believed was most affected by climate changes—men or women. According to 61% of them, men and women were equally affected, while the remaining percentage was almost evenly split between those who believed men were more affected and those who believed women bore the brunt of climate change. The reasoning behind considering men as more affected by climate change, according to those who held this view, was that men are responsible for livelihoods, and since climate change impacts livelihoods, men are more affected than women. Men also need to find alternative sources of income to meet the family's needs, often requiring migration and travel to find work. On the other hand, women—according to their

19 International Organization of Migration. (2023). Women in Agriculture in Iraq: An Assessment. Available at https://edf.iom.int/en/iraq/publications/women-in-agriculture-in-iraq-an-assessment

20 Previous resource

perspective—felt more affected by climate change compared to men. This perception was due to social norms that they believed prevented them from finding alternative sources of income, unlike men, who could become daily wage laborers, for example. As a result, women had to work harder due to climate change and with fewer resources, alongside their caregiving duties, making them more vulnerable to health issues caused by climate change. Additionally, they had to manage family care with fewer available resources[21].

The Impact of Climate Change on Women Working in Agriculture

Rural women often manage multi-generational households and seek income from various sources, one of which is employment in the agricultural sector. Their typical daily tasks include crop cultivation, animal handling, food production and preparation, and wage work in agriculture or other rural jobs[22]. According to the United Nations Development Programme, women not only work on their family-owned lands but also become laborers on lands owned by others, especially during planting and harvesting seasons. Thus, women's contributions to the agricultural sector are highly significant. However, their income is substantially lower than that of men because they do not have the same level of access to resources and productive opportunities[23].

According to a 2023 study by the Food and Agriculture Organization (FAO), agricultural food systems are among the largest sources of employment for both women and men. Globally, 36% of women working in agricultural food systems and 38% of men are employed in these systems. For both genders, this represents a decline of about 10 percentage points since 2005, mainly due to decreased employment in primary agricultural production compared to previous years. This decline is attributed to various reasons, including reduced crop yields caused by water scarcity, the spread of diseases and pests that devastate agricultural lands, and drought resulting from increased temperatures due to the accumulation of greenhouse gases in the atmosphere, which cause global warming[24].

Women make up 48% of the agricultural workforce in low-income countries and more than 55% of the total agricultural workers in rural South Asia and Africa[25]. Because they rely on agriculture as a primary income source, women are the most affected by climate changes. A report on gender equality and climate change in Jordan by WANA and International Alert

21 Previous resource

22 United Nations Population Fund (UNFPA). (2011). Pakistan flooding: one year later. Available at: https://www.unfpa.org/news/pakistan-flooding-one-year-later

23 IPCC (2019). Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. IPCC, Geneva

24 Food and Agriculture Organization of the United Nations. (2023). The Status of Women in Agrifood Systems. Available on the website: https://www.fao.org/gender/the-status-of-women-in-agrifood-systems/en

25 United Nations Women (UN Women). (2020). Rural women, key for a world free from hunger and poverty. International Day of Rural Women. Observations. UN Women, New York. Available at: https://www.un.org/en/observances/rural-women-day

indicated that climate change significantly affects women in rural Jordan, especially since the country suffers from a steady increase in temperatures by 1.5°C and water scarcity due to a 15-20% decrease in rainfall. This has led to drier lands and the deterioration of foodstuffs and crops, which can no longer provide the necessary food security, putting 3.5% of Jordan's total agricultural GDP at risk[26].

Women contribute significantly to agricultural and food production; however, measuring their output is challenging due to the varying levels of women's participation in the workforce across different regions. Nonetheless, women have higher rates of unpaid, seasonal, and part-time jobs, and studies show that women often earn less than men for the same work[27]. It is worth noting that there are gender gaps in many assets, inputs, and services, including land, livestock, labor, education, extension, information, financial services, and technology. Moreover, women are underrepresented in local organizations and rural administrative structures, giving them fewer opportunities to influence decision-making processes in agricultural development.

The number of women working in Jordan's Jordan Valley regions is approximately 10,000[28]. In a survey conducted to study their situation and identify the challenges they face in the agricultural sector, one participant in the discussion sessions mentioned that they are forced to accept their current conditions due to the economic situation, the presence of children, and difficult living conditions. As a result, the overall economic shifts, particularly during the COVID-19 pandemic, have contributed to the significant decline in the agricultural sector over recent years. Despite this, agricultural work still provides a refuge for thousands of women seeking job opportunities to support their families by improving their monthly income. Consequently, many women in the Northern Jordan Valley district generally turn to work in the agricultural sector[29].

One participant highlighted the difficulty of the work, stating that they suffer from various ailments, including back pain, herniated discs, and foot pain, especially since working in the Jordan Valley (Al-Aghwar) is exhausting due to the weather. The nature of work for women in the agricultural sector is characterized by multiple risks that threaten their health and working lives due to the arduous agricultural tasks, long working hours, lack of consideration for physical differences between women and men, high temperatures

26 UNPD.(2023) .Gender Equality and Climate Change in Jordan: Exploratory Gender Analysis. https://www.undp.org/jordan/publications/gender-equality-and-climate-change-jordan-exploratory-gender-analysis

27 Chanana-Nag, N., & Aggarwal, P. (2018). Woman in agriculture, and climate risks: hotspots for development. Springer Nature Link. V(158). 13-27.

28 Mazen, S. & Jundi, K. (2017). A mini Prospective Study, Women in the Agriculture Sector. "Hard Work, Hard Life". Tamkeen Center for Support and Assistance

29 Wana Institute. (2021). Women Working in the Agricultural Sector within the Northern Jordan Valley District: Realities and Challenges. Available at https://wanainstitute.org/en/publication/women-agriculture-sector-northern-jordan-valley-district-irbid-governorate-reality-and

during working hours, and the absence of occupational health and safety equipment, making them more susceptible to risks and injuries during work.

Based on the above, it can be pointed out that there are a set of challenges facing women working in the agricultural sector, which can be considered serious challenges that negatively affect women's physical and mental health in the short term and extend over the long term, impacting their active social and economic participation. These challenges include:

1. Unsafe Transportation: Appropriate transportation for working women may not be available, as the usual means of transport are typically small buses or pickup trucks, carrying between 5-30 passengers, exceeding the vehicle's capacity. This situation increases the risk of injury for working women while commuting to work.

2. Low Wages: Female workers receive very meager wages compared to the effort exerted in their work, and they do not receive any additional pay if they work during holidays or official holidays. Poverty, unemployment, and the scarcity of job opportunities within the district force them to accept low wages and difficult working conditions, despite the existence of regulations and systems that guarantee workers' rights in the agricultural sector, such as minimum wages and leave, according to the labor law. Their low wages and other issues constitute a clear violation of these legal provisions[30].

3. Work Injuries: Women may be exposed to various injuries at the workplace, such as heatstroke due to long working hours and high temperatures, or strenuous tasks, as well as injuries from commuting to and from work due to overcrowding, snake bites, or suffocation from prolonged stays in greenhouses.

In addition to the above, if a female worker gets injured at work, she is often not treated immediately or taken to the nearest hospital due to the employer's hesitation or lack of concern, or due to the absence of occupational health and safety equipment at the workplace. Even when such equipment is available, workers often cannot handle emergencies properly due to their weak first-aid skills and the lack of a special mechanism to deal with the mentioned injuries. Furthermore, the geographic distance of some areas from health centers poses a significant obstacle in case of injury and the need for treatment for working women[31].

30 See Article (7) and Article (8) of the Jordanian Agricultural Workers Regulation No. (19) of 2021, published in Official Gazette Issue No. 5715 on 2/5/2021, page 1571.

31 Wana Institute. (2021). A previous Reference

Chapter Two: Methodology and Practical Applications

Study Type and Methodology

This study is classified as exploratory research, a type of primary research aimed at identifying and examining a specific subject or phenomenon without attempting to test predefined hypotheses. The purpose is to assess the feasibility of conducting a more in-depth study on the topic, exploring the dimensions of the phenomenon under investigation[32].

The study adopts a survey methodology, combining both qualitative and quantitative approaches. The survey method is one of the most suitable for obtaining data and information to describe a phenomenon and build a foundational database[33]. Within this framework, the study seeks to survey Jordanian female agricultural workers by examining their working conditions through field visits, focus group discussions, and structured questions to understand the impact of climate change on them across multiple dimensions.

Population and Sample

The study population consists of Jordanian female agricultural workers in the northern, central, and southern regions of the Jordan Valley. A convenient sample of **556 participants** was selected for data collection and analysis. Additionally, another convenient sample of **25 participants** was chosen for focus group discussions to enrich the research and yield the best results.

Data Collection Tools

▪ Observation Tool

As part of the survey methodology, the observation tool was used as a primary means of collecting data about the real-life conditions of female agricultural workers in Jordan. Field visits were conducted to farms in the Jordan Valley, where researchers observed the women performing their daily tasks, including planting and harvesting crops.

The observations focused on various aspects of the work environment, such as the nature of tasks performed by the workers, the climatic conditions under which they worked, and

32 Al-hizan, Mohammed. (2010). Media Research (Foundations, Methods, Fields), Riyadh: King Fahd National Library, p. 23 https://waqfeya.net/books/%D8%A7%D9%84%D8%A8%D8%AD%D9%88%D8%AB-%D8%A7%D9%84%D8%A5%D8%B9%D9%84%D8%A7%D9%85%D9%8A%D8%A9-%D8%A3%D8%B3%D8%B3%D9%87%D8%A7-%D8%A3%D8%B3%D8%A7%D9%84%D9%8A%D8%A8%D9%87%D8%A7-%D9%85%D8%AC%D8%A7%D9%-84%D8%A7%D8%AA%D9%87%D8%A7-2abeb932d5c8406e9896328cec1807ff#google_vignette

33 Hussein, Samir Mohammed. (1995). Studies in Research Methodologies, Cairo: Alam Al-Kutub, p. 147. https://www.noor-book.com/tag/%D8%AF%D8%B1%D8%A7%D8%B3%D8%A7%D8%AA-%D9%81%D9%8A-%D9%85%D9%86%D8%A7%D9%87%D8%AC-%D8%A7%D9%84%D8%A8%D8%AD%D8%AB-%D8%A7%D9%84%D8%B9%D9%84%D9%85%D9%8A-%D8%A8%D8%AD%D9%88%D8%AB-%D8%A7%D9%84%D8%A5%D8%B9%D9%84%D8%A7%D9%85

the extent to which climate changes affected their productivity and working conditions. Observations were recorded following visits to six different locations in the Jordan Valley: Ghor Safi, Ghor Al-Rawdah, Ghor Al-Hadithah, Al-Kareema, and Sheikh Hussein Bridge. These observations supported data analysis and provided precise recommendations based on the workers' actual experiences.

- **Focus Group Discussions**

Focus groups are among the most commonly used research tools in qualitative research. Focus groups are a tool for gathering information that relies on a specific type of interview in terms of purpose, design, and procedures. It is a structured discussion aimed at obtaining information related to a specific topic in a comfortable and safe environment[34]. In this research, the focus groups consisted of six groups, where Jordanian female workers from the central, northern, and southern Jordan Valley regions were selected. Six community facilitators were chosen to conduct the focus group discussions. They were selected for their expertise in this field, as they regularly manage many such sessions or similar ones due to their work and specialization. The facilitators took notes and captured photos with written consent from the workers.

- **Questionnaire Tool**

An electronic questionnaire tool was used as a research instrument to collect data and information, as it is one of the most suitable tools for gathering data. It was designed in line with the study's objectives, and the facilitators were involved in collecting responses from the Jordanian female workers in the study. The questionnaire consisted of several sections, addressing the demographic variables of the respondents, their level of knowledge about climate change, as well as the professional, social, economic, and psychological impacts of climate change, and the proposed solutions that could help them in addressing climate change.

34 Al-Kadi, Amjad Badr Mansour, Al-Faqih, Diyala Mousa. (2022). Addressing Cyberbullying on Social Media among Jordanian Youth: A Qualitative Study. Journal of the Arab Universities Union for Media Research and Communication Technology.
(PDF) معالجة التنمر الإلكتروني في مواقع التواصل الاجتماعي لدى الشباب الاردني : دراسة كيفية

Demographic Characteristics of the Study Sample

Table 1 Demographic Characteristics of the Study Sample

Variable	Category	Frequency	Percentage (%)
Age Group	Less than 15 years	15	2.7
	15–18 years	31	5.6
	18–30 years	187	33.6
	31–50 years	246	44.2
	51–60 years	74	13.3
	61 years and above	3	0.5
Nationality	Jordanian	396	71.2
	Syrian	158	28.4
	Egyptian	2	0.4
Region	Northern Jordan Valley	279	50.2
	Central Jordan Valley	129	23.2
	Southern Jordan Valley	148	26.6
Educational Level	Illiterate	52	9.3
	Can read and write	65	11.7
	Primary education	144	25.9
	Intermediate/Secondary education	254	45.7
	College	20	3.6
	University education	21	3.8
Marital Status	Married	369	66.4
	Single	117	21.0
	Widowed	36	6.5
	Divorced	34	6.1
Total		556	100%

The data presented in Table (1) illustrate the demographic characteristics of the study sample, which pertains to female workers in the agricultural sector in the Jordan Valley region. The results indicate that the age group (31–50 years) represents the highest percentage among the respondents at (44.2%), followed by the age group (18–30 years) at (33.6%), while the age group (61 years and above) ranks last at (0.5%).

Regarding nationality, Jordanian workers constituted the largest percentage at (71.2%), followed by Syrian workers at (28.4%), while the percentage of Egyptian workers was very minimal, standing at (0.4%).

In terms of educational level, the data show that (45.7%) of the workers had intermediate or secondary education, while (25.9%) had completed primary education. The percentage of workers with university-level education was very low at (3.8%), whereas the illiteracy rate among the workers was (9.3%).

As for marital status, the majority of workers were married, making up (66.4%) of the sample, followed by single workers at (21%). Meanwhile, the percentages of divorced and widowed workers were (6.1%) and (6.5%), respectively.

Validity and Reliability Tests

Validity Test: Face validity was used for the study instruments by consulting a group of three experts and specialists in the field of agricultural research to evaluate their suitability."

Reliability Test: Reliability refers to "the ability of the instrument to provide consistent results when used multiple times35." Observer reliability was utilized to verify the consistency of the observation tool, involving multiple observers using the same tool. Their results were then compared to ensure agreement. Six researchers were trained on how to use the observation tool to measure the phenomenon, specifically the impact of climate change on female workers in the agricultural sector in Jordan.

The test-retest method was used over two different periods on (10) individuals from the study sample, with a time gap of (7) days, to verify the reliability of the interview tool. Cronbach's alpha coefficient was employed to check the reliability of the questionnaire items, with values ranging between (0.71 - 0.76) for the individual sections of the study tool. For the overall scale, it achieved a value of (0.86), indicating tool reliability according to Nunnally's criterion, which considers (0.70) as the minimum acceptable threshold for reliability.

35 Al- hizan, Mohammed. (2010). Previous Resource. Page 65

Statistical Methods

The Statistical Package for the Social Sciences (SPSS) was used for data entry, processing, and analysis by employing the following statistical tools and tests:

- Frequencies and percentages.
- Arithmetic means and standard deviations.
- Reliability test (Cronbach's Alpha) to calculate the internal consistency coefficient.

Chapter Three: Presentation of Results

Presentation and Discussion of Results

Global studies show that women working in the agricultural sector are among the groups most affected by climate change due to their work in environments characterized by harsh conditions, resource scarcity, and lack of support. In Jordan, these challenges are exacerbated by declining rainfall rates and rising temperatures, which intensify the fragility of the agricultural sector and weaken the ability of women workers to cope with these changes.

This study aims to shed light on the conditions faced by women working in agriculture, with a focus on the challenging environmental circumstances and the lack of resources and available support. Using a field-based methodology that relies on various data collection tools, the study seeks to provide practical and effective recommendations. These recommendations aim to enhance the capacity of women to adapt to climate change and ensure the sustainability of the agricultural sector in the face of future environmental challenges.

First: Results of the Questionnaire Tool

The results of the study represent a central aspect of data analysis, where each of the 26 questions in the questionnaire will be reviewed, along with the respondents' answers. The Statistical Package for the Social Sciences (SPSS) was used as the primary tool for data analysis and result extraction, ensuring accuracy and objectivity in interpreting the data and providing a comprehensive perspective that contributes to achieving the study's objectives in a scientific and systematic manner.

First: General Information About the Nature of Work

1. Nature of Agricultural Activity

The nature of agricultural activity was analyzed by extracting frequencies and percentages from the respondents' answers. The results are detailed in the attached Table No. (2), which accurately reflects the data distribution to provide a comprehensive understanding of the adopted agricultural patterns.

Table 2 Nature of Agricultural Activity Practiced by Female Workers

Activity	Frequency	Percentage
Crop farming	551	99.1%
Livestock rearing	34	6.1%
Agricultural food industries	10	1.8%
Other activities	3	0.5%

Multiple choices (N=556)

The data presented in Table No. (2) indicates that the majority of women working in the agricultural sector in Jordan are engaged in crop farming, representing 99.1%, followed by livestock rearing at 6.1%, and agricultural food industries at 1.8%. This distribution reflects economic, social, and cultural factors that influence the nature of agricultural work in Jordan.

The predominance of women working in crop farming can be attributed to several factors, most notably the widespread presence of this activity in the Jordan Valley, where agricultural lands are abundant and easily accessible. The Jordan Valley is considered Jordan's "food basket," making this activity of significant economic importance. Additionally, crop farming does not require intensive physical effort or advanced technical skills, making it a suitable option for women and enabling their active participation in this vital sector.

As for livestock rearing, it is closely tied to the living needs of rural communities, where residents rely on dairy and meat products as sources of income and food. This activity also does not require complex care, making it an accessible option for women in these areas.

Regarding food industries, their limited percentage reflects the low prevalence of specialized facilities and factories in the Jordan Valley. This sector requires advanced infrastructure, which is not widely available in these areas.

In addition, female agricultural workers perform various roles, including installing crop irrigation pumps, tending to plants, setting up irrigation networks, working in small nurseries, and planting flowers. These diverse tasks highlight the significant contribution of women to various aspects of agricultural activities.

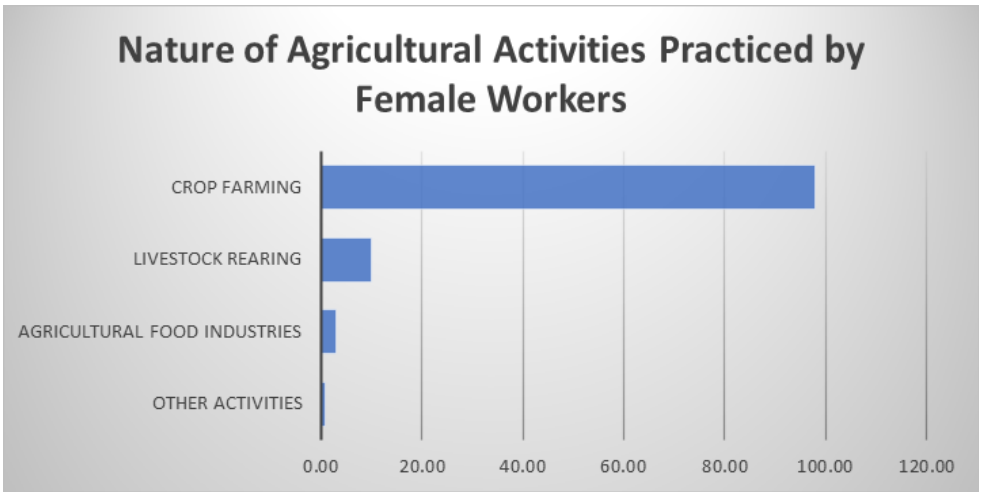

Figure 1 Nature of Agricultural Activities Practiced by Female Workers

2. Are you a farm owner, or do you work on a farm?

An analysis was conducted on the responses to the question, with data meticulously extracted to provide a clear presentation of the frequencies and percentages of the answers. The results are detailed in Table No. (3), offering a deeper understanding of the patterns and trends identified.

Table 3 Nature of Work of Female Workers in the Agricultural Sector

Category	Frequency	Percentage
Farm Owner	37	6.7%
Work on a Farm	460	82.7%
Work with Family	59	10.6%
Total	**556**	**100%**

The data presented in Table No. (3) indicates that the vast majority of women work on farms owned by others, accounting for 82.7%, reflecting the significant reliance of the agricultural sector on female labor. Meanwhile, only 6.7% of women own and work on their own farms. The remaining 10.6% represents women who work with their families on family-owned farms.

These figures highlight the challenges women face in owning private farms, often linked to limited economic and social capacities. Additionally, difficult environmental conditions, such as rising temperatures and water scarcity, further complicate the situation. One farmer noted that she had to abandon three out of nine dunums due to a lack of water.

▪ Secondly: Level of Awareness of Female Farmers on Climate Change

1. How familiar are you with the concept of climate change?

Table No. (4) presents a detailed analysis of the respondents' answers regarding their awareness of the concept of climate change. The responses were classified according to frequencies and percentages, providing a deeper understanding of the level of awareness and knowledge among the participants on this topic.

Table 4 Female Workers' Knowledge Level of Climate Change Concept

Response Options	Frequency	Percentage
I have heard of it, but my knowledge is limited	400	72%
I have good knowledge	152	27.3%
I have in-depth knowledge	4	0.7%
Total	556	100%

Female workers in the agricultural sector in Jordan are among the most affected by the consequences of climate change, as they face significant challenges due to harsh environmental conditions and lack of resources and support. The data indicates that the majority of female workers have limited knowledge of the concept of climate change, with 72% reporting limited knowledge, 27.3% with good knowledge, and only 0.7% with in-depth knowledge.

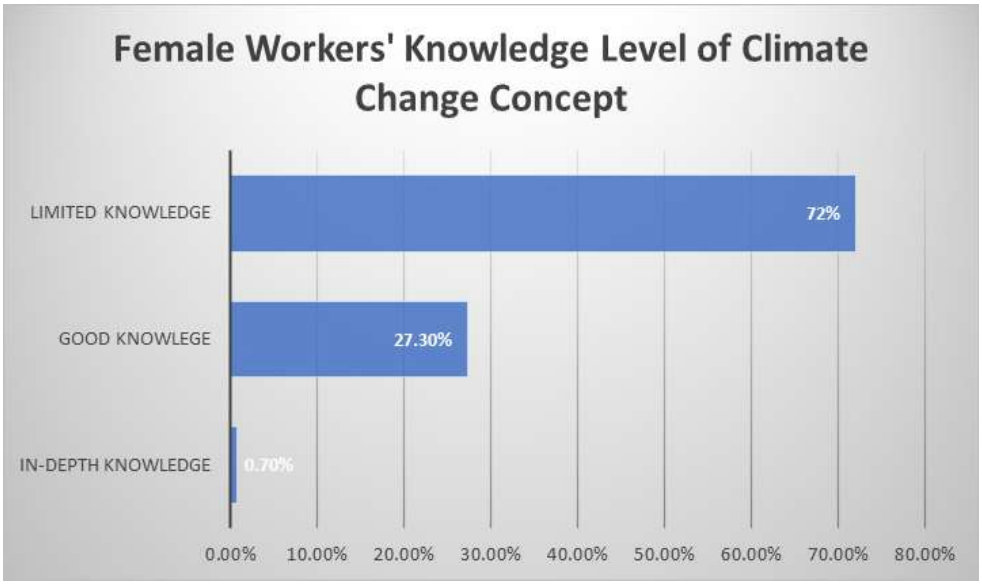

Figure 2 Female Workers' Knowledge Level of Climate Change Concept.

This low level of awareness is attributed to several factors, the most prominent of which is the low educational level among most of the workers in this sector. This hinders their understanding of complex issues such as climate change and its impacts. Additionally, their focus is primarily on the daily challenges they face in their work, such as securing income and improving production to support their families, which reduces their interest in environmental issues.

Testimonies from some workers indicate that there is a general awareness of changes in agricultural patterns, such as altered planting schedules, but this awareness is not linked to a deeper understanding of the concept of climate change or its future impacts. One of the farmers mentioned that the lack of awareness on this issue leads to a lack of organization in farming, both at the level of workers and farm owners.

One of the agricultural workers: "Farmers know what's happening, but they don't hear the term 'climate change.' For example, they used to plant in September, now it's in December. The situation is changing, that's what they know, but they don't understand the extent of the impact or what will happen in the future."

Another farmer: "If there was awareness or knowledge about this issue, there would have been better organization in farming. We're talking about the workers, the farm owners, and the farmers—if they had awareness, they would have organized their work, organized the months in which they could plant."

2. Where did you get your information about climate change?

Information about climate change was obtained from multiple sources, and the data was analyzed by extracting frequencies and percentages of the responses provided by the participants. The details are clearly shown in Table (5), which presents the results in an organized and comprehensive manner.

Table 5 Sources of knowledge related to the concept of climate change

#	Statement	Frequency	Percentage	Rank
1	Media (TV, Internet)	241	43.3%	2
2	Agricultural or cooperative associations	114	20.5%	3
3	Training courses	89	16.0%	4
4	Through work or practical experience	344	61.9%	1
5	Other sources	26	4.7%	5

Multiple choice (N=556)

The data presented in Table (5) indicates that women workers in the agricultural sector primarily rely on practical experience as their main source of information about climate change, with 61.9% of participants depending on this source. This is followed by media sources such as TV and the internet at 43.3%, and agricultural or cooperative associations at 20.5%. Training courses ranked fourth at 16%, while other sources came last at 4.7%.

Some respondents also clarified that they rely on other sources to obtain information, such as Tamkeen Association facilitators for support and assistance, or social media platforms. One worker mentioned that social media now publishes awareness content for farmers on how to deal with climate changes, such as frost waves. However, few of the workers obtain this information directly from farm owners.

The results show that women workers heavily rely on direct experience and practical knowledge, reflecting their close connection to the daily realities of agricultural work and their direct observations of climate changes and their impact on crops and production. This practical experience, which some have accumulated over more than 20 years, provides them with a deep understanding of climate change, even if the scientific term is not familiar to them.

Nevertheless, the results indicate the limited training opportunities and awareness-raising workshops available to women workers in this sector. As a result, they primarily rely on exchanging experiences with their colleagues at work and on the media to bridge the knowledge gap. These means seem to be more accessible compared to training courses or seminars, which may be less available or harder to access for the workers.

One of the workers says: 'We deal with social media, and awareness is being spread to farmers. Regardless of the law for women workers in agriculture, there is awareness for the farmers themselves, such as how they can work on their farms during frost waves.

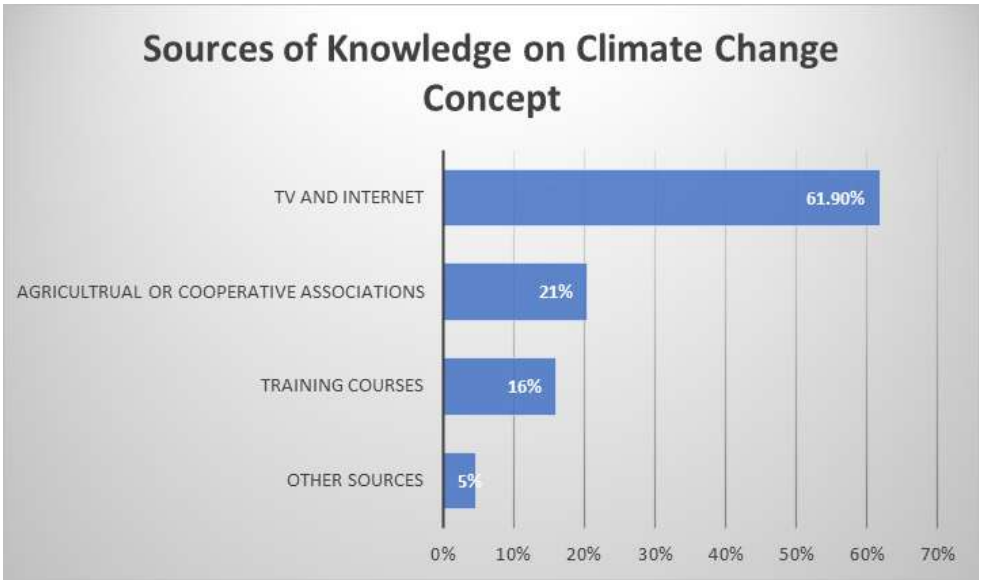

Figure 3 Sources of Knowledge on Climate Change Concept

3. Do you know that climate change can directly affect agriculture?

The data extracted from the responses of the interviewees were analyzed to provide accurate conclusions. The results are presented in Table (6), where the frequencies and percentages for each response were determined.

Table 6 Female Workers' Awareness of the Direct Impact of Climate Change on Agriculture

Alternatives	Frequency	Percentage
Yes	513	92.3%
No	27	4.8%
Not sure	16	2.9%
Total	556	100%

The data in Table (6) indicates a high level of awareness among agricultural workers regarding the direct impact of climate change on the agricultural sector. A large proportion of them (92.3%) reported having direct knowledge of this impact, while only 4.8% of the workers lacked knowledge, and 2.9% were unsure.

This high level of awareness can be explained by the nature of agricultural work itself, which heavily relies on practical experience and daily encounters in the fields. Climate changes, such as temperature fluctuations, drought, or heavy rainfall, directly affect agricultural crops, making workers more aware of the consequences of these changes. Their daily experiences in the fields contribute to enhancing their understanding of the impact of climate change on agricultural production.

Additionally, the testimonies of the workers indicate their clear awareness of the effects of climate change, including a decline in crop quality, increased production costs, and reduced cultivated areas. Phenomena such as recurring drought and water scarcity deepen this awareness, as the workers face daily challenges related to these phenomena. This awareness is not limited to theoretical knowledge; rather, it stems from direct practical experience, which enhances the field knowledge they have acquired.

These results make it clear that the workers' awareness of the effects of climate change

reflects a real practical experience, which requires sustainable support to enhance the resilience of the agricultural sector and its workers. Investing in building the capacities of workers and providing the necessary resources to adapt to climate change can help reduce the negative impacts of this phenomenon and ensure the sustainability of agricultural production.

4. What are the most prominent manifestations of climate change you have noticed in your area?

Table (7) shows a detailed analysis of the respondents' answers regarding the most prominent manifestations of climate change in their regions. The responses were classified, and the frequencies and percentages for each phenomenon were extracted.

Table 7 Major Climate Change Indicators Noticed by Female Workers in Their Areas

#	Phrases	Frequency	Percentage	Rank
1	Rising temperatures	511	91.9%	1
2	Water scarcity or shortage	375	67.4%	3
3	Changes in rainfall timings	411	73.9%	2
4	Increase in sandstorms or winds	355	63.8%	4
5	Migration of agriculture (leaving land uncultivated)	192	34.5%	5
5	Other changes	7	1.3%	6

Multiple choice (N=556)

The data in Table (7) indicates that climate change has become a major challenge that directly affects the agricultural sector, especially through the manifestations noticed by agricultural workers. The most prominent of these manifestations include rising temperatures at 91.9%, changes in rainfall timings at 73.9%, water scarcity or shortage at 67.4%, and finally, migration of agriculture (leaving land uncultivated) at 34.5%.

Analysis of these figures shows that climate change is no longer just an environmental

issue, but has become a practical challenge affecting agricultural production and food security. Agricultural workers experience these changes daily and are aware of the climatic manifestations that negatively impact the agricultural sector. Additionally, they pointed out other phenomena, such as frost, which is one of the main factors causing significant damage to crops during their sensitive growth stages.

The workers also indicated that these climate changes have confused farm owners, as it has become difficult to determine the right times for planting, leading to losses due to crops being planted at unsuitable times. Furthermore, floods, strong winds, and storms present additional challenges due to the erosion of soil, crop damage, and the destruction of irrigation systems and agricultural infrastructure. Moreover, soil dryness is closely related to changes in rainfall timings and rates, making it harder to irrigate crops and generally affecting agricultural production.

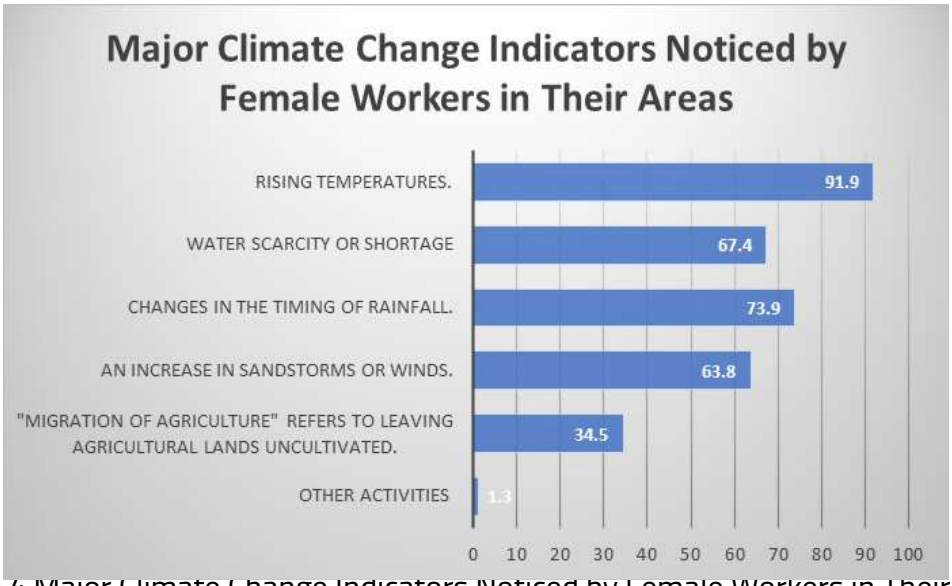

Figure 4 Major Climate Change Indicators Noticed by Female Workers in Their Areas

5. Do you think there is a relationship between climate change and the decrease in your agricultural productivity?

The data were analyzed, and the frequencies and percentages related to the respondents' answers were extracted. The results were summarized and presented in an organized manner in Table 8.

Table 8 Relationship Between Climate Change and Productivity as Perceived by Female Workers in Agriculture

Alternatives	Frequency	Percentage
Yes	491	88.3%
No	41	7.4%
Not sure	24	4.3%
Total	556	100%

The data in Table (8) indicates that the majority of agricultural workers in Jordan recognize the impact of climate change on their agricultural productivity. The percentage of workers who believe there is a relationship between climate change and decreased productivity is 88.3%. In contrast, 7.4% believe there is no relationship, while 4.3% are unsure.

The data shows significant awareness among agricultural workers in Jordan regarding the impact of climate change on their agricultural productivity. A large percentage of them (88.3%) reported believing in a relationship between climate change and decreased productivity, reflecting their recognition of environmental challenges and their direct effect on their work.

This high percentage is based on the practical experience that workers have gained from their daily agricultural activities, where they directly face the effects of climate change, such as temperature fluctuations, frost, and drought. These changes are not limited to a specific growing season but extend to both the summer and winter seasons, leading to severe crop losses and decreased productivity, thereby affecting the demand for labor in the agricultural sector.

Workers' testimonies also indicate that climate changes increase the burdens on farmers, especially with rising temperatures during the summer and the lack of rain in the winter. These conditions lead to the destruction of crops, negatively affecting agricultural productivity and placing a heavy burden on both workers and farmers alike.

6. Are you familiar with modern agricultural techniques that help in addressing climate change?

The responses were analyzed, and the frequencies and percentages of the respondents were extracted, as detailed in Table (9).

Table 9 Female Workers' Knowledge of Modern Agricultural Techniques to Address Climate Change

Alternatives	Frequency	Percentage
Yes	259	46.6%
No	297	53.4%
Total	556	100%

The data in Table (9) indicates that a significant percentage of agricultural workers lack sufficient knowledge of modern agricultural techniques that help address the challenges of climate change. The percentage of those who are not familiar with these techniques is 53.4%, compared to 46.6% who have knowledge of them. This situation reflects a major challenge that requires a multifaceted approach.

Among the possible reasons for the low level of knowledge about modern agricultural techniques among workers, one can point to limited financial resources that hinder access to these techniques, as well as a lack of training programs aimed at empowering workers to understand and apply these techniques. Additionally, there may be resistance to change due to reliance on traditional farming methods that they are accustomed to, making the transition to modern practices more difficult without effective awareness-raising and educational interventions.

To overcome these challenges, according to the responses from workers, it is essential to focus on launching continuous awareness initiatives targeting female agricultural workers, while providing innovative educational tools such as simulations and practical activities that help enhance understanding and practical application of modern techniques. Additionally, providing financial and technical support can contribute to facilitating the adoption of these sustainable practices.

Moreover, it is important to build partnerships between agricultural institutions, governments, and non-governmental organizations to develop comprehensive training programs targeting female workers in rural areas, with a focus on enhancing the skills needed to deal with climate and environmental challenges.

▪ Third: The Professional Impacts of Climate Change

1. What changes have you noticed in the agricultural work environment due to climate change?

The data was analyzed, and the frequencies and percentages of the responses from the respondents were extracted, and the results were presented in detail in Table (10) to illustrate the findings clearly and directly.

Table 10 Changes Noticed by Female Workers in Agricultural Work Environment Due to Climate Change

#	Statements	Frequency	Percentage	Rank
1	Change in planting seasons	414	74.5%	2
2	Increased working hours	187	33.6%	4
3	Reduced crop yield	493	88.7%	1
4	Increased costs (e.g., water or seeds)	227	40.8%	3
5	Other changes	22	4.0%	5

Multiple choice (N=556)

The data in Table (10) addresses the impacts of climate change on the agricultural work environment, highlighting a range of challenges faced by workers in this sector according to their observations. The most prominent of these challenges is the significant reduction in crop yield, with 88.7%, reflecting the direct impact of climate change on agricultural production. Workers also reported a change in planting seasons (74.5%), indicating disruption in the traditional farming cycle due to shifting weather patterns.

Among the other observed challenges was the increase in costs, reported by 40.8%, including expenses for irrigation, pesticides, feed, and other agricultural inputs. Additionally, 33.6% of workers observed an increase in working hours due to the need for additional efforts to adapt to the changing climate conditions. A small percentage (4%) mentioned other diverse changes.

Climate change directly affects agricultural crops, as rising temperatures or weather fluctuations like droughts or heavy rainfall disrupt crop growth and increase exposure to pests and diseases. This impact extends to the timing of the agricultural season, where any change in it could lead to decreased productivity or delayed crop growth.

Moreover, the decline in agricultural production has significant economic and social effects. Workers reported fewer job opportunities due to reduced production, which negatively impacts communities that rely primarily on agriculture as a main source of income. However, some cases have shown adaptation strategies to cope with climate changes, such as planting beans in greenhouses, which have contributed to increased production.

Additionally, female farmers face other economic challenges, such as rising costs of livestock medicine and feed, further increasing financial burdens. They also noted the impact of climate changes on the quality of agricultural products, such as the yellowing of crops and delayed production, which affects prices and increases economic pressures.

Finally, workers pointed out the impact of climate change on home-based agricultural projects like dairy farming, where the incidence of diseases in livestock has increased due to these changes. Furthermore, the delay in planting requires additional efforts to replant damaged crops, hindering progress in agricultural operations and increasing the challenges faced by workers in this sector.

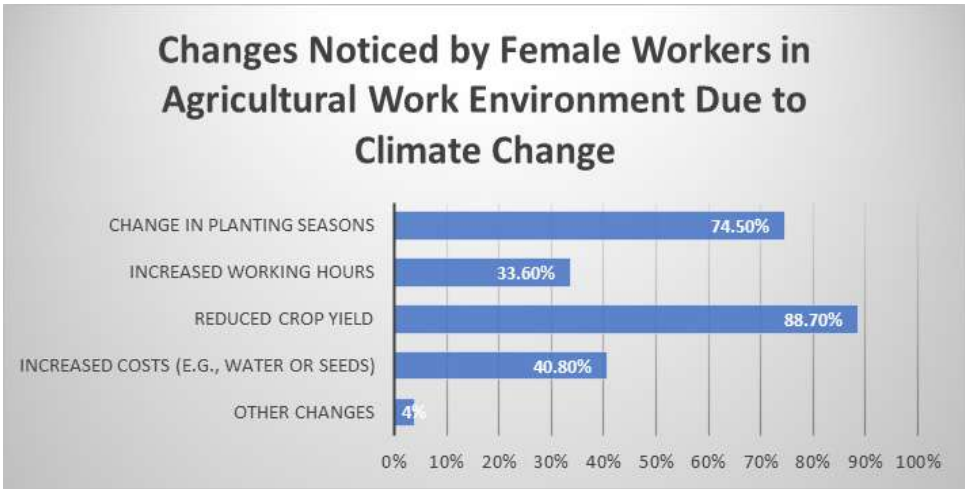

Figure 5 Changes Noticed by Female Workers in Agricultural Work Environment Due to Climate Change

2. Has climate change affected the type of crops or agricultural production you grow?

The responses of the participants were analyzed, and the frequencies and percentages were extracted, with the results summarized in Table 11.

Table 11 Impact of Climate Change on Crop Type or Agricultural Production

Alternatives	Frequency	Percentage
Yes	390	70.1%
No	166	29.9%
Total	556	100%

The data presented in Table 11 indicates the clear impact of climate change on the agricultural sector in Jordan, particularly for women working in this field. The data shows that 70.1% of the workers believe that climate change has affected the quality of crops and agricultural production, while 29.9% feel that it has not had any impact.

According to the testimonies of the female workers, rapid climate changes have led to significant challenges, including rising temperatures that harm traditional crops and increase the demand for water, which has become scarce due to drought. Workers also noted a decrease in the productivity of certain crops, such as tomatoes, which have become more susceptible to spoilage due to high heat.

Additionally, the female workers' testimonies revealed that these changes have forced the cultivation of new crops that are more resilient to harsh climatic conditions, such as drought-tolerant vegetables and those that can withstand higher temperatures. The fluctuating weather has also caused productivity and crop quality to vary, negatively impacting the local market.

On the other hand, the workers mentioned replacing traditional winter crops such as potatoes, carrots, and eggplants with crops that are more suitable for the current climatic conditions. The workers confirmed that delays in rainfall and frost lead to crop damage and delayed productivity. As a result, there has been a shift towards crops such as onions, garlic, and chickpeas, along with increased reliance on greenhouses to extend the growing season.

It also emerged that there have been changes in farming methods to cope with these challenges, such as using hydroponics during times of drought, reflecting the agricultural sector's adaptation to new climatic conditions.

Based on this, it can be concluded that climate change has had a significant impact on the agricultural sector in Jordan, not only in terms of crop quality but also in terms of farming methods and productivity, necessitating further efforts to adapt to these changes and support the women working in this sector.

A female agricultural worker says, "We have started growing new crops that we never used to grow before due to climate changes, such as vegetables that can withstand high heat and drought.

One of the agricultural workers says, "The cold weather destroys the entire crop; it becomes black and is no longer useful." Another one says, "The delay in rainfall and morning frost damages the crops, burns them, turns them yellow, and delays productivity.

3. Do you face difficulty in obtaining the necessary water for farming?

The data has been carefully analyzed to extract frequencies and percentages associated with the responses of the participants, and the results are summarized in Table 12.

Table 12 Access to Water for Agriculture

Alternative	Frequency	Percentage
Yes	243	43.7%
No	149	26.8%
Sometimes	164	29.5%
Total	556	100%

The data in Table 12 indicates significant challenges faced by women workers in the agriculture sector regarding access to the water necessary for their work. The figures show that a large proportion of them, 43.7%, struggle to obtain water, while 26.8% do not face this issue, and 29.5% report facing difficulties occasionally.

These difficulties can be attributed to several main factors, including irregular rainfall or low rainfall levels, which lead to a shortage of available water resources for farming. Additionally, poor infrastructure exacerbates the problem, as many workers rely on traditional methods to access water, such as manual fetching or water collection, which requires extra effort and negatively impacts productivity.

Furthermore, the high demand for water and limited water allocations for farming could be another cause of these difficulties. The rising costs of transporting water from its sources also represent an additional financial burden for the workers. It is important to note that geographical distribution plays a key role in this issue, as some areas are closer to water sources, while others suffer from being far from these resources, further complicating the situation.

4. Did you have to change the type of crops or farming methods due to climate change?

The data was carefully analyzed to extract frequencies and percentages associated with the responses of the participants, and the results are summarized in Table 13.

Table 13 Change in Crop Type or Farming Methods Due to Climate Change

Alternative	Frequency	Percentage
Yes	238	42.8%
No	318	57.2%
Total	556	100%

The data in Table 13 indicates that climate change has had a direct impact on the agricultural practices of women workers. A percentage of them have changed the type of crops or farming methods to adapt to the changing climate conditions. The percentage of workers who made agricultural adjustments is 42.8%, while 57.2% did not make any changes. This disparity reflects economic and financial factors, in addition to a lack of awareness or training for some.

The changes in farming included replacing certain crops with others that are more resilient to harsh climate conditions. For example, tomato cultivation was reduced due to its susceptibility to frost and high temperatures, and it was replaced with hydroponic cultivation or crops like garlic and onions that can tolerate cold and require less water.

Additionally, farming methods for zucchini and beans shifted from traditional methods to greenhouse farming to protect them from frost. Meanwhile, Jute mallow cultivation decreased due to water scarcity, and it was replaced with crops like okra and potatoes.

Women workers indicated that the reasons for change included the impact of frost, water scarcity, and the emergence of agricultural diseases like the fly that harmed citrus crops. These factors led female farmers to choose crops more resistant to drought and frost, such as wheat, onions, and garlic.

These transitions show that women rely on several criteria when choosing new crops, including resilience to harsh climate conditions, low water requirements, and achieving acceptable economic returns. Additionally, using techniques like greenhouses has helped protect some crops from weather factors and improve productivity.

A female agricultural worker says: “We used to grow tomatoes, but their yield decreased and they were affected by the climate, so we started growing them hydroponically.”

Another female agricultural worker says: “We replaced Jute mallow with growing fava beans and okra.”

5. Has climate change affected your occupational health?

The data was carefully analyzed to extract the frequencies and percentages related to the responses of the respondents, and the results are summarized in Table No. (14).

Table 14 Impact of climate change on occupational health

Alternatives	Frequency	Percentage
Yes	253	45.5%
No	303	54.5%
Total	556	100%

The data in Table No. (14) shows the health impacts resulting from climate change on female workers in the agricultural sector in Jordan. The data reveals that 45.5% of the workers have been affected health-wise due to changing climate conditions, while 54.5% have not noticed any direct impact.

These health impacts are due to exposure to harsh working conditions, such as high temperatures, water scarcity, and increased physical effort required. Testimonies from women in the agricultural sector indicate significant effects on their occupational and physical health, with complaints of fatigue and diseases resulting from exposure to harsh working conditions related to weather changes. These impacts are particularly noticeable with the drastic temperature fluctuations, both in winter and summer, along with the spread of diseases related to the agricultural environment. The most common health effects among female workers are:

- Respiratory diseases, including influenza, asthma, pneumonia, and seasonal allergies. These are caused by exposure to severe cold in the early morning hours, inhaling dust from the soil, and air polluted with sulfur and pesticides. One of them says: "Because of the frost and working in the early morning hours, I developed a lung infection, severe respiratory infection, asthma, and sensitivity to the weather." Temperature fluctuations between day and night weaken the immune system, increasing the chances of catching a cold or flu.

- Heat stress and sunstroke: Cases of fainting and nosebleeds occur due to working under high temperatures, which can reach up to 50°C during the summer. One of them says: "Due to the high temperatures, I developed a sensitivity and a sunstroke."

- Muscle and joint problems: Female workers suffer from conditions such as herniated discs, back pain, arthritis, and muscle cramps due to working long hours in uncomfortable positions and carrying heavy loads. One of the workers says: “Going to the farm in the early morning hours exposes us to frost, which leads to colds, flu, and body aches from the cold, and slipping in the mud from the rain, which causes joint pain and disc problems.” Another one explains: “It causes bone problems, leading to herniated discs and stiff limbs. It’s hard to work unless we light a fire to warm up; only then can we start working in the cold. We experience pain in our bones, especially in the feet, back, and hands.”

- Skin diseases: These include skin allergies and rashes caused by direct exposure to pesticides and agricultural fertilizers. One worker says: “We get skin diseases due to sensitivity from trees and insects.” Another confirms: “We suffer from allergies because of exposure to the chemicals used in agriculture.”

- Mental health issues: These include feelings of anxiety, depression, and mental exhaustion due to the difficult working conditions and low income. One worker states: “When we don’t see any production or if the field has no crops due to debts and the cost of water and electricity, I feel exhausted and sick, especially with a continuous cold, cough, and anxiety.” Another one confirms: “It affects our home, our mental state, and our lives.”

▪ Fourth: Social Impacts of Climate Change

1. How has climate change affected your social role within the family or community?

The data was carefully analyzed to extract the frequencies and percentages associated with the responses, and the results were summarized in Table (15).

Table 15 Impact of Climate Change on Female Workers' Social Role within the Family or Community

Statements	Frequency	Percentage	Rank
1. Increased household responsibilities	477	85.8%	1
2. Challenges in balancing work and home	319	57.4%	2
3. Relying on family members for help	276	49.6%	3
4. Other changes	8	1.4%	4

(Multiple choice, N=556)

The data in Table (15) shows the impact of climate change on the social roles of female workers within their families and communities. It appears that climate change has led to increased household responsibilities and health-related duties due to reduced production and income impact. The statistics show that household responsibilities were the most affected, with 85.8%, followed by challenges in balancing work and home at 57.4%, and reliance on family members for assistance at 49.6%, while other changes were reported at 1.4%.

The workers explained that these changes have imposed additional burdens, such as managing household resources more carefully and participating in agricultural work to compensate for the shortage of labor due to high costs. They also pointed out the presence of family tensions and marital disputes resulting from economic pressures and difficult working conditions, which increase the challenges they face in maintaining a balance between their different roles.

These findings highlight the additional burden that female workers bear due to climate change, indicating the need for greater support for them, either through government policies or community programs, to help them adapt to these social and professional challenges.

One of the agricultural workers says: "When there is no production or the production decreases, our situation at home, both financially and mentally, becomes very bad, because my father ends up losing money in the project, and he can't cover the household obligations. We already help him with the work so he doesn't have to hire workers and reduce expenses."

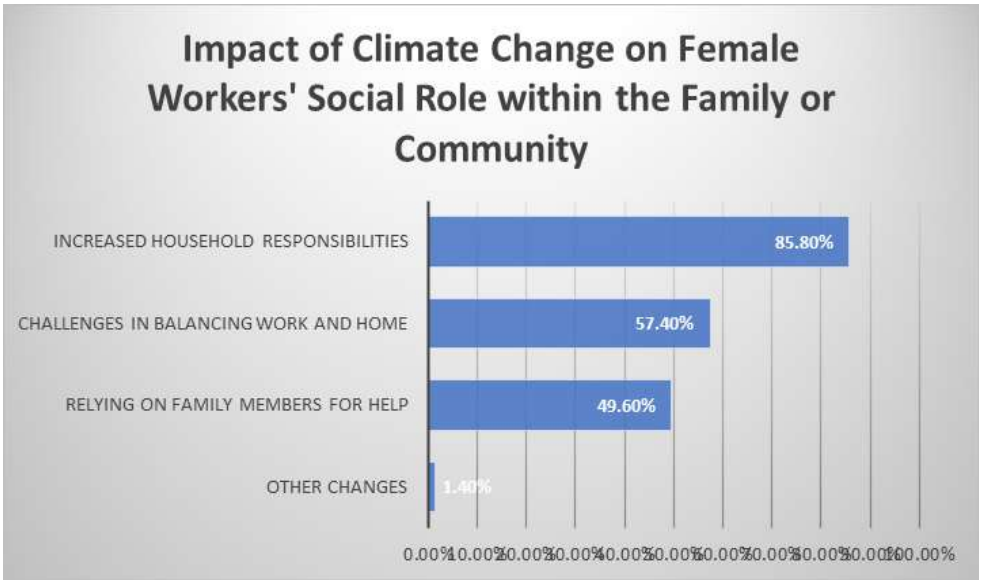

Figure 6 Impact of Climate Change on Female Workers' Social Role within the Family or Community

2. Has climate change altered the social relationships between you and other female farmers?

The data was carefully analyzed to extract frequencies and percentages associated with the respondents' answers, and the results were summarized in Table (16).

Table 16 Impact of Climate Change on Social Relationships Among Female Farmers

Options	Frequency	Percentage
Yes	26	4.7%
No	530	95.3%
Total	556	100%

The data presented in Table (16) indicates that climate change has not significantly affected social relationships among female farmers in Jordan. The vast majority of female farmers, accounting for 95.3%, reported no change in their social relationships as a result of climate change. Conversely, a small percentage of 4.7% believed that climate change had an impact on their social relationships.

This relative stability in social relationships can be attributed to the nature of agricultural communities, which are characterized by strong bonds and close cooperation. Social relationships serve as a fundamental tool for addressing various challenges, including those stemming from climate change. Moreover, the greater focus on tackling the economic and professional challenges posed by climate change may have lessened its impact on social relationships.

As for the farmers who indicated that their social relationships had been affected, they provided a range of opinions explaining how climate changes influenced these relationships. Among the notable opinions was the observation that climate changes reduced social interaction among female farmers due to longer working hours and less time available for communication. One farmer remarked, "We no longer go to work like we used to, and we don't see each other anymore," pointing out that the pressures resulting from climate changes have affected opportunities for meeting and interacting.

In addition, some female farmers pointed out that harsh weather conditions, such as extreme cold in winter or high heat in summer, made social gatherings more difficult. One of them mentioned, 'We stopped seeing each other, especially in the winter,' reflecting the impact of weather conditions on social activities.

On the other hand, some farmers highlighted the existence of competition and conflict over job opportunities due to the scarcity of such opportunities, which negatively affected social relationships among them. One farmer expressed this by saying, 'The challenge among farmers is to get the better job,' while another confirmed, 'There's more competition between farms,' indicating that the difficult economic conditions resulting from climate change have intensified competition among female workers.

Based on the above, it can be said that the impact of climate change on social relationships among female farmers in Jordan remains generally limited but becomes more evident in specific aspects related to increased working hours, harsh weather conditions, and competition for job opportunities.

3. Do you feel sufficient social support from the local community or agricultural associations?

The data was carefully analyzed to extract frequencies and percentages associated with the respondents' answers, and the results were summarized in Table (17).

Table 17 Social Support for Female Workers from Local Community or Agricultural Associations

Options	Frequency	Percentage
Yes	32	5.8%
No	421	75.7%
Sometimes	103	18.5%
Total	556	100%

The data presented in Table (17) highlights a significant challenge faced by female workers in the agricultural sector in Jordan regarding social support. The figures reveal that 75.7% of these workers do not feel they receive adequate support from either the local community or agricultural associations. This high percentage reflects a clear gap in providing the necessary support for this group, which could negatively impact their performance and working conditions, especially given the additional challenges posed by climate change.

On the other hand, only 5.8% of the workers reported consistently receiving social support, a very small percentage that underscores the urgent need for developing effective programs and initiatives aimed at improving the working conditions and psychological and social support for women in this sector. Additionally, the percentage of workers who feel supported occasionally (18.5%) indicates the existence of limited efforts, but these are insufficient to sustainably meet the needs of the workers.

It is, therefore, essential to strengthen the role of agricultural associations and the local community in providing the necessary support for female agricultural workers, whether by allocating additional resources or improving communication channels between the workers and support entities. Efforts should focus on launching comprehensive initiatives aimed at empowering women in agriculture, taking into account the economic, social, and environmental conditions they face, including the impact of climate change, which exacerbates the challenges in this sector.

Improving social support for female agricultural workers is not only about enhancing their working conditions but also contributes to increased productivity and sustainability in the agricultural sector as a whole. This makes it a priority that must be addressed by the relevant stakeholders.

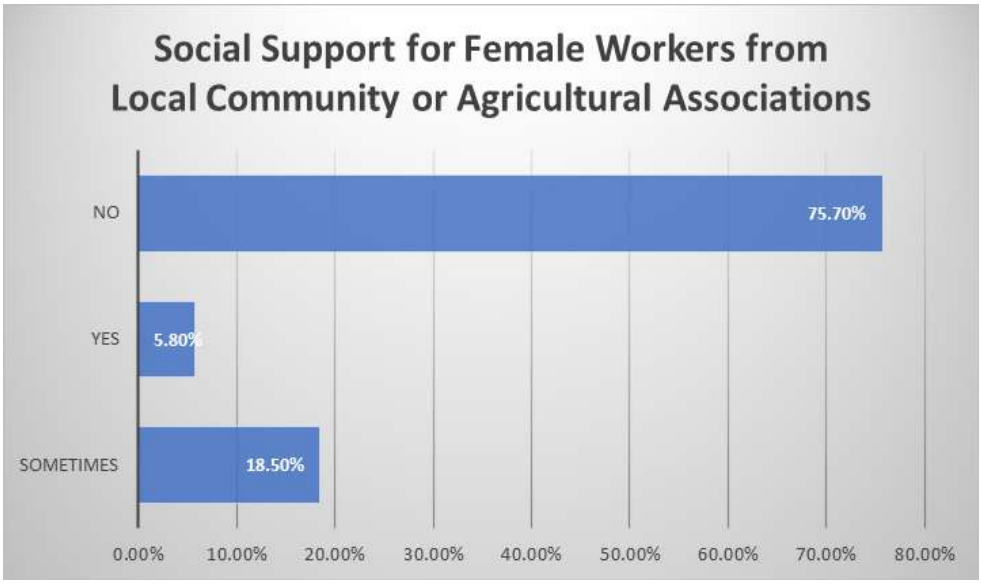

Figure 7 Social Support for Female Workers from Local Community or Agricultural Associations

▪ Fifth: The Economic Impacts of Climate Change

1. Has climate change affected your agricultural income?

The data was analyzed to extract frequencies and percentages associated with the respondents' answers, and the results were summarized in Table (18).

Table 18 Impact of Climate Change on Female Workers' Agricultural Income

Options	Frequency	Percentage
Yes	318	57.2%
No	238	42.8%
Total	556	100%

The data presented in Table (18) highlights the negative economic impacts of climate change on female workers in the agricultural sector in Jordan. The statistics show that 57.2% of respondents reported that their agricultural income was affected by climate change, while 42.8% did not experience a direct impact. These figures reflect a concerning reality about the relationship between climate change and the economic stability of women working in this sector.

There are several reasons for this impact, including decreased productivity caused by higher temperatures, frost, water scarcity, and increased agricultural costs, all of which contribute to reduced financial returns. Testimonials from the workers revealed the extent of these factors on their financial stability. Many reported significant losses due to crop deterioration, which increased costs and reduced revenues. For example, one worker spoke about the difficulty of selling crops due to climate change, leading to accumulated losses. Another highlighted how high summer temperatures hinder work, preventing a steady income.

Additionally, the testimonies pointed out that harsh weather conditions often disrupt work at certain times, reducing daily work opportunities and negatively affecting income. One worker emphasized that extreme heat waves could lead to complete crop destruction, resulting in delayed or reduced wages by employers. Other testimonials mentioned that delayed crop harvests due to weather conditions lead to income shortages and increased financial pressure on farm owners, who are forced to take out bank loans to pay wages, causing further delays in compensating the workers.

These findings shed light on the challenges faced by female workers in the agricultural sector due to climate change and highlight the urgent need for measures to mitigate the negative effects of these changes on agricultural production and income.

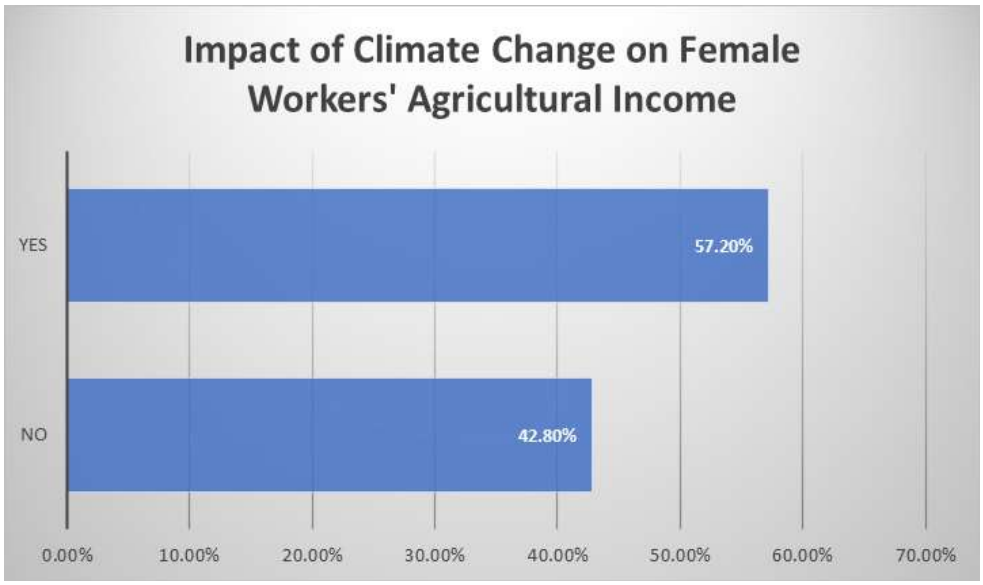

Figure 8 Impact of Climate Change on Female Workers' Agricultural Income

2. What are your strategies for dealing with decreased agricultural income?

The data was carefully analyzed to extract frequencies and percentages associated with the respondents' answers, and the results were summarized in Table (19).

Table 19 Strategies for Dealing with Decreased Agricultural Income

#	Strategies	Frequency	Percentage	Rank
1	Seeking additional work	418	75.2%	1
2	Reducing household expenses	357	64.2%	2
3	Borrowing money	196	35.3%	3
4	Selling assets	52	9.4%	4
5	Other strategies	30	5.4%	5

Multiple choices allowed (N=556)

The data in Table (19) highlights the strategies employed by women working in the agricultural sector to cope with decreased agricultural income. The findings show that seeking additional work is the most common strategy (75.2%), followed by reducing household expenses (64.2%), borrowing money (35.3%), selling assets (9.4%), and adopting other strategies (5.4%).

These strategies reflect the women's efforts to adapt to the difficult economic circumstances resulting from reduced agricultural income and the impacts of climate change. Among these strategies, one prominent approach involves initiating small home-based projects, such as planting potatoes or preparing and selling pastries in local markets or online. Some women also resort to borrowing money from social support networks, such as family and neighbors, to cover emergency expenses.

In addition, some women expand their home-based activities, such as sewing clothes or engaging in handicrafts, to generate extra income that helps meet family needs. One woman noted that working in home sewing became a necessary option to support her family and care for her orphaned nieces and nephews.

On the other hand, government support plays an important role in alleviating the financial burdens on female workers, whether through national aid or agricultural grants. One worker explained that the national aid salary helps cover agricultural production costs. Additionally, some women resort to launching other small projects, such as home grocery shops or offering cleaning services, to improve their financial situation.

These behaviors can be interpreted through the lens of the economic adaptation theory, which suggests that individuals adopt flexible strategies to ensure their basic needs are met when facing income shortages. This approach becomes particularly evident in light of declining incomes and the instability of job security due to climate change. As a result, seeking additional income sources becomes an urgent necessity to achieve financial and economic stability.

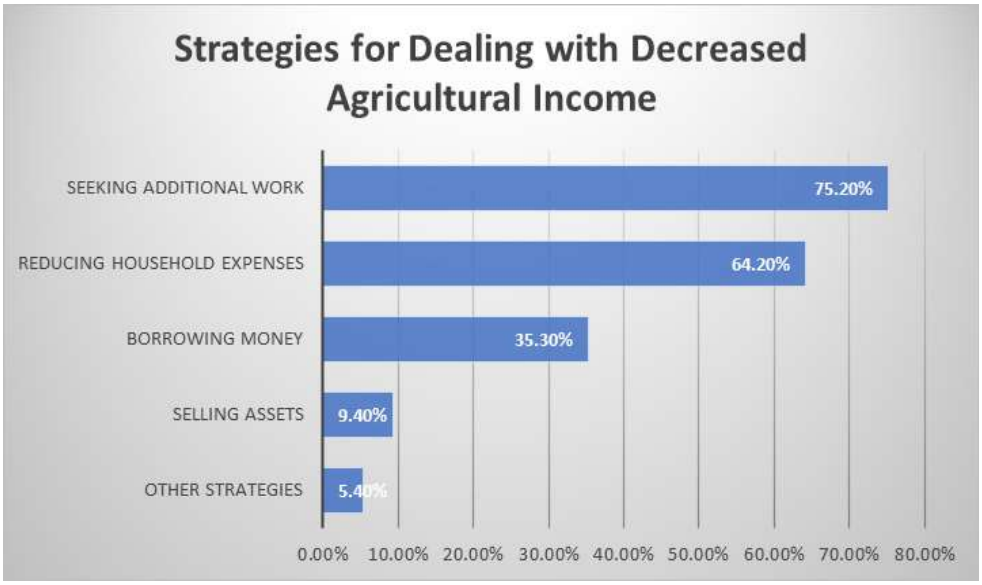

Figure 9 Strategies for Dealing with Decreased Agricultural Income

3. Have agricultural costs increased due to climate change?

The data was carefully analyzed to extract frequencies and percentages associated with respondents' answers, and the results were summarized in Table 20.

Table 20 Increased Agricultural Costs Due to Climate Change

Response	Frequency	Percentage
Yes	230	41.4
No	326	58.6
Total	556	100%

The data in Table 20 indicates that climate change has notable impacts on agricultural costs. A percentage of 41.4% of women working in the agricultural sector reported that climate change has contributed to increased costs, while 58.6% believed it had no direct effect on rising costs. However, detailed testimonies from the women highlight the significant economic challenges imposed on farmers by climate change.

One of the primary reasons for the increased agricultural costs associated with climate change is the need to purchase plastic greenhouses to protect crops from frost and high temperatures. These greenhouses, as one worker mentioned, are "very expensive." Additionally, the prices of fertilizers and pesticides have sharply increased, further burdening farmers financially. The scarcity of rain has also forced farmers to purchase water for irrigation, adding another layer of costs.

Testimonies also revealed that delayed rainfall has led to an increase in pests and agricultural insects, requiring intensive use of pesticides to combat these issues. As one worker explained, "We need pesticides to kill worms because of the delayed rain." This situation has compelled farmers to incur additional expenses for replanting using new seedlings, seeds, and fertilizers after crops were damaged.

Moreover, climate changes have impacted the growth of natural grass, leading to a shortage of natural fodder and forcing farmers to rely on expensive commercial feed. The costs of veterinary medicines needed to maintain animal health have also increased.

Costs associated with modern technologies, such as electric sprayers and advanced irrigation systems, have risen due to water scarcity, making these technologies essential to ensure the continuity of agricultural production.

Based on the above, it can be concluded that climate change poses a significant economic challenge for farmers, requiring them to bear multiple additional costs, including crop protection, pest control, water provision, and the use of modern technologies.

4. Have you received financial or technical support to address the effects of climate change?

The data was carefully analyzed to extract frequencies and percentages associated with respondents' answers, and the results were summarized in Table 21.

Table 21 Receiving Financial or Technical Support to Address Climate Change Impacts

Response	Frequency	Percentage
Yes	13	2.3
No	543	97.7
Total	556	100%

The data indicates a lack of financial and technical support provided to women agricultural workers to address the effects of climate change. A very large proportion of the workers (97.7%) reported not receiving any type of support, compared to a very small percentage (2.3%) who received limited and often unsustainable assistance.

Some workers stated that they had received minimal support from various entities. For instance, one worker mentioned receiving a grant to purchase a sewing machine for a home-based project, along with training courses. Another worker reported receiving financial support of 70 Jordanian dinars over three years from an organization to support agricultural projects; however, this support ceased by the end of 2020.

Additionally, some farmers noted receiving modest compensation from the Ministry of Agriculture, such as irrigation equipment or pesticides, but these were neither sustainable nor sufficient to meet their needs. One worker mentioned that the ministry provided her employer with irrigation equipment ("hoses for irrigation") but did not continue providing this support.

Other workers highlighted support from agricultural associations or social welfare programs, but this assistance did not cover all their needs. Conversely, some women reported bearing additional costs themselves, such as purchasing personal protective equipment like gloves to cope with harsh working conditions.

These findings reflect the scarcity of initiatives aimed at supporting women in agriculture to adapt to climate change, whether from government agencies, agricultural associations, or non-governmental organizations. They also point to a significant gap in providing the tools and resources necessary to help female farmers improve their ability to face the challenges posed by climate change.

▪ Sixth: Psychological Effects of Climate Change

1. How has climate change affected your psychological state?

The data was carefully analyzed to extract the frequencies and percentages associated with the respondents' answers, and the results were summarized in Table 22.

Table 22 Impact of Climate Change on Female Workers' Mental Health

Statement	Frequency	Percentage	Rank
Worry about the future	449	80.8%	1
Feeling of fatigue and exhaustion	433	77.9%	2
Feeling frustrated due to low production	347	62.4%	3
Other effects	9	1.6%	4

Multiple choice (N=556)

The data in Table 22 indicates the psychological effects of climate change on women working in the agricultural sector in Jordan. The most prominent effect is worry about the future, which topped the list of impacts with 80.8%. This was followed by a feeling of fatigue and exhaustion at 77.9%, and feelings of frustration due to low production at 62.4%. Other effects were noted by 1.6%, including increased psychological stress from daily challenges and feelings of sadness.

These results suggest that climate change exacerbates both psychological and physical stress on women in the agricultural sector, especially as their families depend on this sector as their primary source of income. Among the factors contributing to this stress is the rise in temperatures, which increases physical exhaustion. One worker mentioned that the high cost of water limits her ability to expand farming, adding an additional burden to her psychological state.

Additionally, there are concerns about the impact of climate change on the continuity of agricultural work, including the migration from traditional farmlands to modern farming techniques such as greenhouses, which require fewer workers. This shift may reduce the available job opportunities for women, increasing their anxiety about the future.

These psychological effects can be explained by the challenges associated with unpredictable weather changes, resource scarcity, and fluctuating harvest seasons. These factors lead to an increasing sense of uncertainty regarding the economic and social stability of the workers. Furthermore, the nature of the strenuous work in the agricultural sector and the adaptation to changing environmental conditions contribute to heightened levels of exhaustion and psychological stress, negatively affecting the mental and emotional health of the workers.

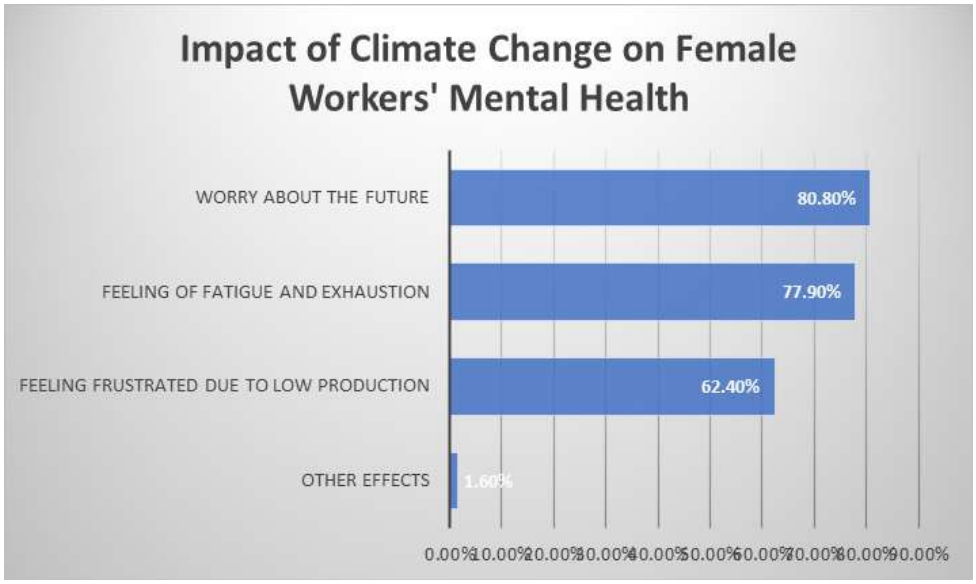

Figure 10 Impact of Climate Change on Female Workers' Mental Health

2. Do you feel that you are receiving the necessary psychological or emotional support to cope with these challenges?

The data was carefully analyzed to extract the frequencies and percentages associated with the respondents' answers, and the results were summarized in Table (23).

Table 23 Psychological or Emotional Support Available to Female Workers in Agriculture

Response	Frequency	Percentage
Yes	106	19.1%
No	379	68.1%
Sometimes	71	12.8%
Total	556	100%

The data in Table (23) highlights an important issue concerning the reality of women in the agricultural sector in Jordan, showing that the majority of women do not feel they are receiving the necessary psychological or emotional support to cope with the challenges posed by climate change. The percentage of those not receiving this support was 68.1%, while only 19.1% reported feeling that they received the required support, and 12.8% received it intermittently.

This reality can be explained by several interconnected factors. First, there is a clear lack of awareness about the importance of psychological support as part of strategies to deal with environmental and social challenges. Community efforts and agricultural associations often focus on providing financial and technical support, neglecting the psychological aspects that are essential for ensuring the sustainability of agricultural work and enhancing the well-being of female workers. Second, rural and agricultural areas suffer from weak infrastructure for mental health services, making access to these services difficult. This lack of infrastructure exacerbates the problem and leaves the workers without sufficient support resources. Third, traditional social roles play a significant part in reinforcing this situation, where psychological support is not seen as a pressing priority, especially for working women. This traditional outlook contributes to the diminished importance of providing psychological support within the agricultural work system.

Finally, economic issues such as improving productivity and reducing losses are typically given priority, which relegates psychological support to a secondary position. Additionally, there is a lack of awareness and training programs that educate female workers about the importance of psychological support and how to access it.

3. Do you believe that climate change has affected your ability to make decisions related to agriculture or family?

The data was analyzed to extract the frequencies and percentages associated with the respondents' answers, and the results were summarized in Table (24).

Table 24 Impact of Climate Change on Decision-Making Regarding Agriculture or Family

Response	Frequency	Percentage
Yes	139	25%
No	417	75%
Total	556	100%

The data in Table (24) indicates the impact of climate change on the ability of women working in agriculture to make decisions related to agriculture and family. The results show that one-quarter of the respondents (25%) feel that climate change has affected their decisions, while the majority (75%) did not notice a significant impact.

Women in the agricultural sector confirmed that climate changes, such as frost and rising temperatures, significantly impact their decisions related to agricultural work. These challenges lead to hesitation in decision-making, and some even consider leaving agricultural work, but economic conditions force them to continue. One worker mentioned that the burden of responsibility and the pressure she feels drive her to think about leaving farming.

The responses clarified that climate change leads to a decline in agricultural production, which negatively affects family expenses and reduces spending on basic needs. Additionally, delayed wages or insufficient income lead some women to consider transitioning to other professions, although agriculture remains the only available option for them.

Female workers also experience frustration and fear of losses associated with the effects of climate change, which leads to reducing the size of agricultural projects or changing the crops grown. The accumulation of debts and reduced income increases psychological and financial pressures, prompting some of them to cut household expenses and save to meet family needs.

These impacts can be explained by the fact that climate change exerts direct pressures on production and costs, making the decision-making process more complicated. However, the larger percentage of women who did not feel an impact on their decision-making ability may reflect greater resilience or additional support from their family or community, which alleviates the severity of climate impacts.

▪ Seventh: Recommendations and Solutions

1. What solutions do you think could help you face climate change?

The data was carefully analyzed to extract frequencies and percentages associated with the responses of the surveyed participants, and the results were summarized in Table (25).

Table 25 Solutions Female Workers Believe Can Help Address Climate Change

#	Statement	Frequency	Percentage	Rank
1	Training in modern agricultural techniques	401	72.1%	2
2	Providing direct financial support	492	88.5%	1
3	Improving access to agricultural resources	268	48.2%	3
4	Improving irrigation systems	218	39.2%	4
5	Other solutions	9	1.6%	5

Multiple choice (N=556)

The data reveals that women in the agricultural sector face significant challenges due to climate change and propose a range of solutions to mitigate these changes and improve productivity and sustainability in agricultural work.

The most prominent solution highlighted is the provision of direct financial support, which is considered the top priority by 88.5% of respondents. This support would allow farmers to cover essential costs such as agricultural supplies, energy, and water, and could also be used to invest in improving productivity.

The second solution is training in modern agricultural techniques, with 72.1% of respondents supporting this measure. This reflects the importance of enhancing the knowledge and skills of workers to implement more efficient and sustainable agricultural practices. This training contributes to improving production, reducing waste, and better resource utilization, making it a strategic long-term tool. Improving access to agricultural resources came in third place, with 48.2% of respondents highlighting this solution, followed by improving irrigation systems at 39.2%. These solutions emphasize the importance of improving agricultural infrastructure to ensure the continuity of work and increase efficiency.

Additionally, other solutions were suggested by 1.6% of the participants, such as alleviating the burdens of agricultural loans and the associated interest, as this represents a significant burden for farmers, especially when insufficient returns are generated to cover costs. It was also emphasized that support should be provided to farmers to improve the production cycle and to restart factories to transform surplus crops into products that can be stored or sold.

The importance of supporting additional projects, such as recycling, was highlighted as well. These projects could create new opportunities to benefit from agricultural waste and provide additional income. Furthermore, the need for modern agricultural equipment such as solar-powered greenhouses and advanced cooling devices was emphasized, as these can reduce the impact of climate change on production.

Workers also pointed out the necessity of providing permanent job opportunities outside the agricultural sector to secure a stable income for households and reduce dependence on agriculture alone. There was also a suggestion to offer subsidized pesticides to ensure crop protection without placing additional financial burdens on farmers. Lastly, the importance of expanding the use of hydroponics as an innovative solution to address water scarcity and increase resource efficiency was stressed.

Through these suggestions, it is clear that women workers in agriculture recognize the importance of combining financial and technical support with infrastructure to improve the sustainability of the agricultural sector and effectively address the challenges of climate change.

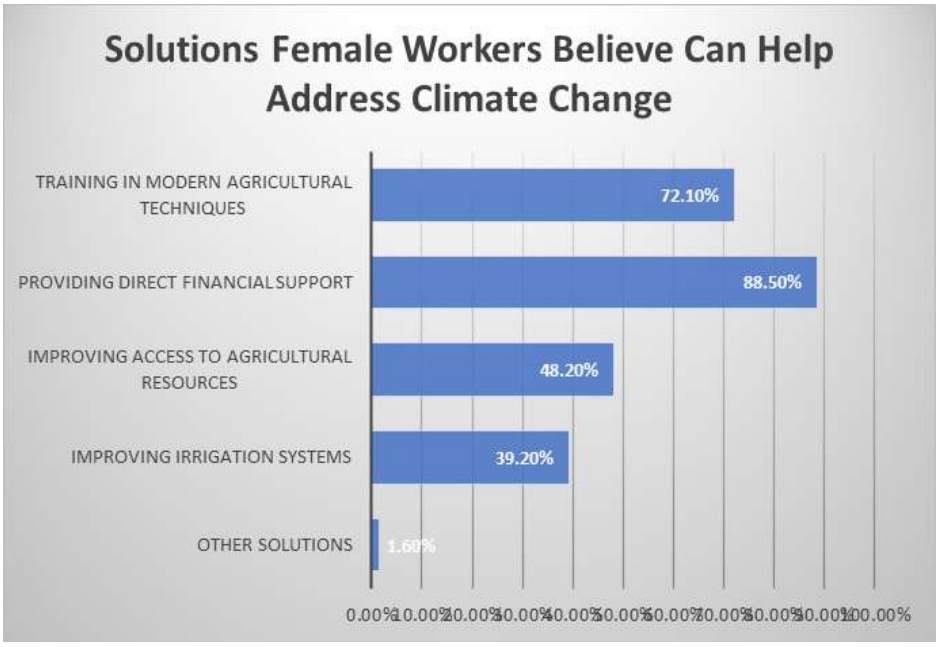

Figure 11 Solutions Female Workers Believe Can Help Address Climate Change

2. Would you like to participate in training programs or workshops to develop your agricultural skills?

The data was carefully analyzed to extract the frequencies and percentages associated with the respondents' answers, and the results were summarized in Table No. (26).

Table 26 Willingness to Participate in Training Programs or Workshops to Develop Agricultural Skills

Option	Frequency	Percentage
Yes	489	87.9%
No	67	12.1%
Total	556	100%

The data in Table No. (26) indicates that the majority of women working in agriculture show a clear interest in participating in training programs and workshops aimed at developing their agricultural skills, with 87.9% expressing a desire to participate. This high percentage reflects the workers' awareness of the importance of these programs in improving their skills, increasing productivity, and enhancing their ability to face growing challenges such as climate change.

On the other hand, a small percentage of workers (12.1%) did not express a desire to participate. This could be due to several factors, such as a lack of awareness about the benefits of these programs or the perception that the costs and time required to participate may pose an additional burden. There may also be doubts about the effectiveness of these workshops in achieving tangible improvements in agricultural performance.

Based on these results, it is recommended to intensify efforts to raise awareness among the workers about the importance of these programs through awareness campaigns that highlight the practical benefits and positive impact of these workshops on agricultural productivity. Additionally, providing financial support or offering incentives to encourage participation and reduce potential burdens could also be considered.

3. What message would you like to convey to the responsible authorities to help you cope with the effects of climate change?

The message that can be conveyed to the responsible authorities to assist farmers in coping with the impacts of climate change includes several key areas aimed at enhancing the resilience of the agricultural sector and improving the working and living conditions of farmers, especially in light of the increasing climate challenges. Below are the main recommendations that can be provided based on the responses from the participants:

1. Financial and Material Support

- The need to provide direct financial support to compensate farmers for losses resulting from climate changes such as droughts, floods, or heat waves.
- Offering low-interest loans to support small agricultural projects, which helps improve productivity and the sustainability of agricultural activities.
- Providing financial assistance to purchase agricultural production supplies such as seeds, fertilizers, and modern agricultural tools.

2. Training and Guidance

- Organizing specialized training courses on modern farming techniques and those that help adapt to climate change, such as using modern irrigation systems or growing drought-resistant crops.
- Offering advisory services to farmers to improve productivity and reduce losses, with a focus on sustainable solutions.
- Raising awareness among farmers about the importance of sustainable agriculture and ways to deal with changing climatic conditions.

3. Enhancing Agricultural Infrastructure

- Establishing plastic houses to protect crops from harsh weather conditions, such as frost or extreme heat.
- Improving irrigation systems and providing water sustainably through techniques such as drip irrigation or rainwater harvesting.
- Supporting the establishment of modern agricultural projects aimed at empowering female farmers and households working in the agricultural sector.

4. Improving Working Conditions

- Raising wages for workers in the agricultural sector to align with the effort and working conditions.
- Improving the work environment by providing safety equipment and reducing the risks associated with agricultural labor.
- Integrating workers and farmers into health insurance and social security programs to ensure their livelihood stability.

5. Moral and Social Support

- Providing psychological and moral support to female farmers, especially in remote areas that suffer from a lack of services.
- Strengthening the role of women in the agricultural sector by supporting their own projects and offering training programs aimed at economic and social empowerment.
- Encouraging the establishment of home-based agricultural projects that contribute to improving the income of rural families.

6. **Government Actions and Initiatives**

- Establishing clear policies to compensate farmers affected by climate disasters, such as creating an emergency fund to support the agricultural sector.
- Conducting regular field visits to assess the damage on the ground and provide direct and timely support.
- Launching government initiatives aimed at supporting sustainable agriculture and encouraging innovation in the agricultural field to address climate challenges.

Second: Results of the Observation Tool

Field visits were conducted to the Jordan Valley areas to study and analyze the working conditions faced by women in the agricultural sector, focusing on the impact of climate change on their daily productivity. Six diverse field visits were carried out, including direct monitoring of daily tasks and documentation of observations related to the surrounding environment and working conditions.

The results obtained from these visits highlighted several key areas that underscore the challenges faced by women in this sector, including the nature of the strenuous work, the impact of climate changes on agricultural production, as well as the adverse environmental conditions that increase the difficulty of daily tasks.

Several key areas were identified based on the observations:

1. **Lack of Safety Equipment**:

Women workers in the farms of the Jordan Valley face significant challenges due to the lack of professional safety equipment, which is essential in any work environment. The absence of this equipment exposes them to various risks, as they resort to primitive and ineffective methods such as wrapping cloths around their heads to protect themselves from the scorching sun or using old medical gloves that do not provide adequate protection. As a result, the likelihood of recurring injuries, including cuts, sunburns, and insect bites, increases, adding additional burdens to their daily lives. Despite the issuance of the "Guidelines for Occupational Safety and Health in Agricultural Worksites" by the Ministry of Labor in 2021, which outlines the necessary practices and procedures to ensure worker safety in the agricultural sector, the lack of proper safety measures continues to be a major concern.

2. Health and Occupational Injuries:

Agricultural workers in Jordan face numerous health risks despite the existence of regulations aimed at protecting workers from injuries in the workplace. Among the most prominent of these risks is persistent nose bleeding (epistaxis) caused by dehydration and working under the scorching sun without adequate water intake. This dehydration weakens the mucous membranes, making them more susceptible to bleeding.

Additionally, prolonged and direct exposure to sunlight leads to skin issues, such as sunburn and pigmentation, and can escalate to more serious skin diseases. The use of chemicals for pest control also increases the likelihood of skin allergies or chronic skin infections, especially if protective measures such as gloves or masks are not used.

The risks are not limited to these, as workers are also exposed to insect stings, which can be painful and may lead to infections or allergic reactions, further increasing their suffering while working.

3. Unsafe Transportation:

The transportation used to take workers to their workplaces poses a significant risk to their safety and lives. One of the main issues they face is the use of open “pickup” trucks, where workers are placed in the back without any protection or safety equipment. This situation exposes them to serious injuries in the event of an accident on the road.

Additionally, workers suffer from inhumane conditions during transit, especially in the summer, as the vehicles are not air-conditioned, which increases their suffering under high temperatures. These harsh conditions make the commuting experience physically and mentally exhausting.

Tamkeen has documented several tragic incidents that resulted in the death of agricultural workers due to the lack of safe transportation options.

4. Absence of Sanitary Facilities:

The lack of sanitary facilities at workplaces represents a significant challenge that directly affects the health and comfort of female workers. This situation forces many of them to reduce their fluid intake to avoid the need to use inadequate or nonexistent facilities, leading to health issues such as dehydration and urinary tract infections. Additionally, the absence of these facilities leaves a negative psychological impact, as workers feel embarrassed and uncomfortable, which affects their productivity and performance at work.

Through field visits, Tamkeen has documented numerous workplaces suffering from the lack or absence of sanitary facilities. The organization also listened to testimonies from workers who confirmed that this deficiency represents a daily challenge for them.

5. Verbal Abuse:

Many female workers in farms face significant challenges related to mistreatment, particularly verbal abuse from employers or supervisors, which negatively affects their mental well-being. This abuse includes yelling and reprimanding, even during short breaks of no more than 10 minutes, which barely provide enough time to recharge. This environment, filled with tension and psychological stress, makes it difficult for workers to focus and be productive, in addition to its negative impact on their mental and physical health.

6. Stray Dog Threat:

The presence of stray dogs at work sites poses a major safety challenge for female workers, increasing their daily fears, especially during the early hours of work when movement is limited and lighting is sometimes poor. Multiple cases have been recorded where female workers were attacked by these dogs, highlighting the dangerous nature of this situation for workers while performing their daily tasks.

7. Harsh Working Conditions and Low Wages:

Many female workers suffer from difficult and inhumane working conditions, facing daily challenges ranging from harsh weather to meager wages that are insufficient to meet their basic needs. They work long hours starting early in the morning, often in exhausting and strenuous conditions. The daily wage of no more than 6 dinars reflects a difficult economic reality, where these workers find themselves trapped in a cycle of poverty and financial instability. This situation not only affects their daily lives but also contributes to their feelings of frustration and hopelessness regarding the improvement of their living conditions.

8. Child Labor:

Field observations in the farms reveal the reality of child labor, with children under the age of eighteen regularly working. One such case involved a 15-year-old child who had to leave school after the fourth grade due to the economic pressures facing his family. This child works daily for up to seven hours to provide additional income to help meet his family's basic needs. This phenomenon highlights the deep impact of poverty on children's futures, as they are forced to abandon education—which is a fundamental right and a means of breaking the cycle of poverty—and engage in physically and mentally demanding work beyond their capacity.

9. Public Life Conditions:

The daily life of female workers in the Jordan Valley represents an ongoing challenge that extends beyond the long working hours, as they face difficult living conditions that add to their psychological and financial burdens. Frequent water and electricity outages due to the accumulation of monthly bills have become common in most households, placing them in a situation of dual hardship, where they must provide for their families' basic needs amidst a clear lack of adequate government support.

Third: Results of the Interview Tool

Interviews were conducted with a number of female workers in the farms of the Jordan Valley to understand the challenges facing the agricultural sector, the impact of climate change on agricultural production, as well as to explore the working conditions and various challenges these workers face. The study focused on understanding the effect of farm work on their personal lives and the impact of climate change on agricultural production in Jordan. The results obtained from the study will be presented by showcasing the main topics of the interview tool and the responses of the interviewees, which were analyzed qualitatively.

1. **Challenges Facing the Agricultural Sector in Jordan**

Regarding the challenges faced by the agricultural sector in Jordan due to climate change, interviews with female workers in this sector revealed a range of difficulties that directly affect productivity. These challenges can be summarized in the following points:

- **Lack of awareness about the impacts of climate change:** The interviewees showed that there is a lack of awareness regarding the impacts of climate change on the agricultural sector, especially in affected areas like the Dead Sea. Some workers feel that climate change is not a priority topic in agricultural training or government programs, which exacerbates the crisis of being unprepared for environmental changes.

- **Decrease in agricultural production due to climate change:** Rising temperatures and drought in some areas have led to a reduction in available crops, resulting in a decline in agricultural revenues. This has caused a reduction in the ability to cover agricultural costs such as fertilizers, pesticides, and labor.

- **Since the agricultural sector in Jordan heavily relies on manual labor**, any changes in agricultural production indirectly affect female workers in terms of working hours, wage conditions, and the ongoing challenges of working in harsh environmental conditions.

- **Lack of government support:** The agricultural sector in Jordan suffers from a significant lack of government support, particularly when it comes to providing solutions for adapting to climate change. According to the interviewees, government programs directed at farmers often do not include strategies specifically tailored to support female workers.

2. The Impact of Climate Change on Agricultural Production in Jordan

Through interviews with female workers and focus group discussions, it was revealed that climate change has had significant effects on agricultural production in Jordan, including:

- **Land Degradation:** The rise in temperatures and drought conditions affecting many agricultural areas in Jordan, such as the regions around the Dead Sea, have led to noticeable land degradation. Farmers are no longer able to use the land as effectively as before, resulting in a decline in soil quality and reduced capacity to produce crops as they did previously.
- **Impact of Rainfall Changes:** Significant changes in rainfall patterns have been recorded, which have greatly affected the amount of water available for irrigating crops. In recent years, farmers have faced fluctuations in rainfall seasons, leading to reduced agricultural yields for crops that depend on specific rainfall periods.
- **Increase in Pests and Agricultural Diseases:** Climate changes have contributed to an increase in the appearance of agricultural pests and diseases affecting crops. This has led to greater use of pesticides and chemicals, which has impacted the quality of agricultural produce and increased operational costs.
- **Water Shortages:** The issue of water scarcity is one of the biggest challenges facing the agricultural sector in Jordan due to the scarcity of water resources. Female farmers find it difficult to obtain the necessary water to irrigate crops, which often leads to the deterioration of agricultural production.

3. The Impact of Climate Change on Female Workers in the Agricultural Sector

Climate change has had profound effects on female workers in the agricultural sector. These impacts can be divided into several economic, social, legal, and health aspects, as follows:

1. Economic Impacts:

- **Decline in Revenues:** Climate change has significantly reduced agricultural production, which has reflected on the income of female workers. With reduced crop yields, it has become difficult for workers to earn enough to cover living costs. Working hours have also decreased, which directly impacted their wages.
- **Increased Financial Burdens:** Farmers, including female workers, face higher agricultural costs due to the need to use additional techniques such as artificial irrigation and pesticides. These increased costs have affected their ability to continue working in agriculture.

2. Social Impacts:

- **Work Pressure:** According to the interviews, female workers in the agricultural sector face social pressures due to climate change. They have been forced to work longer hours in harsh weather conditions, which has affected their work-life balance.
- **Social Discrimination:** It has been observed that female workers in the agricultural sector face social discrimination and struggle to receive social support from the surrounding community. The challenging working conditions contribute to negative perceptions of these workers, increasing their social challenges.

3. Legal Impacts:

- **Lack of Legal Protection:** One of the major challenges faced by female workers is the absence of legal protection for their rights in agricultural work. Many work in unregulated conditions and do not benefit from the appropriate social or legal protections.
- **Lack of Recognition of Labor Rights:** Female workers do not receive sufficient guarantees regarding their basic rights, such as health insurance or fair wages. This is attributed to the absence of necessary legislation to protect their rights in the workplace.

4. **Health Impacts and Occupational Safety:**

- **Health Risks:** Female workers in the agricultural sector face numerous health risks due to high temperatures, air pollution, and continuous exposure to chemicals and pesticides. The harsh working conditions also contribute to skin and respiratory diseases.

- **Workplace Safety:** The working environment in the agricultural sector in Jordan typically does not provide the necessary safety precautions, exposing female workers to risks while performing their tasks. These risks include accidents from agricultural equipment or exposure to work-related diseases in unsafe conditions.

- **Lack of Social Support Programs:** Interviews with female workers revealed a significant lack of social support programs directed at them. They lack health insurance or financial guarantees in case of emergencies, which puts them at risk given the climate changes affecting agricultural work. The workers noted that the current government support does not fully meet their needs.

Conclusions:

In the study on the impact of climate change on female agricultural workers in Jordan, three research tools were used: interviews, observations, and surveys. The data extracted from each tool was analyzed separately and then combined to form a comprehensive picture of the challenges faced by female workers in the agricultural sector. This section will provide an integrated analysis that combines the results from all three tools.

First: Climate Challenges and Their Impact on Agricultural Production:

1. Interviews conducted with female workers in the Jordan Valley farms revealed a noticeable deterioration in agricultural production due to climate change. The most prominent challenges identified were high temperatures and drought, which led to a decline in crop yields. Additionally, there was an increase in agricultural pests and the spread of diseases, which, in turn, resulted in lower agricultural revenues, directly affecting the income of the female workers.

2. Through observation, tangible effects of climate change on the agricultural work environment were recorded, where female workers spent longer hours in harsh climatic conditions (such as very high temperatures), leading to increased physical exhaustion and psychological stress. It was also observed that the quality of harvested crops was poor, which impacted the amount of work and completion times.

3. The survey indicated that most of the workers lacked sufficient awareness of the impact of climate change on the agricultural sector. The majority confirmed that climate change was not a priority topic in the training they received. Additionally, responses highlighted increasing difficulty in accessing water and a lack of agricultural resources due to these changes.

All the tools indicate that climate change significantly contributes to the decline in agricultural production in Jordan, and this effect is reflected in the lives of the workers. While the interviews provide direct personal details about the effects of heat and drought, observations emphasize environmental impacts and daily work, and the survey adds information on awareness and preparedness to deal with these challenges.

Second: Economic Impact on Female Workers:

1. Regarding economic aspects, interviews revealed that the decline in agricultural production led to decreased income and increased financial pressures on female workers. It became difficult for them to meet their daily needs due to the reduced harvests, negatively impacting their financial stability.

2. Through observation, it was recorded that long working hours in harsh conditions affected the physical and psychological endurance of female workers. It was also noted that fatigue levels increased among workers due to rising agricultural costs and the use of more expensive techniques such as artificial irrigation.

3. Responses from the survey showed that many female workers face difficulties in meeting their living needs due to decreased income resulting from climate change. A large percentage of them agreed that the rising costs of agriculture, due to the use of modern techniques and methods to mitigate the effects of climate change, increase their financial burden.

All three tools agree that the economic impacts of climate change directly affect the income of female workers. The interviews show the sharp decline in agricultural revenue affecting daily income, observations confirm the physical and psychological pressures resulting from extended working hours, and the survey reveals financial challenges arising from increased agricultural costs.

Third: Social and Legal Impacts:

The interviews indicated that female workers face social discrimination due to their work in the agricultural sector, where attitudes reveal that society does not recognize the importance of the agricultural work done by women, but instead views them negatively. Female workers also confirmed that the lack of legal protection leads to their suffering from a lack of social support during difficult times.

Observation also showed that female workers work in an unregulated environment that does not guarantee them legal or social protection. It was found that working in the farms of the Jordan Valley suffers from wage disparities and the absence of health insurance.

Meanwhile, the survey revealed that most female workers do not receive their full labor rights, including health and financial guarantees. The results also showed that a lack of

awareness of legal rights contributes to the exacerbation of these problems. Many workers reported working in unregulated conditions regarding wages and the lack of suitable employment opportunities for them.

All three tools agree on the significant gap in labor rights and legal protection for female workers in the agricultural sector. The interviews show how workers suffer from social discrimination and lack of government support, while observation highlights the risks of working in an unsafe environment. The survey clearly reveals missing rights, such as health insurance and fair wages.

Key Findings

The following are the key findings of the study:

1. The results showed that the majority of female workers in agriculture in Jordan are involved in crop farming (99.1%), followed by livestock farming (6.1%), and food processing (1.8%).

2. The results revealed that more than half of the female workers in the agricultural sector in Jordan work on farms owned by others, with (82.7%) working on such farms, compared to (6.7%) who own and manage their own farms.

3. The results showed that more than half of the female workers in the sector have heard of the concept of climate change, but their knowledge is limited, with (72%) being aware of it, while (27.3%) have a good understanding of climate change.

4. The results revealed that female workers in the agricultural sector primarily rely on practical experience to obtain information about climate change (61.9%), followed by media sources (43.3%).

5. The results showed that female workers in the agricultural sector in Jordan are aware of the impact of climate change on agriculture, with (92.3%) of them being aware of this impact.

6. The results showed that the most noticeable climate change impacts observed by female workers in agriculture are rising temperatures (91.9%), followed by changes in rainfall patterns (73.9%).

7. The results revealed that female workers in the agricultural sector believe that climate change is linked to a decline in their agricultural productivity (88.3%).

8. The results indicated that more than half of the female workers in agriculture are unaware of modern agricultural techniques that help mitigate climate change (53.4%).

9. The results showed that climate change has significantly impacted the agricultural work environment, with female workers observing a decrease in crop production (88.7%) and a change in the planting season (74.5%).

10. The results revealed that (43.7%) of female workers in the agricultural sector face

difficulty in accessing the water needed for farming.

11. The results showed that more than (42.8%) of female workers in the agricultural sector have changed the type of crops or farming methods in response to climate change.

12. The results showed that climate change has increased household responsibilities for female agricultural workers by (85.8%), and has caused challenges in balancing work and home life for (57.4%).

13. The results revealed that climate change has not significantly affected social relationships among female agricultural workers, with the vast majority (95.3%) reporting no change in their social relationships.

14. The results showed that the majority of female workers in the agricultural sector in Jordan do not feel adequate social support from the local community or agricultural associations, with (75.7%) expressing this sentiment.

15. The results indicated that climate change has significantly impacted the income of female workers in the agricultural sector in Jordan, as reported by (57.2%) of the respondents.

16. The results revealed that female workers' strategies for dealing with reduced agricultural income include seeking additional work, with (75.2%) adopting this approach.

17. The results showed that the vast majority of female workers in the agricultural sector did not receive any financial or technical support to address the impacts of climate change, with (97.7%) reporting this.

18. The results revealed that climate change contributed to a sense of anxiety about the future for (80.8%) of workers, and led to feelings of exhaustion and fatigue for (57.4%).

19. The results showed that a quarter of respondents (25%) felt that climate change affected their ability to make decisions related to agriculture or family matters.

20. The results revealed that female agricultural workers believe that providing direct financial support is the best solution to address climate change, with (88.5%) supporting this, followed by training on modern agricultural techniques. The results

also showed that the majority of female agricultural workers in Jordan wish to participate in training programs or workshops to enhance their agricultural skills, with (87.9%) expressing this interest.

21. Cases of child labor in the farms were regularly observed, reflecting the economic challenges faced by their families. For example, a 15-year-old boy had left school to work on the farm, relying on the income to support his family.

22. The lack of occupational safety equipment in the farms was noted, forcing female workers to use temporary and ineffective solutions to protect themselves from health hazards, such as cuts, sunburns, and insect bites.

23. Numerous work-related injuries were observed on the farms, such as nosebleeds caused by dehydration, skin injuries due to sun exposure, and insect bites. Additionally, female workers are increasingly exposed to chemicals due to agricultural pests caused by climate change.

24. Female workers face difficulties with unsafe and unairconditioned transportation, which exposes them to risks and increases their suffering while traveling in hot weather.

25. There are insufficient sanitary facilities at work, causing female workers to reduce fluid intake, which leads to health and psychological issues.

26. Verbal abuse of female workers by employers or farm supervisors was observed, especially during short breaks.

27. Stray dog threats were observed, causing fear and anxiety among the female workers, making it difficult to work in an unsafe environment.

28. It was noted that working under the extreme summer heat and the harsh winter cold is challenging, as they work long hours for a meager wage that is insufficient to meet their basic needs.

29. Female workers suffer from frequent water and electricity shortages, which exacerbates their hardships in the absence of a stable income or government support.

30. The results showed a lack of awareness about the impacts of climate change on agriculture, particularly in affected areas such as the Dead Sea, deepening the crisis of preparedness for environmental changes.

31. The results revealed a significant decline in agricultural production due to high temperatures and drought, leading to reduced crop yields and lower revenues.

32. The results showed that the agricultural sector suffers from a lack of government support, especially in providing solutions for climate change adaptation.

33. The results showed that the rising temperatures and drought have led to land degradation in areas such as the Dead Sea, negatively impacting soil quality and agricultural production.

34. The results showed significant changes in rainfall patterns, leading to a shortage of water available for crop irrigation, which contributed to lower agricultural yields.

35. The results showed that climate change contributed to an increase in pests and agricultural diseases, leading to higher use of pesticides and chemicals, as well as increased operational costs.

36. The results revealed that climate change led to a decline in agricultural revenues, which affected the income of female workers and made it difficult to earn enough to cover living expenses.

37. The results indicated that female workers face social pressures due to working in harsh climatic conditions, affecting the balance between their personal and professional lives.

38. The results showed that female workers in the agricultural sector suffer from a lack of legal protection for their rights, as they do not have adequate health guarantees or social insurance.

39. The results showed that female workers are exposed to significant health risks due to high temperatures, continuous exposure to chemicals, and the lack of appropriate occupational safety precautions, which puts them at risk of diseases and accidents.

Recommendations

In light of the results of the study, we recommend the following:

- **Enhancing Climate Change Awareness:** It is recommended to develop sustainable environmental awareness programs targeted at women in agricultural areas, with a focus on linking climate change to agricultural production and working conditions. These programs should include workshops and training courses to enhance workers' understanding of the importance of climate change and how to adapt to it.
- **Expanding Irrigation Networks and Developing Water Management Techniques:** It is recommended to invest more in expanding irrigation networks and applying modern water management techniques to mitigate the impact of climate change on agricultural water resources. Awareness programs should also be strengthened to clarify the impact of climate change on these resources and the importance of preserving them.
- **Providing Financial and Technical Support:** It is recommended to provide financial and technical support to female agricultural workers to help them adapt to climate change. Financing initiatives should be adopted to improve productive capacity, such as providing credit facilities for purchasing modern agricultural equipment or low-interest loans for farmers to compensate for losses resulting from price drops or reduced production.
- **Providing Psychological and Social Support Programs:** It is recommended to establish psychological and social support programs aimed at female agricultural workers to help them cope with the pressures resulting from climate change. These programs can contribute to enhancing the psychological and emotional capacities of workers, which will positively reflect on their work performance.
- **Enhancing Economic Sustainability for Women in Agriculture:** It is recommended to increase employment opportunities in the agricultural sector and provide financial support to improve the economic sustainability of women working in agriculture.
- Developing Training Programs to Enhance the Agricultural Sector's Resilience to Climate Change and Empower Women to Adapt to These Challenges.

- **Adopting Government Policies Supporting the Agricultural Sector:** It is recommended to develop government policies that support the agricultural sector in facing climate change, with a focus on providing specific support for women working in this sector.
- **Providing Technical and Technological Support to Farmers:** It is recommended to provide technical support to help farmers adapt to climate changes, such as using modern irrigation techniques or planting drought-resistant crops.
- Providing Effective and Sustainable Solutions to Combat Pests Affecting Crops.
- Improving Marketing Channels for Exporting Agricultural Products and Increasing Demand for Them.

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Appendices

Appendix 1: Questionnaire Tool

Survey on the Impact of Climate Change on Female Agricultural Workers in Jordan

Section One: General Information

1. Name (Optional):
2. Age:
3. Region/Village:
   - Northern Jordan Valley
   - Central Jordan Valley
   - Southern Jordan Valley
4. Educational Level:
   - Illiterate
   - Can read and write
   - Primary Education
   - Secondary Education
   - College
   - University Education
5. Marital Status:
   - Married
   - Single
   - Widowed
   - Divorced
6. Type of Agricultural Activity (Multiple Choices):
   - Crop Farming
   - Livestock Farming

- Agricultural Food Processing
- Other Activities (Please specify):

7. Do you own a farm or work on a farm?

- Farm Owner
- Work on a Farm
- Work with Family

Section Two: Female Agricultural Workers' Knowledge of Climate Change

1. How familiar are you with the concept of climate change?

- Never heard of it
- Heard of it, but my knowledge is limited
- I have a good understanding
- I have an in-depth understanding

2. Where did you get your information about climate change? (You can choose more than one option)

- Media (TV, Internet)
- Agricultural or Cooperative Associations
- Training Courses
- Through work or practical experience
- Other sources (Please specify)

3. Do you know that climate change can directly affect agriculture?

- Yes
- No
- Unsure

4. What are the most noticeable aspects of climate change that you've observed in your area? (You can choose more than one option)

- Rising temperatures
- Water scarcity or shortage

- Changes in rainfall schedules
- Increase in sandstorms or winds
- Other changes (Please specify):

5. Do you believe there is a relationship between climate change and the decrease in your agricultural productivity?
   - Yes
   - No
   - Unsure
6. Are you familiar with modern agricultural techniques that help mitigate climate change?
   - Yes
   - No

Section Three: Occupational Impacts of Climate Change

1. What changes have you noticed in the agricultural work environment due to climate change? (You can choose more than one option)
   - Changes in planting seasons
   - Increased working hours
   - Decreased crop yield
   - Increased costs (e.g., water or seed purchases)
   - Other challenges (Please specify):
2. Has climate change affected the type of crops or products you farm?
   - Yes (Please specify):
   - No
3. Do you face difficulties in obtaining sufficient water for farming?
   - Yes
   - No
   - Sometimes

4. Have you had to change the type of crops or farming methods due to climate change?
   - Yes (Please specify):
   - No
5. Has climate change affected your health as a worker?
   - Yes (Please specify):
   - No

Section Four: Social Impacts of Climate Change

1. How has climate change affected your social role within your family or community? (You can choose more than one option)
   - Increased household responsibilities
   - Challenges in balancing work and home
   - Reliance on family members for help
   - Other changes (Please specify):
2. Has climate change caused changes in your social relationships with other female workers?
   - Yes (Please specify):
   - No
3. Do you feel that you receive enough social support from the local community or agricultural associations?
   - Yes
   - No
   - Sometimes

Section Five: Economic Impacts of Climate Change

1. Has climate change affected your agricultural income?
   - Yes (Please specify how):
   - No

2. What are your strategies for dealing with lower agricultural income? (You can choose more than one option)
    - Looking for additional work
    - Reducing family expenses
    - Borrowing money
    - Selling property
    - Other strategies (Please specify):
3. Have agricultural costs increased due to climate change?
    - Yes (Please specify):
    - No
4. Have you received any financial or technical support to cope with the effects of climate change?
    - Yes (Please specify):
    - No

Section Six: Psychological Impacts of Climate Change

1. How has climate change affected your mental health? (You can choose more than one option)
    - Anxiety about the future
    - Feeling of exhaustion and fatigue
    - Frustration due to low productivity
    - Other impacts (Please specify):
2. Do you feel you receive the necessary emotional or psychological support to cope with these challenges?
    - Yes
    - No
    - Sometimes

3. Do you believe that climate change has affected your ability to make decisions related to agriculture or family?

   - Yes (Please specify):
   - No

Section Seven: Recommendations and Solutions

1. What solutions do you think could help you cope with climate change? (You can choose more than one option)

   - Training on modern agricultural techniques
   - Providing direct financial support
   - Improving access to agricultural resources
   - Improving irrigation systems
   - Other solutions (Please specify):

2. Would you like to participate in training programs or workshops to develop your agricultural skills?

   - Yes
   - No

3. What message would you like to convey to the responsible authorities to help you cope with the effects of climate change?

Appendix 2: Focus Group Discussions Tool

Climate change has significant impacts on female workers in the agricultural sector, where this sector faces multiple challenges such as water scarcity, drought, and declining agricultural productivity. These challenges directly affect the women who rely on agriculture as their main source of income.

In a discussion session organized by "Tamkeen," the impact of climate change on female agricultural workers was highlighted. Climate change increases the difficulty of agricultural work, leading to lower productivity and increased health risks, such as heat strokes and the spread of pests and insects.

Below are the outcomes of the discussion session as presented in the inputs and comments of the participants.

- Describing the challenges in the agricultural sector, specifically for female agricultural workers.
- The daily impacts (psychological effects, social protection, transportation, etc.), including temperature variations (both high and low).
- Is there awareness about climate change, and the second question is whether any workers have adapted to the climate change situation independently of government plans and civil society organizations.
- Has Jordan succeeded or is it on the path to addressing climate change?
- Recommendations from the perspective of associations in the areas you work in: What could the recommendations be?

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