مؤسسة نهر الأردن
Jordan River Foundation

RDPP
JORDAN & LEBANON
SUPPORTED BY

Investigating the Impact of Climate Change on Household Dynamics in Jordan: A Special Focus on Women, Children, and Youth

November 2025

Jordan River Foundation

Acknowledgements

Jordan River Foundation (JRF) is very thankful to the Ministry of Environment (MoEnv) for their guidance through the research lifetime, and the Research Reference Groups for their guidance and support sharing their feedback starting with the terms of reference, the devised tools, and concluding with their significant input on the proposed recommendations and key findings.

The gratification is incomplete without dedicating a special gratitude message to the research key informants for dedicating some of their valuable time to conducting the interviews and enriching the findings with their extensive expertise.

Suggested Citation

Jordan River Foundation (2025) Investigating the Impacts of Climate Change on Household Dynamics in Jordan: A Special Focus on Women, Children, and Youth

Executive Summary

Jordan is among the most climate-vulnerable countries in the world, facing growing pressures from water scarcity, rising temperatures, and population growth, (MoEnv, 2022) where environmental challenges are increasingly interlinked socioeconomic and protection concerns, that affect livelihoods, household stability, and community resilience (Al Naber et al., 2023; Abu Sada et al., 2015). In response, the Jordan River Foundation (JRF) conducted the study "Investigating the Impact of Climate Change on Household Dynamics in Jordan: A Special Focus on Women, Children, and Youth," under the Sustainable Self-Reliance for Vulnerable Syrian Refugees and Jordanian Host Communities Across Jordan project, funded by the European Regional Development and Protection Program for Jordan and Lebanon (RDPP III) is a joint European initiative supported by Austria, the Czech Republic, Denmark, the European Union, Ireland, the Netherlands and Switzerland.

The study's main goal is to generate evidence on how climate change shapes economic, social, and protection dynamics at the household level, particularly among vulnerable Jordanians and Syrian refugees. To achieve this, the study targeted 30 districts across 10 governorates, classified into most, least, and other climate-impacted areas. Furthermore, the study aligns with Jordan's National Adaptation Plan (NAP), the updated Nationally Determined Contributions (NDCs), and the Economic Modernization Vision (EMV), all emphasizing sustainable livelihoods, environmental resilience, and social protection for at-risk communities.

Methodologically, the study adopted a mixed-method, participatory approach that combined quantitative and qualitative tools, where a national household survey targeted 1,000 respondents representing different socio-economic backgrounds (yet the majority of respondents were below the poverty line), complemented by 22 Key Informant Interviews (KIIs) with experts, policymakers, and practitioners, and two Research Reference Groups (RRG) to provide support and validate the research findings. Moreover, the analysis drew on more than 77 secondary resources through an extensive literature review to contextualize and compare findings, quantitative data were analyzed using statistical cross-correlation analysis to identify patterns across exposure categories and socioeconomic indicators, while qualitative data from KIIs were thematically coded to capture emerging insights. This triangulated approach ensured an in-depth understanding of how climate change affects household dynamics, livelihoods, and protection systems.

The findings reveal that communities are already experiencing the tangible effects of climate change, where the most commonly reported hazards include heatwaves (90%), reduced rainfall (69%), and prolonged droughts (64%), all contributing to water scarcity and declining agricultural productivity. Consequently, agricultural households are among the most affected: 89% reported yield reduction, 52% increased irrigation needs, and 48% higher pest incidence. Also, tourism-based communities also face revenue losses due to extreme temperatures and environmental degradation, while the industrial sector reported declining working conditions and wage insecurity. Therefore, the cumulative effect of these climate-induced disruptions has intensified poverty, 92% of surveyed households were classified below the national poverty line, with both employed and unemployed respondents struggling to maintain stable income sources.

Furthermore, climate stress is reshaping household structures and social roles, women in affected areas are increasingly assuming economic and decision-making responsibilities, often through informal or hazardous work, while men seek income opportunities elsewhere, where this shift has heightened women's workload and exposure to protection risks. Among surveyed households, 78% reported that women had taken on more physically demanding or risky labor, and 70% indicated that women became the primary decision-makers in managing household resources. Also, families are adopting negative coping mechanisms to offset economic pressures: 12% reported child school dropout, 11% indicated that older siblings were taking care

of younger children, and 7% acknowledged leaving children unsupervised for long periods, which highlighted how economic vulnerability drives harmful responses even where climate impacts differ in intensity. Furthermore, KIIs also revealed that climate change is indirectly worsening mental health issues, domestic conflict, and gender-based violence, issues frequently linked to economic strain and social stress, which show how environmental and social vulnerabilities are interlinked.

Despite these challenges, communities are adapting through a range of household- and community-level strategies; 61% of farming households reported seeking income outside agriculture, 27% accessed loans or assistance, and 23% scaled down operations to reduce costs; however, adaptation remains largely short-term and reactive. Only a small fraction of households benefit from institutional or financial support. Importantly, KIIs and RRG discussions highlighted that enhancing linkages with other value chain stakeholders, such as transport, storage, and marketing, would reduce post-harvest losses and strengthen agricultural resilience. Local green initiatives, such as solar energy use, waste recycling, and water-saving practices, show emerging potential but face barriers related to financing, infrastructure, and technical capacity.

Based on these findings, the study recommends coordinated, cross-sectoral actions to strengthen national and community resilience. The Ministry of Social Development (MoSD) and the National Aid Fund (NAF) should reinforce social protection systems to reduce harmful coping mechanisms and integrate climate risks into vulnerability assessments. Likewise, the Ministry of Education (MoE) and the Ministry of Higher Education and Scientific Research (MoHESR) should maintain environmental education and green skills development into curricula to foster adaptive behavior for climate change impacts.

Additionally, the Ministry of Environment (MoEnv), in partnership with JRF and other stakeholders, should establish a National Innovation Hub for Climate Resilience and Livelihoods to promote community-driven adaptation, while the Ministry of Investment and MoEnv should scale green investment programs and private-sector incentives. Also, NGOs and CSOs should strengthen case management, psychosocial support, and women's economic empowerment in climate-affected areas, while the media institution should raise awareness on climate impacts and adaptation behaviors through evidence-based campaigns.

To enhance coordination and long-term impact, the study further recommends the establishment of a national coordination platform on climate and social resilience, co-led by MoSD and JRF, with participation from the NCFA, the National Aid Fund (NAF), and the MoEnv to build on JRF's climate change research as an evidence base to deepen understanding of the climate-economy-protection nexus at the household level. Furthermore, the Ministry of Health (MoH), in cooperation with the Civil Defense Department and the Ministry of Labor (MoL) should implement community-based health awareness and safety programs, especially for the outdoor workers who are exposed to extreme weather conditions. Also, the Ministry of Higher Education and JRF, together with national universities, should also establish a Climate, Household Research Consortium to generate longitudinal evidence on the social and economic dimensions of climate change, informing policy design and national adaptation planning.

Moreover, donors and development partners are encouraged to provide predictable, multi-year funding for social protection and adaptation initiatives, invest in climate-resilient infrastructure and livelihoods, and support inclusive green market systems. If implemented effectively, these recommendations will enhance evidence-based policymaking, stabilize household incomes, and build adaptive capacity among vulnerable communities.

In conclusion, this study highlights that climate change in Jordan is an environmental, social, and economic issue that affects every aspect of household well-being. Therefore, strengthening resilience

requires integrating environmental sustainability with social protection, gender equity, and economic inclusion.

Table of Contents

Glossary

Term	Definition
Climate Change	A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNFCCC, 1992)
Climate Adaptation	Climate adaptation means taking action to prepare for and adjust to the current and projected impacts of climate change. With climate change bringing more frequent and intense extreme weather events such as heatwaves, droughts and floods, individuals and communities can reduce their vulnerability and increase their resilience by adapting now. In human systems, adaptation is the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, adaptation is the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects (Global Center on Adaptation, n.d).
Environmental and Social Safeguards	Environmental and social safeguards are policies and procedures designed to avoid, minimize, and mitigate potential harm to both the environment and people resulting from projects. They ensure human rights are respected, communities can participate, and negative impacts like pollution, land disputes, and harm to biodiversity are managed throughout a project's lifecycle (General definition; adapted from GCF requirements).
Livelihood	A livelihood comprises the capabilities, assets (including both material and social resources), and activities required for a means of living (jobs, businesses, or any income-generating activity). A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Chambers & Conway, 1991).
Green Entrepreneurship	The creation and development of economic projects that combine profit and environmental protection, by using natural resources efficiently and responsibly, and relying on innovation and environmentally friendly technologies to promote sustainability and reduce environmental impact (adapted from GGGI and ILO).
Green Jobs	Green jobs are decent jobs that contribute to preserve or restore the environment, be they in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency (ILO, n.d[1])
Green Sectors/Industries	Economies striving for a more sustainable pathway of growth, by undertaking green public investments and implementing public policy initiatives that encourage environmentally responsible private investments (UNIDO, n.d).
Self-Employment Jobs	Workers who worked on their own account or with one or more partners and have not engaged on a continuous basis any employees to work for them (ILO, n.d[2]).
Gender-based Violence	Any act that results in, or is likely to result in, physical, sexual, or psychological harm or suffering to women, whether occurring in public or private life, and constitutes a violation of human rights driven by inequalities between men and women in society. Situations such as armed conflict, natural disasters, and disease outbreaks exacerbate the risk of GBV, particularly violence against women and girls (UNFPA, n.d; WHO, n.d).

Early Marriage	Marriage that occurs at an age below the official minimum age for marriage which is 18 years old. However, the law includes an exception that allows a judge to approve the marriage of a person who has completed their 16th year (i.e., has turned 16) if the judge deems the marriage to be in their best interest and of necessity (adopted from Jordanian Personal Status Law No. 15 of 2019).
Coping Mechanisms	The thoughts and behaviors mobilized to manage internal and external stressful situations (Folkman and Moskowitz, 2004). It is a term used distinctively for conscious and voluntary mobilization of acts, different from 'defense mechanisms' that are subconscious or unconscious adaptive responses, both of which aim to reduce or tolerate stress (Venner M., 1988).
Poverty Pockets	Refers to the sub-districts where the percentage of individuals below the absolute poverty line exceeds 25% of the total population of the sub-district. They total 32 pockets, where they are not restricted to a specific region or governorate (DoS, 2010).
Poverty Line	It is the dividing line between income and consumption of the poor and the non-poor. The individual is considered to be poor if his consumption is below the minimum level of the basic needs of the individual and the minimum value of the basic needs of the individual is defined as the poverty line (DoS, n.d). In 2023, the World Bank report indicated that the national poverty line per capita in Jordan is USD 7.9 per day, equivalent to 5.6 Jordanian Dinars, or about 168 JOD per month (World Bank, 2023).

List of Abbreviations

Abbreviation	Full-Term
AVTR	Amman Vision Treatment and Recycling
AWC	Arab Water Council
AWO	Arab Women Organization
CEESI	Center of Energy and Environmental Sustainability in the Industry
DoS	Department of Statistics
Eco	Ecological
EMV	Economic Modernization Vision
FAO	Food and Agriculture Organization
GBV	Gender-based Violence
GDP	Gross Domestic Product
GGGI	Global Green Growth Institute
GJU	German Jordanian University
HBBs	Home-based businesses
HVAC	Heating, Ventilation, and Air Conditioning
IFH	Institute for Family Health
ILO	International Labor Organization
IUCN	International Union for Conservation Nature
IWMI	International Water Management Institute
JCI	Jordan Chamber of Industry
JRF	Jordan River Foundation
KIIs	Key Informant Interviews
M^3	Cubic Meters
MEL	Monitoring, Evaluation and Learning
mm	Millimeter
MoE	Ministry of Education
MoEnv	Ministry of Environment
MoHESR	Ministry of Higher Education and Scientific Research
MoL	Ministry of Labor
MoLA	Ministry of Local Administration
MoPIC	Ministry of Planning and International Cooperation
MoSD	Ministry of Social Development
MoTA	Ministry of Tourism and Antiquities
MWI	Ministry of Water and Irrigation
NAF	National Aid Fund
NAP	National Adaptation Plan
NARC	National Agricultural Research Center
NCFA	National Council for Family Affairs
NDC	Nationally Determined Contributions
ND-GAIN	Notre Dame Global Adaptation Index
NGOs	Non-Governmental Organization
OHCHR	Office of the United Nations High Commissioner for Human Rights
RDPP III	Regional Development and Protection Programme
RRGs	Research Reference Groups
TTI	Trip to Innovation
UN	United Nations
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations International Children's Emergency Fund
UNIDO	United Nations Industrial Development Organization
WFP	World Food Programme
WHO	World Health Organization

List of Figures

List of Tables

1. Introduction

Jordan is among the most climate-vulnerable countries in the world, with scarce water resources, an arid climate, and rapid population growth, which have led Jordan to face increasing pressures that are increasingly interlinked with climate change (MoEnv, 2022). Rising temperatures, erratic precipitation, prolonged droughts, flash floods, and the intensification of extreme weather events are no longer future projections; they are current realities affecting communities across Jordan (FAO, 2020; Haddad, 2023; Climate Watch, 2021). Therefore, these environmental shifts are not isolated phenomena; they reflect on livelihoods, household dynamics, and community resilience.

Climate change in Jordan is increasingly understood as a social and economic issue. Its effects are deeply interlinked with livelihoods, protection systems, and household well-being. Recurrent droughts and rising temperatures have disrupted agricultural productivity, depleted water sources, and increased the cost of living, pushing many families into deeper economic precarity (Haddad, 2023; Salameh and Abdallat, 2020; WFP, 2023). These pressures often translate into social and protection challenges, including heightened household tensions, increased child labor, early marriage, and reduced access to essential services. Moreover, women, youth, refugees, and informal workers are disproportionately impacted, as they are more likely to work in climate-sensitive sectors and lack access to safety nets or adaptive resources.

Jordan River Foundation (JRF), with its long-standing commitment to social protection, sustainable livelihoods, and community development, recognized the urgency of exploring these linkages through an evidence-based approach. This study titled ***"Investigating the Impact of Climate Change on Household Dynamics in Jordan: A Special Focus on Women, Children, and Youth,"*** was conducted by JRF under the Sustainable Self-Reliance for Vulnerable Syrian Refugees and Jordanian Host Communities Across Jordan project, funded by the European Regional Development and Protection Program for Jordan and Lebanon (RDPP III) is a joint European initiative supported by Austria, the Czech Republic, Denmark, the European Union, Ireland, the Netherlands and Switzerland. The study responds to an evidence gap by exploring how climate change interacts with household dynamics, livelihood security, and protection concerns, with a particular focus on vulnerable groups.

Building on this, the study was developed to address knowledge gaps identified through the literature review conducted by JRF, which examined over 77 secondary resources. Despite the growing research resources on climate change in Jordan, prior studies provided limited evidence on how climate change stressors affect income security and livelihood stability. Data on climate-induced migration and community-level adaptation measures also remain scarce, which hindered evidence-based policymaking. Moreover, most existing studies lacked a gender lens, overlooking how climate risks disproportionately affect women's economic and social roles and children protection concerns.

Responding to these gaps, this study was designed to understand how climate change is reshaping economic and social realities in Jordan. Specifically, it examines the impact of climate change on the economic status and stability of households and individuals in areas where communities are already experiencing disrupted livelihoods and rising living costs. It also explores how households and communities are coping and adapting to these pressures, identifying the strategies they employ to sustain income, protect family well-being, and preserve social cohesion under stress. Furthermore, the study investigates what strategies and programs can strengthen community resilience to the growing impacts of climate change, focusing on the enabling factors that help some communities adapt more effectively than others and how these lessons can inform broader national responses. The research is also aligned with the broader framework of JRF's Strategy Map (2022–2025) and the RDPP III objectives, both of which emphasize sustainable livelihoods, environmental sustainability, and social protection. In addition, it complements Jordan's national climate priorities outlined in the National Adaptation Plan (NAP), the updated Nationally Determined Contributions (NDC2 and the ongoing NDC3 process), and the Economic Modernization Vision (EMV), which supports collective efforts to build a more adaptive, inclusive, and climate-resilient national economy.

Furthermore, the study aims to produce actionable, evidence-based recommendations for strengthening climate resilience in Jordan, which were designed to inform and guide the Government of Jordan, donor agencies and financing bodies, implementing NGOs and CSOs, the private sector, academic institutions, and media and communication entities in designing, targeting, and coordinating policies and programs that integrate livelihoods, social protection, and environmental sustainability. The importance of this study lies

in its ability to bridge evidence gap by providing an understanding of how climate change affects household livelihoods, protection, and social stability across different areas of Jordan. It translates lived community experiences into data that can directly inform national policies, to ensure that climate action and resilience planning are grounded in local realities.

Therefore, the study positions climate change as a cross-cutting issue that connects environmental sustainability with economic stability and social protection. It emphasizes that building resilience in Jordan requires addressing livelihoods, protection, and governance together, rather than in isolation. Most importantly, it amplifies the voices of households navigating the daily realities of climate change, ensuring that resilience strategies are rooted in the needs and capacities of those most affected.

2. Methodology

This research adopted a participatory and multi-stakeholder approach, engaging policymakers, practitioners, and experts throughout the research cycle. JRF conducted a desk review, followed by the formation of two Research Reference Groups (RRGs) to guide and validate the study design and findings. Subsequently, KIIs were carried out with key stakeholders, complemented by a national household-level survey. The findings presented in this study were from all these sources.

2.1. RRGs

Two RRGs were established: an external RRG and an internal RRG, to provide guidance, technical expertise, feedback, and validation throughout the research stages. The external RRG comprised 9 entities. Members represented government bodies, international organizations, and academic institutions. The internal RRG was composed of 8 members of JRF's Climate Change Committee, and technical experts in climate change, livelihood, and protection.

2.2. KIIs

Between March 25 and May 22, 2025, a total of 22 KIIs were conducted to capture experts' insights and institutional perspectives on climate change, resilience, and vulnerability in Jordan. The KII followed a semi-structured format, guided by a questionnaire covering 7 thematic areas: (i) policy and strategic vision, (ii) emerging priorities and risks, (iii) livelihood and economic impacts, (iv) protection and vulnerability, (v) migration and displacement, (vi) health impacts, (vii) green entrepreneurship and future resilience priorities.

Table 1: Interviewed Entities

Type of Entity	Number
International Non-Governmental Organizations	8
International Missions (e.g. Embassy of Netherlands and FCDO)	2
National Governmental Entities	8
Civil Society and Specialized Institutions	4

KIIs were transcribed and analyzed using a thematic analysis approach, where all interview transcripts were reviewed to identify common patterns, ideas, and insights. Responses were coded according to predefined domains from the KIIs guide, while inductive coding captured emerging themes.

2.3. Mixed-Method Survey

The mixed-method survey was conducted on a national level, between March and July 2025, with a sample of 1,000 respondents drawn from 30 districts/sub-districts, classified into 3 categories of climate exposure (most impacted, least impacted, and other impacted areas). The classification was informed by two main sources: (1) the Forth National Communication on Climate Change,[1] which identified the most and least impacted areas, and; (2) JRF's desk review, which added other districts based on historical climate-related events (e.g., flash floods) and significance of areas in agriculture and tourism.

The categorization ensured coverage of districts with different climate risk profiles, where most impacted areas represent recurrent locations and severe exposure to climate-related risks, least impacted areas reflect relatively lower exposure; and the other impacted areas were included due to their economic and environmental importance, especially in tourism and agriculture. Two areas were excluded due to non-response during the survey: Salhiya sub-district (classified as most impacted) and Jrainah sub-district

[1] The Fourth National Communication on Climate Change is Jordan's official report to the UNFCCC that assesses greenhouse gas emissions, sectoral vulnerabilities, and national adaptation priorities across key sectors, in addition it identifies the most and least climate-impacted districts and sub-districts in Jordan, based on exposure to droughts, water scarcity, and extreme weather events, providing a scientific foundation for climate risk classification and policy planning

(classified as least impacted). Their absence did not affect representativeness, as the remaining districts within each category were covered.

Table 2: List of the Most, Least, and Other Impacted Areas

Most Impacted Areas	Least Impacted Areas	Other Impacted Areas
Irbid Qasabah District (Irbid)	Alan & Zayy Sub-District (Balqa)	Koorah District (Irbid)
Ramtha District (Irbid)	Mahes & Fuhais District (Balqa)	Aghwar Shamaliyah District (Irbid)
Karak Qasabah District (Karak)	Ayy Qasabah District (Karak)	Al-Ardha Sub-District (Balqa)
Badia Shamaliyah Gharbiyah Sub-District (Mafraq)	Aqaba District (Aqaba)	Al-Shooneh Al-Janoobeh (Balqa)
Rwaished District (Mafraq)	Wadi Araba Sub-District (Aqaba)	Bsaira District (Tafileh)
Jizah Sub-District (Amman)	Um Elqotain Sub-District (Mafraq)	Quairah Dstrict Center (Aqaba)
Quaismeh District (Amman)	Na'oor Sub-District (Amman)	Azraq Sub-District (Zarqa)
Muqqar Sub-District (Amman)	Hosba'n Sub-District (Amman)	Petra District (Ma'an)
Sahab District (Amman)	Um Elbasatien Sub-District (Amman)	Shobak District (Ma'an)
		Amman Qasabah District (Amman)

Survey data were analyzed using both quantitative and qualitative techniques. First, quantitative data were processed and analyzed using Excel through cross-tabulations and correlation analysis. Second, qualitative data from open-ended questions were analyzed using descriptive and coding approaches to capture emerging narratives and contextual insights that complement the quantitative findings.

2.3.1. Sampling and Respondents

The survey employed a stratified sample to ensure representativeness across exposure categories and key demographic groups (climate-exposed areas, nationality, and gender). Targeted numbers for each district were determined proportionally based on population data from the Department of Statistics (DoS), Q1 2025. The sample achieved a 95% confidence level and a 3% margin of error of the total population in the targeted districts.

Building on this design, the survey sought to capture the perspectives of a wide range of population groups. Respondents therefore included: (1) male and female participants; (2) adults aged 18 years and above (covering youth, early-middle age, late-middle age, and elderly groups); (3) employed and unemployed individuals across agriculture, industry, tourism among other economic sectors, and; (4) Jordanian nationals, Syrian refugees, and other nationalities residing in the targeted areas. The final sample was distributed across the 3 categories of exposure: 377 respondents in most impacted areas (38%), 236 in least impacted areas (24%), and 387 in other impacted areas (39%).

2.4. Desk Review

The desk review applied a qualitative analytical approach, drawing on 77 academic articles, research papers, sectoral reports, statistical data, and national policies and strategies. Sources included ministries such as MoEnv, MoPIC, MWI, and MoLA, as well as international organizations including UNDP, FAO, ILO, UNICEF, WFP, UN ESCWA, UNFPA, World Bank, OHCHR, and UN Women. Population and socio-economic data from the Department of Statistics (DoS) were also used.

Secondary data was organized into thematic areas: climate change trends; sectoral impacts; socio-economic vulnerabilities of women, children, and youth; coping and adaptation strategies; national climate policies; and green entrepreneurship opportunities. Desk review findings were embedded throughout the study to support the primary findings where needed.

2.5. Limitations

The study faced a number of limitations. First, two areas in the survey, Salhiya (most impacted) and Jrainah (least impacted), recorded no respondents despite repeated attempts. Although their absence did not affect the overall representativeness of the. Second, concepts such as climate change, green entrepreneurship and jobs, and resilience were not always familiar to respondents. Therefore, enumerators, who received training on the survey tool, definition, and ethical data collection, provided simple and standardized explanations to ensure respondents clearly understood key concepts such as climate change, livelihoods, green entrepreneurship and jobs, and protection concerns. All explanations were based on the definitions included in the enumerator guide and aligned with the glossary list in the study, to ensure accuracy and consistency across interviews.

Moreover, protection concerns such as GBV, child labor, and marriage of individuals under the age of 18 (early marriage) are sensitive issues that may have been underreported due to stigma, fear, or cultural barriers, for instance, during the survey many respondents hesitated or provided answers when asked about these topics, often referring to others in the community rather than their own households.. To mitigate this, enumerators were trained in ethical interviewing and confidentiality, but the possibility of underrepresentation remains.

To minimize the impact of these limitations, JRF applied several strategies, such as: (1) ensuring proportional coverage across the three categories of climate exposure, even when some sub-districts lacked respondents; (2) providing clear explanations of technical terms during surveys and validated findings through triangulation across KIIs, RRG feedback, and desk review; and (3) prioritizing confidentiality and enumerator training to improve the reliability of responses on sensitive issues.

3. The People Behind the Numbers

3.1. Demographic Characteristics of Survey Respondents

The demographic profile of the 1,000 respondents provided contextual background for interpreting the results and patterns across gender, nationality, age, and other key characteristics.

One of the first aspects to consider is gender, which reveals a nearly even balance between men and women. For instance, women made up 51%, while men accounted for 49%. Another key factor is nationality, which was proportionally aligned with the population statistics of Q1 of 2025. Most of the respondents were Jordanian nationals and accounted for 92% of the total sample. Syrian refugee respondents made up 7%, while 1% identified as belonging to other nationalities, including Iraqi, Egyptian, Palestinian, Yemeni, Pakistani, and Somali nationals.

Given the study's focus on youth, the sample concentrated on younger and working-age adults, as their experiences are most relevant for analyzing livelihoods, employment, and household adaptation to climate pressures. The majority of respondents fell within the early middle adult group, aged 31 – 45 (37%), followed by youth aged 18 - 30 (32%), while middle-aged adults, aged 46 – 59 (24%), and a smaller proportion of elderly respondents (8%) participated.

Moving to the marital status of respondents, where the majority of them were married (58%), around 31% identified as single, while smaller shares reported being widowed (5%), divorced (3%), or separated (2%).

Figure 2: Marital Status Distribution among Females

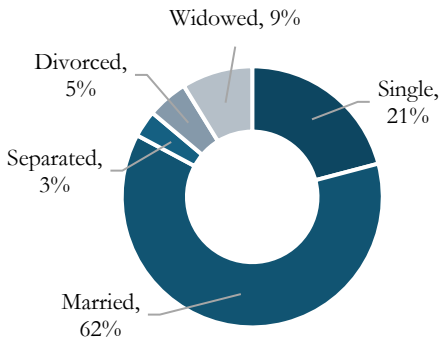


Figure 1: Marital Status Distribution among Males

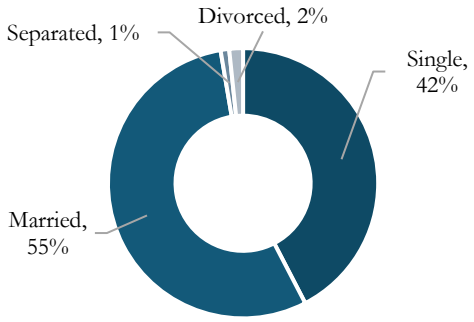
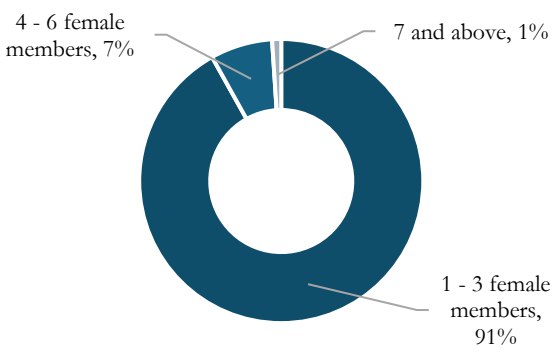


Figure 3: Female Members Distribution



Additionally, the survey examined whether respondents identified themselves as the head of household, recognizing this role as central to decision-making, livelihood strategies, and household vulnerability to climate change. Overall, 46% of respondents (27% of females and 66% of males) reported being the head of their household, while 54% (73% of females and 34% of males) indicated that this role was held by someone else.

It was observed that among households where the respondent was not the head, the role was overwhelmingly male-dominated: of the respondents in this area, 94% identified the household head as male, while only 6% reported a female household head.

The survey findings show that the average household size among respondents was 5.7 members, with sizes ranging from single-person households to very large ones of up to 23 members. The majority of households fell within the 5 – 7-member range, making it the most common household size.

For all households surveyed, 67% have at least 1 youth member, while 33% do not. The same question was asked for the presence of female members who were 18 years old or above; 86% of households reported having at least 1 female member, while 14% did not.

3.2. Socio-Economic Background of Respondents

The largest share of respondents reported holding a bachelor's degree (27%), followed by those who had completed Tawjihi with 20%, and Elementary Education (19%). Other notable groups included 16% with secondary education, 12% with intermediate diploma, while a smaller proportion reported higher qualifications, including master's degrees (4%), higher diploma (1%), and PhD (<1%). Meanwhile, 2% of respondents were illiterate.

3.2.1. Employed Respondents

Employment status varied among the respondents. Overall, 42% of respondents reported being employed, while the majority of respondents, 58% were unemployed at the time of the survey.

Among those employed, the largest share (44%) worked in full-time jobs, followed by 22% in self-employment, 14% as day laborers, 9% in home-based businesses (HBBs), 6% in part-time work, 3% in temporary positions, 1% as freelancers, and fewer than 1% as interns.

Employment type was closely linked to educational level. Respondents with bachelor's degrees were most likely to hold full-time jobs, while those with elementary or secondary education were more often engaged in day labor or self-employment. Illiterate respondents and those with only a basic education were concentrated in low-skill or informal work.

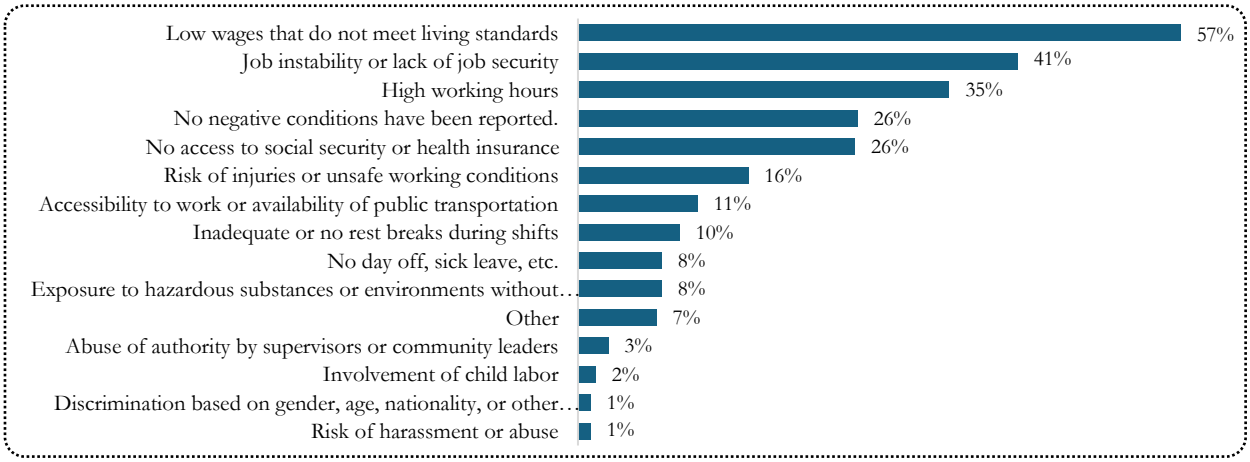
Nationality also shaped employment patterns; for instance, among Jordanian respondents, 42% reported being employed, compared to 36% of Syrians and 20% of other nationalities. Syrians were more likely to be engaged in day labor or self-employment, reflecting limited access to stable and formal jobs.

Gender disparities were noticed. Of all the employed respondents, 70% were men compared to 30% women. Men were more likely to hold full-time jobs (77% of men vs. 23% of women) and engage in self-employment (80% of men vs. 20% of women). Women, on the other hand, were more concentrated in HBBs (90% of women vs. 10% of men). Among the 44% employed respondents, employment was concentrated in a limited number of sectors, with 22% industry, 14% government, and 11% agriculture absorbing the largest shares.

3.2.1.1. Working Conditions

Among the employed respondents, the majority described facing difficult working conditions. The most frequently cited issue was low wages that do not meet living standards, reported by 57% respondents. This was followed by job instability or lack of job security, and high working hours among other conditions, as follows:

Figure 4: Working Conditions



Other challenges reported by respondents can be grouped into several recurring themes, most commonly limited marketing and sales opportunities, compounded by low public acceptance of certain jobs and seasonal demand. Other concerns included high rental and permit costs, restrictive regulations, and difficulty accessing essential supplies, alongside low financial returns, debt from crop failures, and exploitative contracts. Finally, respondents noted weak infrastructure, limited support, and gender-specific barriers, particularly for women balancing childcare or facing restrictions on mobility.

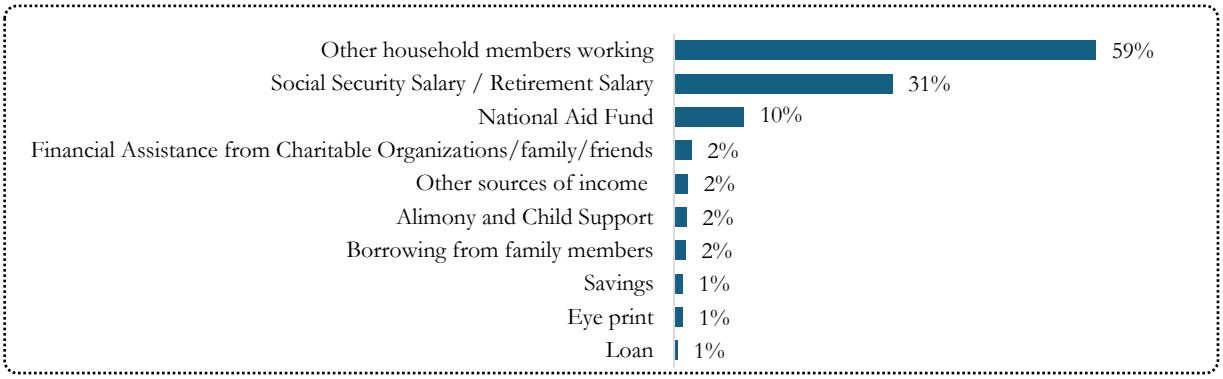
Among all sectors, respondents working in the industry reported the highest concentration of negative working conditions. Workers highlighted low wages[2] (67%), job instability (46%), and long working hours (41%) as the most pressing issues. Many also reported a lack of social security or health insurance (34%) and unsafe working environments (27%).

Additionally, the agriculture sector also displayed considerable vulnerabilities. Here, 70% mentioned low wages, 63% pointed to job instability, and 41% respondents reported high working hours. Moreover, 43% noted the absence of social security or health insurance, while 24% highlighted unsafe conditions, and 17% mentioned exposure to hazardous environments.

3.2.2. Sources of Income for Unemployed Respondents

Among respondents who reported that they were unemployed, the majority relied on alternative sources of household income. The most common source was other household members working, reported by 59% respondents.

Figure 5: Sources of Income



3.2.3. Poverty Status of Respondents

The survey results reveal that most respondents live below the poverty line. Out of 1,000 households, 918 respondents (92%) were classified as living below the poverty line, while only 82 respondents (8%) were above it. The reported average household income was 398 JOD (the average income per person was 69.8 JOD).

When cross-analyzed with employment status, poverty was found to be prevalent among both working and non-working respondents. Among those not working, 560 respondents and their households were below the poverty line (96% of the unemployed respondents), while only 23 respondents managed to remain above it. Even among the employed respondents, 358 respondents fell below the poverty line (85% of the employed respondents), compared to just 59 respondents above it. The high poverty reflects structural economic challenges, including the dominance of low-paying and informal jobs, limited access to stable employment, and heavy reliance on sectors highly exposed to climate impacts.

3.2.4. Housing and Living Conditions

The majority of respondents reported living in houses (48%) or apartments (46%), while smaller numbers lived in shared housing (5%), mobile housing (1%), or studios (<1%). In terms of housing stability, most respondents had been in their current residence for extended periods (70%) had lived in the same place for

[2] Often referring to earnings that are insufficient to cover household expenses.

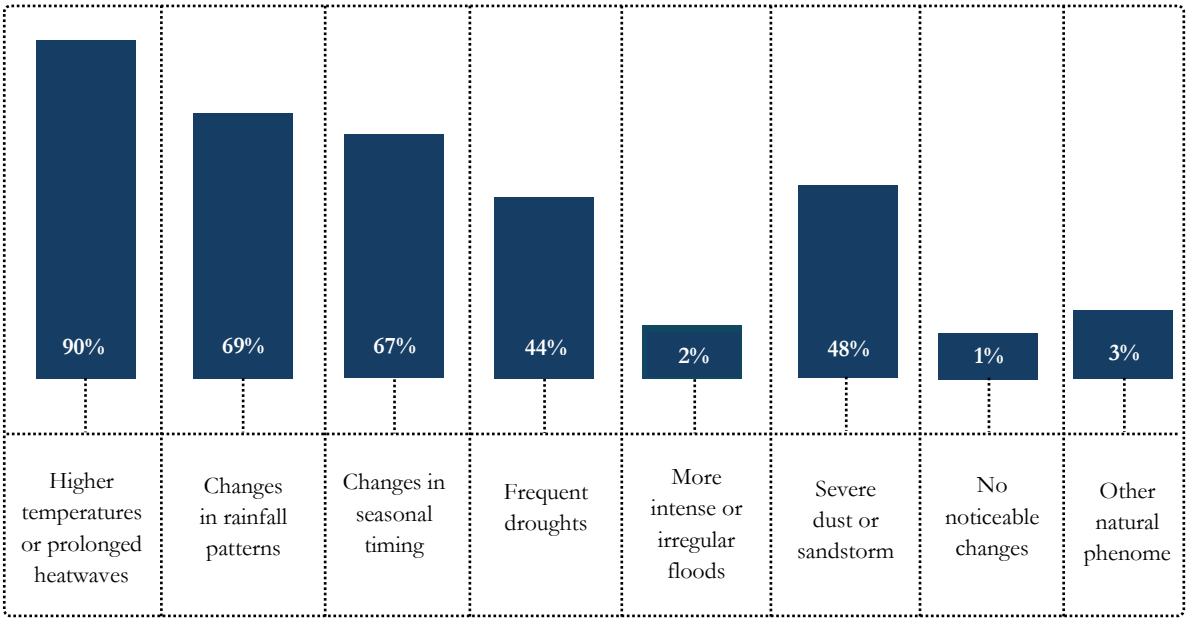
more than seven years, while 16% reported between four and six years, and 12% between one and three years. Only 2% moved within the past year.

Reasons for recent moves varied. Some respondents cited marriage or establishing a new household, while others pointed to financial pressures such as rising rent or accumulated debt. A smaller number reported structural issues with previous homes, including unsafe or collapsed buildings, while a few mentioned work-related relocation or charitable housing support. One respondent explicitly linked relocation to climate conditions, moving from the Jordan Valley due to increasing heat. The majority of households were owners (62%), while 38% rented their homes. Ownership was similar among employed and unemployed respondents, whereas rent was evenly distributed across both groups.

4. From Heatwaves to Flash Floods: Climate Change Patterns

Jordan witnessed a series of natural phenomena and shifts that are linked to climate change, posing challenges to its environmental and socio-economic systems. The KIIs findings point to three overarching and interconnected themes: significant alterations in precipitation patterns, a rise in temperature extremes, and an increased frequency and intensity of associated natural disasters. Besides KIIs, survey findings highlighted observed phenomena by the respondents themselves.

Figure 6: Observed Natural Phenomena



One of the main hazards associated with climate change is high temperatures, reported by 90% of respondents, which have an impact on generating other hazards and impact many sectors, especially agriculture, where high temperatures directly affect the growth and production of tuber and root crops (WFP, 2019). For many vegetable crops, high temperatures can reduce quality parameters including size, soluble solids, and tenderness (WFP, 2019). Also, as the experts mentioned that the rise in temperatures and the increased occurrence of severe heatwaves which pose direct risks to human health and economic activities. It was specifically mentioned that these extreme heat events disproportionately affect vulnerable groups, such as informal workers and agricultural workers/farmers, who have limited means to mitigate their exposure.

Other main threats posed are water scarcity and droughts, where Jordan is witnessing one of the worst periods of droughts in its history, as 44% indicated. The impacts reach the agricultural livelihoods through decreased productivity in addition to having an impact on urban living and household water availability (WFP, 2023). According to Jordan's Fourth National Communication on Climate Change, Jordan's per capita renewable freshwater resource stands at 61 m^3/year, which is below the severe water scarcity threshold of 500 m^3/year (MoEnv, 2022[A]). Additionally, water scarcity means less water for rainfed and irrigated agriculture, considering the significant risks brought about by reduced rainfall, droughts, and floods (El-Sharif and Muasher, 2024).

In addition, the standardized precipitation indexes show that Jordan will experience more drought, especially in winter and spring (FAO, 2020), which the indicators show that precipitation falls around 75% during winter, as it ranges between 50 – 500 mm annually, depending on the location; however, the rainfall has decreased (MoEnv, 2022[A]), as 69% respondents reported changes in rainfall patterns. The KIIs findings explained this phenomenon in two ways. Firstly, there is an overall reduction in annual precipitation, which leads to more frequent and prolonged periods of drought, which exacerbates Jordan's existing water scarcity challenges. Secondly, the timing and distribution of rainfall have become highly erratic and unpredictable which disrupts traditional seasonal cycles and agricultural planning. Therefore, drought has an impact on the water and agricultural sectors (Haddad, 2023) in addition to affecting lives in cities and rural areas,

infrastructure, farms, food production processes, industries, and other economic sectors (Jaskolski et al., 2022). Besides, drought conditions affect several areas, such as the Jordan Valley, which serves as an agricultural hub and will be unable to sustain production unless real, fundamental, and sustainable solutions are implemented (Haddad, 2023).

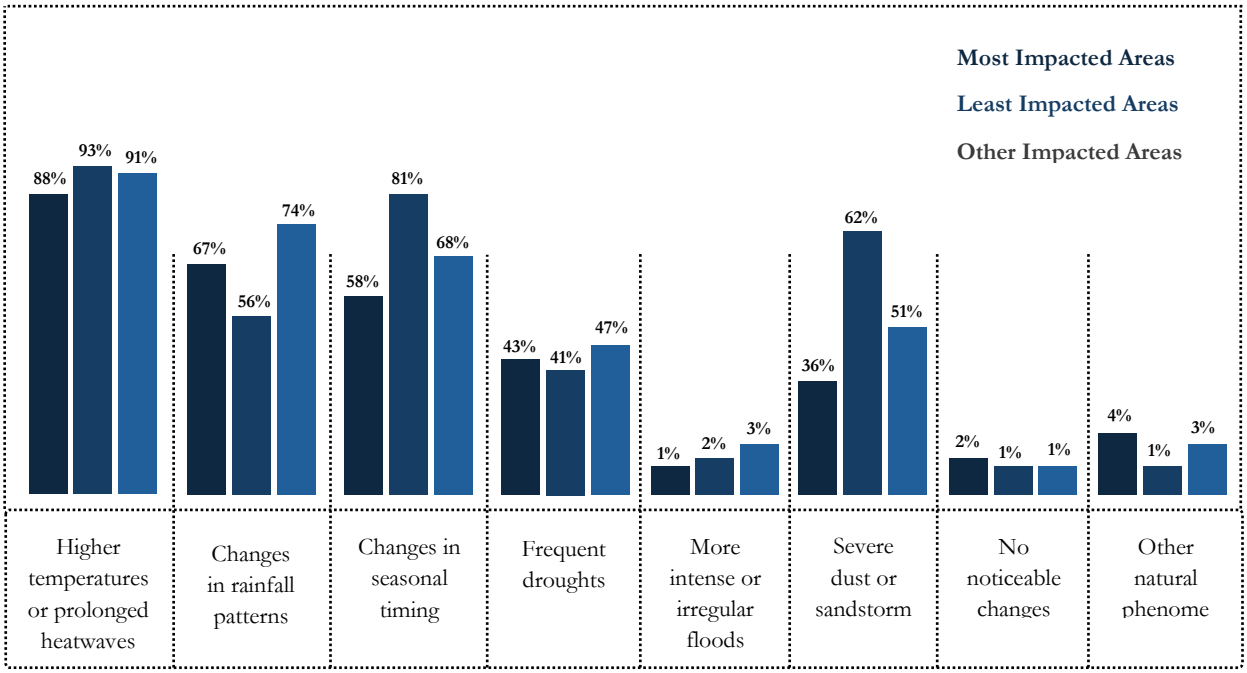
Furthermore, Jordan witnessed another natural phenomenon associated with climate change, flash floods, which account for 37.5% of the annual hazard occurrences (Climate Watch, 2021) and were reported by 2% of respondents. experts stated that the decrease in overall rainfall is accompanied by an increase in the intensity of precipitation events when they do occur. The experts from KIIs mentioned that the growing problem of heavy rainfall leading to destructive flash floods, which are now considered one of the most serious climate-related risks, described as a danger tragically exemplified by a deadly flash flood incident in the Dead Sea. It often results in severe economic damage, especially in urban areas where infrastructure is vulnerable. Historically, Jordan has experienced flash floods, including the Ma'an flood of 1966, which resulted in 266 deaths, and in 2018, flash floods in Wadi Zarqa Ma'in and Petra, caused by intense rainfall, led to 21 lives in the Dead Sea region and infrastructural damage (UNDP, 2023). After weeks, another flash flood hit Petra, forcing thousands of tourists to evacuate and leaving behind 12 dead people (UNDP, 2023). Other governorates faced flash flood, such as Irbid, where residents complained that this flash flooding flowed into school buildings, damaged infrastructure, overflowed sewage networks, and in some particularly low-lying areas, claimed homes. (Perera, 2023).

Furthermore, a common thread mentioned throughout the KIIs was the theme of increasingly erratic and extreme weather, with noticeable shifts in the traditional four seasons, which was agreed by 67% of the survey respondents, and identified a wider range of hazardous conditions posing risks.

Furthermore, the survey respondents reported other hazards associated with climate change, such as severe dust or sandstorms (48%), and 3% of them reported other natural phenomena, such as: colder winters, low snowfall, torrential rain (Ghaddaq), Khamsin winds, spread of pests and reptiles, declining vegetation cover, and humidity fluctuations.

Due to the study's focus on the three impacted areas, it was found that the most, least, and other impacted areas share the same observed natural phenomena associated with climate change, which means that all districts across Jordan are impacted by climate change.

Figure 7: Observed Natural Phenomena Associated with Climate Change



Overall, the survey findings indicated that rising temperatures, irregular rainfall, and shifts in seasonal timing are the most commonly observed climate hazards across all impacted areas. These patterns pointed to a growing trend of heat stress, drought recurrence, and water scarcity, which together represent the most severe and widespread impacts of climate change in Jordan.

4.1. Where Does Climate Change Hit Hardest?

Although there are similarities in observed natural phenomena between the three categorized groups, the KIIs revealed that climate change impacts differ across area types, with the most severe impacts occurring in areas characterized by high climatic sensitivity, pre-existing socio-economic vulnerabilities, and inadequate infrastructure.

KIIs revealed that several key hotspots were identified, for instance, the Jordan Valley is considered a primary area of concern due to its exposure to temperature increases, which creates challenges for agriculture and public health. Also, the Dead Sea basin is highlighted as a high-risk area for flash floods, a danger highlighted by past deaths.

While other interviewed experts mentioned that the northern governorates, particularly Mafraq, and the southern governorates, which are often referred to as "poverty pockets," including Karak, Tafilah, and Ma'an, are affected by water scarcity and drought, impacting agricultural livelihoods. Others reported that urban areas are also affected, with climate-related damage to housing observed in Zarqa and Ruseifa due to climate change. The impacts were also observed by the experts in Za'atari and Azraq refugee camps, where refugees suffer from water scarcity and harsh living conditions.

On the other hand, the survey revealed similarities and differences, as where it was observed that agricultural fields are the most affected areas by natural phenomena, with 67% of respondents identifying them, which may be due to the vulnerability of farming livelihoods and food production to changing weather patterns, droughts, and rainfall variability. Others mentioned residential areas with 48%, which is similar to the KIIs' findings, and this highlights that the impacts are not exclusive to rural or agricultural areas. Open desert was mentioned by 30% of respondents.

While less frequently mentioned, tourist areas (20%) and industrial areas (18%) are also reported as affected. A small portion of respondents (8%) stated that no particular area is more affected, while 1% mentioned other locations, such a low-lying and high-altitude areas, valleys, the Jordan Valley, citrus farming zones, rural areas, and eastern regions.

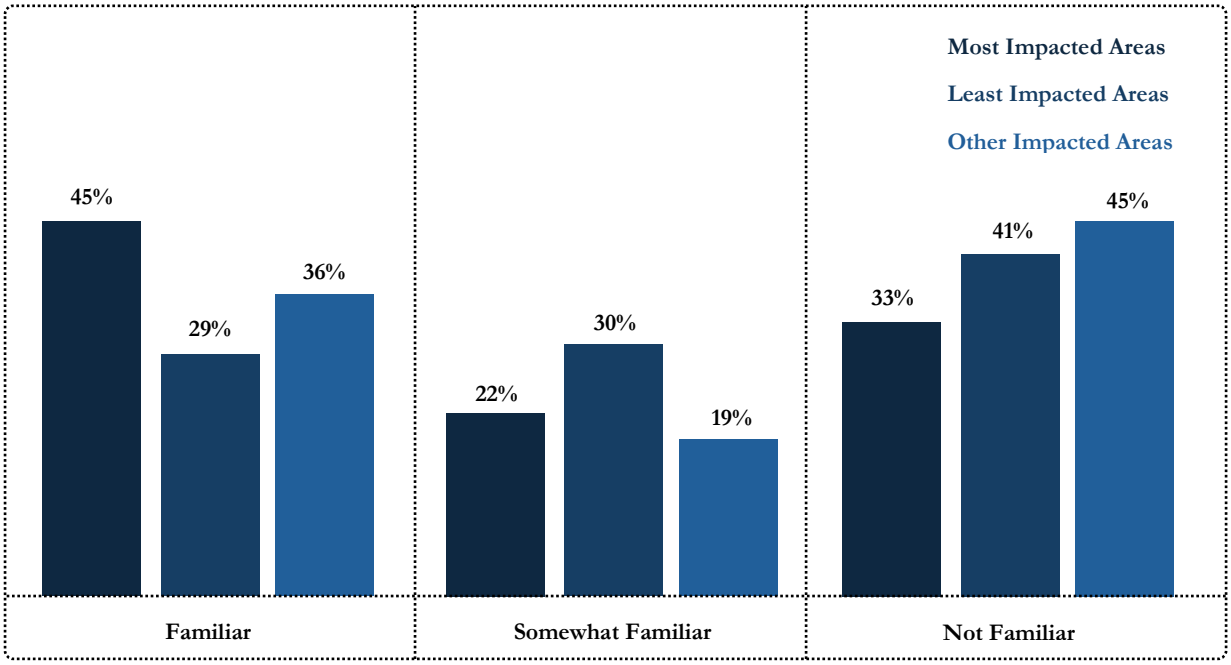
Across all three areas of districts, agricultural fields consistently emerge as the areas most affected by natural phenomena, which was particularly strong in the most impacted areas (69%) and the other impacted districts (79%), showing the vulnerability of farming livelihoods to changes in temperature, rainfall, and drought. In contrast, the share is lower in the least impacted areas (44%).

Residential areas are the second most commonly affected, with proportions ranging from 44% in the other impacted areas to 59% in the least impacted areas, showing that households and urban environments are broadly exposed regardless of the level of impact. While open desert was also frequently mentioned, particularly in the most and least impacted areas (32% and 36%), but less in the other impacted districts (23%). Also, tourist and industrial areas are less often identified as the most affected, though they appear more prominently in the least impacted districts (30% and 28%).

4.2. Awareness and Perceptions of Climate Change

The survey findings indicate that knowledge of the term "climate change" is uneven among respondents. While 38% reported being familiar with the term, a slightly higher share (40%) said they were not familiar, and 23% were only somewhat familiar. This can be interpreted as although climate change is widely discussed, awareness and the ability to define climate change remain limited. On the categorization level, the three areas show similar patterns overall, but familiarity with climate change is highest in the most impacted districts, while the least impacted and other impacted districts have lower awareness and higher levels of unfamiliarity.

Figure 8: Awareness Level Across the Impacted Areas

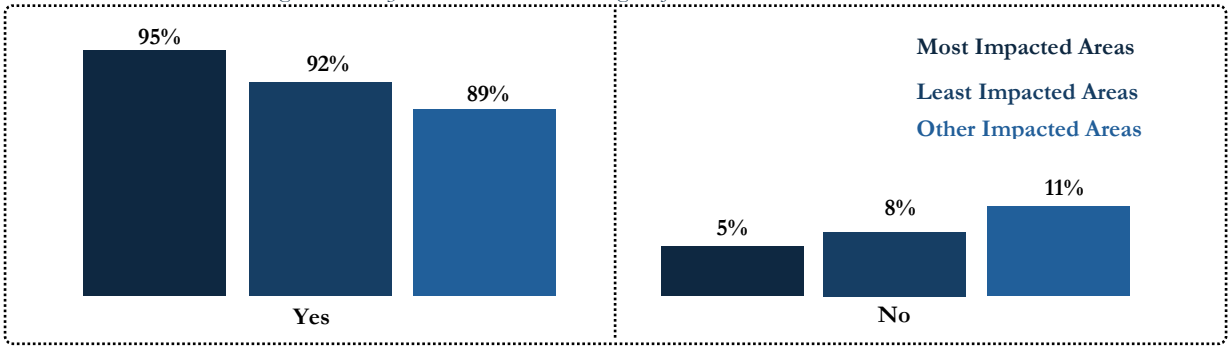


Several KIIs agreed with the survey findings, in which experts stated that public awareness remains surface-level and abstract, with many people not truly understanding what climate change means for them. This was supported by another perspective stated that *"while general environmental awareness might be relatively high, the disconnect remains."*[3] For instance, farmers often recognize challenges like reduced crop yields but "don't always attribute them to climate change,"[4] which indicates a gap in linking daily experiences to broader climate patterns. While other experts perceived awareness beyond that and saw that the core challenge is not about defining technical terms of climate change like mitigation, but in showing and enhancing a practical mindset that values everyday conservation of resources like water and energy.

The familiarity of the climate change term was followed by a question to define it. The respondents' definitions reflected scientific and lived experiences. Many associated climate change with changes in natural phenomena such as temperature changes, rainfall changes, drought, seasonal shifts, extreme and unstable weather. However, other respondents connected climate change to pollution and human impacts with referencing greenhouse gases, ozone layer depletion, and harmful emissions, while others focused on the climate change impact on resources and livelihood. For those who did not provide a clear definition, or considered themselves as not familiar or somewhat familiar, the enumerators explained the climate change term to them to ensure their understanding.

For respondents who were not familiar or somewhat familiar with the climate change term, 92% of them were able to relate the provided definition of climate change with the pre-observed natural phenomena, while 8% did not.

Figure 9: Ability to Link the Climate Change Definition to Pre-Observed Phenomena



[3] KII with GGGI representative. Amman. 14 April 2025.
[4] Ibid.

4.3. Climate Change Impact on Respondents' Daily Life

To ensure the survey respondents are able to link climate change with the observed changes in natural phenomena and its impact on their daily life. All 1,000 respondents were asked if they see any climate change impact on their daily life, 82% reported seeing an impact, whether through health, water supply, farming, or other aspects, while 18% stated that they do not see such impacts. Across all three areas, the majority of respondents reported that climate change impacts their daily lives; the proportion is highest in the most impacted districts (84%), followed by the least impacted (81%), and slightly lower in the other impacted districts (79%).

For those who observed an impact, it was revealed that the most prominent theme was water scarcity and declining quality, with many reporting frequent municipal water cut-offs, reliance on tanker water, and falling or saline wells. This was compounded by rising household costs, as families faced higher expenses for water, electricity, and food.

Also, agriculture and livestock emerged as especially vulnerable, with reports of lower crop yields (wheat, olives, watermelon), nursery losses, declining livestock and milk production, and rising pests and plant diseases. Daily routines were also disrupted; for instance, people avoided going outdoors at midday, faced commuting difficulties, and reported reduced or postponed working and teaching hours. Service disruptions such as power outages and weak water supply added further stress. Other impacts included damage to home gardening, declines in beekeeping, reduced tourism activity, and even migration considerations as families sought to cope with worsening conditions.

On the health side, respiratory illnesses, allergies, and skin conditions were commonly linked to dust storms, while heat-related illnesses such as exhaustion, dehydration, and lethargy were widely noted. As many have mentioned that these conditions also affected children's school attendance. Also, some mentioned mental health included stress, frustration, low mood, and isolation caused by extreme heat and dust.

4.3.1. Health Impact

Climate change poses threats to public health in Jordan, affecting physical, mental, and social well-being. The impacts are both direct, through exposure to heatwaves, floods, droughts, and deteriorating air and water quality, and indirect, as they exacerbate poverty, food insecurity, and strain on healthcare systems (OHCHR, 2016; MoEnv, 2022A). Vulnerable and marginalized groups such as low-income households, refugees, women, agricultural workers, and the elderly are disproportionately affected, bearing the greatest burden of climate-related health risks (El-Sharif and Muasher, 2024).

Survey findings revealed that respiratory problems are the most common health issue linked to climate change, with 83% of respondents reporting asthma, allergies, and bronchitis. Heat-related illnesses such as exhaustion and dehydration were also widely observed (36%), alongside mental health conditions like stress and anxiety (29%). A smaller share mentioned waterborne diseases (7%), while others pointed to additional conditions ranging from weakened immunity, skin, and gastrointestinal diseases to chronic illnesses such as diabetes and cancer, although there was no evidence to support this claim. The identified health issues were consistent across all three categories of districts, with respiratory illness as the most pressing health issue, followed by heat-related illnesses and psychological stress.

When asked about the most pressing health risks, respondents emphasized exposure to extreme heat (60%), respiratory conditions (57%), and the spread of diseases linked to shifting climate patterns (46%). Additional concerns were mentioned by respondents, highlighting that agricultural practices such as increased pesticide use were also linked to health risks. Also, the results show no major difference across the three areas, with extreme heat and disease spread consistently ranked as the most urgent health threats.

The conducted KIIs helped to explain these results, where experts from the World Health Organization (WHO) and the Institute for Family Health (IFH) confirmed that rising temperatures, especially in vulnerable areas such as the Jordan Valley, are directly driving cases of heatstroke, heat exhaustion, and even neurological seizures, while cold-related injuries such as frostbite were also noted. Likewise, reduced water availability and quality during floods were identified as pathways for foodborne and waterborne illnesses, including cholera. Experts further warned that shifts in temperature and humidity are enabling the

spread of new disease vectors, raising risks of climate-sensitive illnesses such as West Nile virus and cutaneous leishmaniasis, particularly in marginalized areas with weak health infrastructure.

Both KIIs and surveys pointed out that the health risks faced by outdoor workers, especially in agriculture and construction, are the most affected. Workers often suffer long hours in direct sunlight without breaks, protective equipment, or access to safe water, increasing their vulnerability to heat stress, skin diseases, and chemical exposure. Additionally, women in agriculture face exacerbated risks, including unsafe transport, lack of privacy in makeshift workplaces, and absence of hygiene facilities. Experts described this as a situation where workers face "visible signs of distress, but without employer accountability or enforcement mechanisms."[5]

Beyond immediate sickness, climate change has broader health consequences. Climate-related stress, frustration, and uncertainty were widely reported, particularly among refugees, displaced populations, and poor households. The links between extreme heat events and higher incidences of anxiety and depression, adding to the already limited availability of mental health services in Jordan (Tayseer, 2023). For instance, in refugee camps such as Zaatari, high temperatures worsen respiratory conditions, disrupt food storage due to power outages, and intensify psychological distress (El-Sharif and Muasher, 2024). Climate change also indirectly affects nutrition and food security, with reduced agricultural productivity lowering dietary quality and increasing risks of malnutrition, especially for children (Halaseh, 2024). Experts emphasized that reduced nutritional value in food is not just an economic issue but also a public health challenge.

These health effects highlight the urgent need for a resilient and adaptive healthcare system. Therefore, experts drew attention to the preparedness of Jordan's healthcare system, which is increasingly strained under climate stress, despite the Ministry of Health's (MoH) efforts in establishing a climate change unit and developing an adaptation plan. Experts pointed to insufficient community-level data, weak integration of climate variables into disease monitoring systems, and low awareness among health workers about climate-health linkages. As a result, localized vulnerability assessments are limited, leaving "poverty pockets" and marginalized areas underserved.

[5] KII with AWO. Amman. 23 April 2025.

5. Livelihood Impacts and Adaptation Measures

According to the Notre Dame Global Adaptation Index (ND-GAIN), Jordan ranks 74th out of 187 countries in 2023, with a vulnerability score of 51.0 (ND-GAIN, 2023). The index revealed that adaptation issues remain, although Jordan is well-positioned to adapt. Climate change exacerbates an already hard economic situation, which affects key economic sectors, and is noticed in many areas, including agriculture, food security, water resources, human health, migration patterns, transport, and industry among others (UNFPA, 2022). More specifically, the impacts of climate change are multi-sectoral, especially in water, agriculture, and tourism sectors that are linked to socio-economic conditions (Al Naber et al., 2023; Abu Sada et al., 2015).

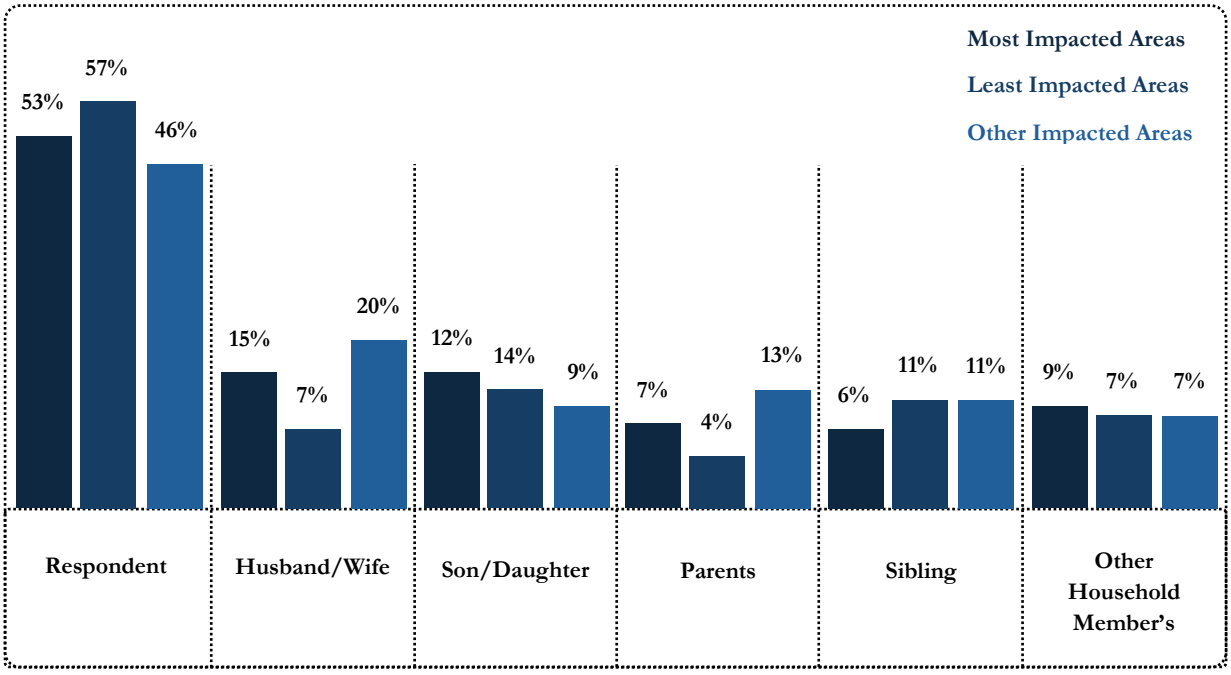
5.1. Job Loss and Change in a Changing Climate

Climate change is no longer a distant threat to livelihoods in Jordan; it is already impacting the economic stability of households and individuals, which in turn reshaping employment and income security across households. Therefore, this should be given high priority due its direct impact on achieving the EMV priorities including job creation and economic growth.[6]

Survey results reveal that while the majority of households (85%) reported no job change or loss in employment due to climate-related factors, 15% indicated that they or a household member had lost employment or shifted their jobs. The same trend was observed in the three areas, with the highest share being in the most impacted areas (18%), compared to 14% in the other impacted areas and 12% in the least impacted areas. It was reported that these job changes were negative, which reflected in changing sectors, reduced income, and lost the source of income.

Most of the employment changes or losses were experienced by the respondents themselves, with 51%, followed by spouses (15%), and their sons and/or daughters with 11%. Parents and siblings were each affected in 9% of cases, while 8% reported other household or extended family members. When looking at who in the household experienced a job change or loss, the respondents were the most commonly affected across all three areas. Overall, these findings pointed to negative employment disruptions rather than voluntary job shifts, which reflected that climate change is contributing to job insecurity, income loss, and reduced stability within households.

Figure 10: Household Members Experiencing Employment Change or Loss, by Area of Impact



[6] EMV focuses on four areas: economic reforms and investment, export growth, job creation, and economic growth.

Furthermore, climate change impacts on households, resulted in destroying agricultural livelihoods, increasing the cost of living, and shrinking economic opportunities. Experts reported that families dependent on small-scale agriculture are seeing their incomes collapse due to climate impacts like droughts and price fluctuations.

Among respondents and their household members who reported job loss or change, 55% had been working in agriculture, which reflects the sector's high vulnerability to drought, water scarcity, and heat stress. This was followed by industry (19%), and a smaller share of transport (6%) and tourism (4%). Very few reported job losses and changes in waste management, health, or energy (1% each). Other respondents (16%) highlighted other affected sectors, including vocational training and education, humanitarian/NGO work, construction, electrical equipment manufacturing, Heating, Ventilation, and Air Conditioning (HVAC) services, food preparation, house cleaning, photography, stone masonry, and security services.

Across all three areas, agriculture stands out as the most affected by climate-related job losses, particularly in the most impacted areas (60%) and other impacted areas (67%). In the least impacted areas, job change or losses were distributed more evenly, with agriculture (18%) and industry (36%), alongside transport (11%) and other service-related jobs.

5.2. Agriculture: Vulnerabilities, Impacts, and Adaptation

Agriculture remains one of the largest consumers of water, accounting for nearly 51% of Jordan's total water use (MWI, 2022). However, with precipitation patterns becoming increasingly erratic and groundwater resources being heavily over-extracted, where declining availability of water directly impacts irrigation, leading to disruptions in crop yields and posing a threat to food security, particularly for rural communities that rely on rain-fed farming (Bjerkestrand, 2022).

The consequences of water scarcity are its impact on agriculture and food security. Irrigated agriculture, which depends on surface and groundwater, faces growing challenges as water sources dwindle (MoEnv, 2022[A]). Many farmers in areas like Irbid, Jerash, and Ajloun have already been forced to leave their lands or switch to less water-intensive crops due to limited irrigation water, exacerbating rural poverty and potentially driving displacement toward urban areas like Amman, where water resources are more reliable (UNDP, 2022). Therefore, the impacts of climate change are particularly severe in districts with impaired water networks, where rising temperatures and more frequent heatwaves worsen water shortages and strain infrastructure (Haddad, 2023).

5.2.1. Observed Changes in Agriculture under Climate Pressure

The agriculture sector is highly vulnerable to the impacts of climate change, exacerbated by the socio-economic conditions that further strain its ability to adapt (Abu Sada et al., 2015). According to the experts, the increased soil erosion, prolonged and more frequent droughts, sharply rising temperatures, and altered rainfall patterns as key drivers of agricultural decline. Along with these factors, the sector is extremely vulnerable to instant climate shocks, such as a sudden frost that can destroy an entire harvest in a matter of days. As mentioned, these events play a huge role in declining the quantity and quality of agricultural products.

Additionally, the survey highlighted the agricultural changes reported by farmers and sector workers, with the most common being a decrease in crop yields (89%). This was followed by a greater need for irrigation or water management (52%), although the agricultural sector consumes about 50% of Jordan's water resources, which places significant pressure on the sector, especially as the availability of water declines (Perosino, 2023). Nearly half (48%) reported increased pest and disease outbreaks, which the geographic redistribution of pests and diseases pose new challenges to the sector (Haddad, 2023). While 41% of respondents noted shifts in planting or harvest seasons, and 35% experienced a reduction in soil quality or fertility. Another 9% reported other changes such as: some farmers mentioned total crop losses and lack of crop sales, while others highlighted the economic burden of rising pest control costs, veterinary fees, and animal feed prices. Additionally, the opening up of imports of crops grown locally was said to worsen farmers' losses by lowering market prices, compounding the challenges caused by environmental stressors.

Across all areas, decreased crop yields stand out as the most common agricultural change, reported by 89% of respondents in the most impacted areas and reaching as high as 95% in the other impacted areas. Even in the least impacted areas, two-thirds (67%) observed declining yields. Furthermore, the need for more irrigation or water management is also widespread, particularly in the other impacted areas (59%), followed by the least and most impacted (both 44 – 50%). Also, pest and disease outbreaks were another issue, reported by 55% in the other impacted areas and 44% and 33% in the most impacted areas and least impacted areas, respectively. Additionally, shifts in planting or harvest seasons were mentioned in all categories, with 50% in both the least and most impacted areas and 32% in the other impacted areas. Also, soil quality and fertility decline were more pronounced in the other (41%) and least (50%) impacted areas than in the most impacted areas (22%).

Building on the reported changes in agriculture, respondents pointed to temperature and precipitation shifts as major drivers of declining productivity. Overall, 74% indicated that these climatic changes have caused a severe decline in agricultural productivity, while 26% described the impact as moderate. Furthermore, patterns varied by categories, for instance, in the other impacted districts, the impacts were most seen, with 91% reporting severe productivity losses. In the most impacted districts, 67% observed severe declines, while 33% experienced only moderate challenges. In contrast, in the least impacted areas, the majority (67%) perceived the impacts as moderate, with only 33% reported severe losses.

5.2.2. Most Noticeable Changes Related to Water Resources

Water scarcity is among the most pressing consequences of climate change, with impacts cutting across environmental, infrastructural, and socio-economic dimensions. Jordan's renewable water recharge is under severe strain, with groundwater levels in six major basins declining by roughly one meter per year (FAO, 2020). Surface flows in the Jordan River, wadis, and the Dead Sea Basin have also dropped significantly, while six out of twelve groundwater basins are overexploited beyond their renewable capacity, leading to declining quality and the abandonment of wells. Therefore, climate projections warn of an 18% reduction in surface runoff and a 16% reduction in groundwater recharge (MoEnv, 2022[A]), which is expected to threaten agriculture and food security as irrigated land becomes harder to sustain.

The experts confirmed these findings, emphasizing that climate-driven shifts in rainfall patterns disrupt the natural replenishment of water resources. They noted two main factors: prolonged droughts, which shrink overall water availability, and intense short-lived storms, which create rapid runoff instead of slow aquifer recharge. As one expert explained, "Changes in rainfall quantity, timing, and runoff patterns have clearly hindered our ability to manage water effectively."[7] Experts further highlighted that the weakness of water infrastructure magnifies these stresses, especially in rural areas such as Mafraq, where piped networks are sparse or absent. In such places, households often depend on expensive water tank delivery, making water both less reliable and more costly.

Survey findings also highlighted these challenges at the community level. Across all three categories of districts, respondents consistently reported increased water scarcity during summer (57%), reduced groundwater access (52%), and higher costs for water (52%) as the most noticeable changes. In addition, reliance on water tank was widespread, particularly in the most impacted districts (50%) compared with roughly a third in the other areas. Although a smaller proportion (7%) mentioned increased use of treated wastewater, the majority of responses reinforced the perception of widespread scarcity as the defining issue.

5.2.3. Agriculture Vulnerability and Poverty

The vulnerability of the agricultural sector is closely linked to poverty rates, with around 40% of agricultural households considered poor (UNFPA, 2022). In fact, 17% of rural Jordanians live below the poverty line, compared to a national average of 14.4% (World Bank, 2018). The rural poor, who heavily depend on agriculture, are the most exposed to the adverse effects of climate change. As a result, factors like poverty impede access to modern irrigation systems and technologies that could mitigate the effects of extreme weather events (Al Naber et al., 2023). Consequently, agricultural communities suffer most acutely in vulnerable areas such as the northern Badia and the Jordan Valley.

[7] KII with World Bank. Amman. 08 April 2025.

Moreover, agriculture is central to the socio-economic fabric of Jordan, particularly in rural areas where many communities depend on farming for their livelihoods. However, poverty within the agricultural sector is high, with around 40% of households considered poor, and many of these families are unable to access advanced technologies or irrigation systems that could mitigate the effects of climate change (UNFPA, 2022). Rural women are particularly affected, as nearly half of rural Jordanian women work in agriculture, often as unpaid laborers on small and medium-sized family farms (AWC and UN Women, 2023).

KIIs showed that this reality is deeply felt by those farmers in the frontlines, who their lived experience tells them something has fundamentally changed, as many say, "The good old days are gone."[8] As a consequence, farmers are being forced to adapt, altering traditional cropping patterns, shifting their harvest times, and changing the crop types. Experts also observed that these changes have extended to livestock, where grazing land availability is decreasing and there has been a major documented decline in forage in the southern region.

The implications for agriculture are far-reaching. Although its official GDP contribution appears modest, Experts emphasized that agriculture is a cross-cutting sector, with an informal share estimated at 20% - 23% of GDP through backward and forward linkages to industries such as fertilizer production, plastics, steel, and food processing. This means that when agriculture is affected, the repercussions cascade across multiple value chains. For example, climate stress on tomato harvests undermines juice and paste production, while heat stress on poultry farms reverberates across the entire poultry industry. As a result, any climate-driven disruption to agriculture threatens farmers' livelihoods and poses wider economic and food security risks, including reduced nutritional value and higher household costs.

Therefore, market uncertainty, coupled with rising costs for raw materials, is making agriculture an increasingly vulnerable livelihood. The consequences are very noticeable and resulted in people leaving this sector after finding that farming could no longer provide a living, as a result, they moved to more stable jobs, a shift that contributes to higher unemployment rates in rural communities.

In addition to these challenges, the absence of financial assistance or compensation has further deepened the vulnerability of agricultural households. The majority of respondents (96%) reported that they had not received any form of support despite their sector being heavily affected by climate change, while only 4% indicated that they had. Access to assistance was found to be extremely limited across all categories: in the least impacted areas, no respondents reported receiving support, while in the most impacted areas (6%) and other impacted areas (5%), only a very small minority had benefited from any form of financial relief.

5.2.4. Farmers' Adaptation Measures for Resilience

Survey results reveal that farming households are adopting many measures to maintain income amid climate pressures. The most common measure, reported by 61% of respondents, was seeking alternative sources of income outside agriculture. Other adaptation measures included accessing loans or financial assistance programs (27%), scaling down operations to minimize production costs (23%), and changing crop or product types (16%). Participation in local support groups and farmer cooperatives was also noted (14%).

However, some strategies highlight the depth of socio-economic strain. About 11% of households involved more family members, including children, in agricultural labor to reduce costs. Another 5% reported pulling children out of school, while a similar share considered migration to areas with better opportunities. These negative coping mechanisms underline the severity of pressures on farming households, especially in the most and other impacted areas where climate risks are greatest.

Households also reported strategies to protect family members engaged in agricultural labor under climate stress. The most common measures were providing protective equipment (52%), followed by adjusting work hours to avoid peak heat or extreme weather (36%) and receiving safety training (25%). A smaller share (9%) relied on increased irrigation to reduce field risks, while 27% admitted taking no specific measures. The survey showed that the most impacted districts relied more on adjusting work hours (63%), while the least and other impacted areas, 67% and 64%, respectively, placed more focus on protective equipment and training.

[8] KII with Iksab Center for Sustainable Development. Amman. 27 March 2025.

KIIs showed that many farmers are pursuing technical solutions to adapt to shifting conditions, including water harvesting, smart irrigation, hydroponics, and soil amendments that reduce water consumption. Also, nature-based solutions, such as constructed wetlands using reeds to naturally treat wastewater for irrigating fodder crops, were highlighted as innovative practices. In parallel, some farmers have adopted renewable energy (especially solar panels) and new drought-resistant crop varieties as part of their resilience strategies.

At the economic level, adaptation has extended into market and value-chain approaches. Experts emphasized that value-added processing, branding, and packaging innovations can enhance the economic return of agricultural products. These measures increase marketability and stimulate the emergence of supporting businesses offering services such as wall construction, solar installation, and hydroponics system setup. However, Experts noted that adoption of such strategies is limited by the high upfront costs of sustainable technologies, leaving many smallholders unable to invest.

When adaptation within agriculture is inaccessible, many households turn to livelihood diversification or negative adaptation mechanisms. KIIs revealed that small farmers and daily wage workers are increasingly being pushed out of agriculture due to rising production costs, declining water availability, and the adoption of labor-saving technologies. This has led many, especially women, to pursue home-based enterprises, vocational training, and small-scale industries as alternative livelihoods. While these shifts provide short-term survival strategies, they also signify a structural transformation away from agriculture, raising concerns about rural poverty and long-term food security.

While the reported measures largely focus on household-level coping strategies, the findings also point to missed opportunities for stronger linkages with other agricultural stakeholders. Many respondents who sought alternative income or reduced agricultural operations indicated challenges related to market access, production costs, and limited coordination beyond the farm level, which showed that adaptation efforts could be more effective if complemented by broader interventions involving transportation and marketing systems, which remain outside the scope of most current household-level strategies. Strengthening these linkages would help reduce losses, improve income reliability, and align with national adaptation and donor priorities promoting climate-resilient value chains.

5.3. Tourism under Climate Stress: Risks, Drivers, and Adaptation

The tourism sector is often described as Jordan's oil due to its contribution to the national economy; however, this sector is highly vulnerable to the impacts of climate change (MoTA, 2022). Rising temperatures, erratic weather patterns, and reduced rainfall are altering tourism seasonality and diminishing the appeal of Jordan's natural landscapes. Interviewed experts highlighted that the tourism sector is particularly exposed to instant climate shocks, with the potential to "reduce tourism flows"[9] and thereby undermine employment opportunities, transport, and related services.

The vulnerability of tourism has already been tragically demonstrated. The frequency of extreme weather events, such as the deadly flash floods of 2018 in Wadi Zarqa Ma'in and Petra, exemplifies the severity of climate-induced risks. These events led to fatalities, forced thousands of tourists to evacuate, and caused significant economic losses (UNDP, 2023).

Also, it was observed that tourism destinations are facing gradual environmental changes. For instance, the Dead Sea is shrinking due to reduced water inflows and increased evaporation, threatening recreational activities and the area's unique biodiversity, which draws eco-tourists (MoTA, 2022). Likewise, Wadi Rum faces intensifying desertification, rising temperatures, and water scarcity (Bjerkestrabd, 2023), while urban destinations such as Amman are experiencing increasingly frequent heatwaves, with temperatures rising up to 43.5°C (Halaseh, 2024). Therefore, the climate shifts affect the number of tourists and have another impact on increasing the operational burden of tourism businesses, particularly as the sector consumes significant amounts of water and energy in one of the world's most water-scarce countries (MoEnv, 2021[B]; MoEnv, 2021[A]). Moreover, Jordan faces challenges in accommodating tourism's substantial demand for water, food, and energy. The Tourism Sector Green Growth National Action Plan (2021 – 2025) emphasizes the urgent need for sustainable practices to mitigate these impacts and enhance resilience within the sector (MoEnv, 2021[B]).

[9] KII with ILO. Amman. 27 March 2025.

The survey findings confirmed the observations; the majority of employed respondents in this sector (63%) reported a significant decline in visitor numbers in recent years, while smaller shares observed a moderate decline (13%) or no change (13%). Only a minority (13%) indicated an increase in visitors. On the area level, it was found that all respondents (100%) in the other impacted areas reported a significant decline. However, in the most impacted areas, 50% reported a significant decline, while the other half (50%) saw a moderate decline, while in the least impacted areas 60% observed a significant decline, 20% noted no change, and 20% reported an increase in visitor numbers.

Moreover, the respondents across all areas mentioned the drivers of this change, where high percentage pointed to rising temperatures and political instability (75% each) as the strongest influences. Extreme weather events and seasonal shifts in tourism activity (63% each) were also widely cited. Yet, on the area level, it was different; in the least impacted areas, 80% identified rising temperatures, 80% political instability, and 80% extreme weather events as key drivers, alongside 60% citing seasonal shifts and 60% economic crises. In the most impacted areas, 50% of respondents pointed to each of five drivers: rising temperatures, seasonal changes, extreme weather, political instability, and increased air pollution. Additionally, in the other impacted areas, 100% cited rising temperatures, political instability, seasonal changes, and economic crises.

The impact of climate change on tourism extends beyond visitor flows to affect the sector's overall sustainability. Across all areas, respondents highlighted declining visitor numbers due to unfavorable weather conditions as the most significant challenge (88%), rising operational costs, particularly linked to electricity and water use during hotter periods, were also widely reported (63%), in addition to damage to cultural heritage and natural sites (38%) and changes in tourist activities due to landscape shifts such as desertification (38%) were seen as growing threats. On the area level, these concerns were nearly unanimous in the most impacted (100%) and other impacted areas (100%), while in the least impacted areas, 80% cited visitor decline, 80% rising business costs, and 40% damage to sites.

5.3.1. Adaptation Measures for Resilience in Tourism

With growing climate risks, the tourism sector has begun adopting a mix of community-driven, institutional, and business-level adaptation measures to sustain livelihoods and safeguard visitor safety. At the community level, local communities have adopted several measures to mitigate the adverse effects of climate change on tourism and livelihoods. For instance, in water-scarce areas such as Wadi Rum, residents have implemented rainwater harvesting techniques to supplement water supplies. These efforts align with national initiatives encouraging efficient water use and reliance on renewable water sources to reduce dependence on non-renewable groundwater (Bjerkestrabd, 2023). In parallel, communities have turned to eco-tourism as a way to balance environmental conservation with economic benefits. For example, guided eco-tours in Wadi Rum and sustainable tourism programs near Petra have been promoted to diversify incomes while promoting conservation (UNDP, 2023).

Institutional and infrastructure-level responses have also been taken into consideration. Following the 2018 flash floods in Petra, which forced mass tourist evacuations and caused heavy economic losses (UNDP, 2023), local authorities and residents collaborated to improve early warning systems and invest in flood-resistant infrastructure. These measures included enhancing drainage networks, reinforcing roads, and upgrading emergency preparedness systems, aimed to reduce risks and ensure tourist safety (Halaseh, 2024).

Survey findings confirm that the tourism sector is adapting, though with significant variation across categories. The most common strategies include forming partnerships with other businesses (50%) and expanding to online services or tourism-related content (50%), which showed a shift toward collaboration and digital diversification. Other measures involved adjusting staff hours or relying on seasonal/unpaid family labor (38%) and offering new services such as eco-tourism or indoor activities (38%). A smaller share reported coping through family or community support (25%), while an equal share admitted to having no coping mechanisms at all (25%). It is worth mentioning that raising prices was not adopted, which reflected the limited flexibility of the tourism sector to cope.

When disaggregated by area, clear differences emerge, in the least impacted areas, the sector relied heavily on proactive measures, such as forming partnerships (80%), expanding online services (80%), introducing eco-tourism or indoor activities (60%), and adjusting staff hours (60%), while only 20% mentioned support from NGOs or government programs. In the most impacted areas, adaptation measures showed that half

relied on family/community support (50%) and half reported no measures (50%). In contrast, in the other impacted areas, all respondents stated that they had no adaptation measures.

As part of the adaptation measures, health and safety measures for staff and visitors during extreme weather showed that 63% of respondents reduced outdoor hours, implemented emergency response plans (63%), and provided training for staff (63%) were the most common actions. Half of the respondents also provided shaded or air-conditioned facilities (50%). However, 13% reported taking no specific measures. At the area level, in the least impacted areas, 80% reported reducing outdoor hours, training, and emergency planning, along with 60% offering shaded facilities. Additionally, most impacted areas reported similar, though lower levels of preparedness (50% each for most measures); however, all respondents in the other impacted areas reported no measures taken.

Furthermore, access to financial support remains almost non-existent. Overall, 88% of respondents reported receiving no financial assistance or compensation, despite climate change affecting their sector, while only 13% mentioned receiving support. By area, the least impacted areas showed minimal access, with 20% reporting support, while both the most impacted and other impacted areas mentioned no support.

5.4. Other Sectoral Vulnerabilities and Adaptation Measures

While agriculture, water, and tourism remain the most affected, climate change has an impact on other sectors. Survey results and expert interviews confirm that sectors such as manufacturing, garments, food production, energy, and health, among others, are vulnerable to climate-driven stressors, particularly through rising costs, resource scarcity, and operational instability.

Survey findings pointed out that nearly half of respondents who work in other sectors (49%) reported rising costs for accessing essential resources as the most common challenge, followed by seasonal fluctuations in resource access (40%) and resource shortages (30%), while 31% noted no significant changes, pointing to uneven distribution of impacts across districts. Area-level differences were also clear: in the least impacted areas, 54% highlighted higher costs and 53% reported seasonal fluctuations, whereas in the other impacted areas, resource shortages (31%) and the need for supplemental resources (14%) were more common. While in the most impacted areas, 52% cited rising costs, but 33% reported no noticeable changes. Respondents also raised other concerns, such as reduced rainfall, declining resource quality, reliance on imported raw materials, and even psychological stress linked to environmental insecurity.

When asked about the impact of environmental changes on operational stability and productivity, almost a third of respondents (29%) reported moderate impacts, facing occasional yet manageable disruptions, while 28% of respondents indicated significant impacts, describing frequent disruptions that affected stability. In contrast, 25% reported no impact, and 19% saw only mild effects. On the area level, the least impacted areas mentioned manageable challenges, with 37% reporting moderate impacts, while the most impacted areas were different, with 34% reporting no impact, while 29% faced significant disruption, and the other impacted areas showed more vulnerability, with 30% reporting significant disruptions and 28% moderate ones.

Expert interviews help explain these patterns. Unlike agriculture, which faces instant shocks from floods, droughts, and temperature extremes, other sectors are more exposed to long-term vulnerabilities tied to resource scarcity and energy fluctuations. Their heavy reliance on water and electricity makes them sensitive to climate-driven increases in energy costs and water shortages, even if the impacts are less immediately visible. For instance, the garment sector consumes both energy and water in production, making it difficult to transition toward greener practices despite efficiency gains from new technologies. Additionally, experts noted that these sectors can serve as incubators for long-term solutions, given their capacity to adopt modern, resource-efficient technologies on a large scale.

Informality further compounds these challenges, where experts identified informality in many key sectors, which rely on daily labor with no social protection or legal safeguards. For instance, one expert highlighted the informality in the waste management sector, where informal waste pickers collect valuable recyclables directly from dumpsters; however, their work creates a conflict with formal investment companies, leading the government to claim ownership of all waste in public bins legally. An under-implemented solution, suggested by experts, is to formally integrate these workers through partnerships and offer them financial compensation and legal protection by having them operate at designated collection centers.

Beyond industry, experts further pointed to the energy sector as impacted by climate change. The interconnectedness of the water and energy sectors was highlighted as a particular priority issue, with resource stress creating flow-on effects for national expenditure and sovereign debt.

5.4.1. Adaptation Measures for Resilience in Other Sectors

Households and workers across sectors are adopting several adaptation measures to sustain their livelihoods amid climate pressures. However, the findings show that these measures are unevenly distributed across areas and often insufficient to address challenges.

At the income level, the most common adaptation measure was seeking alternative income sources outside the primary sector, reported by 43% of respondents overall and especially common in the least impacted areas (66%). This was followed by reducing operational costs or scaling down activities (34%), mentioned by 60% of respondents in the least impacted areas, but by only about 21% in the most impacted and 18% other impacted areas. Also, reliance on loans or financial assistance was less common (19%), though present across all categories. In contrast, a significant share of households reported no coping strategies at all, particularly in the most impacted (38%) and other impacted areas (40%).

Furthermore, respondents also described qualitative adaptation measures reflecting both constraints and innovation. Households in the most impacted areas reported cutting consumption, reducing product prices, saving fuel, and diversifying products and packaging to maintain market presence. Others mentioned working online or purchasing refrigerators to extend the shelf life of goods. Meanwhile, in the least impacted districts, some respondents pursued more proactive strategies, such as establishing projects, aiming to integrate livelihood resilience, vocational training, and climate-focused interventions (e.g., one of the respondents established the Athmar Foundation for Empowerment and Vocational Training)

At the safety and health level, measures to protect workers in challenging environmental conditions were inconsistent. The most common measures included providing or using personal protective equipment (44%), adjusting work hours to avoid extreme conditions (31%), and accessing safety training from local organizations (26%). Area-level differences were striking: the least impacted areas reported higher adoption rates for personal protective equipment (59%), adjusted work hours (50%), and safety training or support from local organizations (56%), while the most impacted and other impacted areas are behind, with far lower uptake across all three measures. Additional responses included seeking education on safety, requesting drivers during extreme weather, or noting that administrative roles reduce direct exposure. The gaps mentioned highlight how the absence of systematic safety protocols leaves many workers highly vulnerable.

At the institutional support level, access to financial assistance or compensation for climate-related impacts remains extremely limited. Across all areas, 97% of respondents reported that they had not received any support, with only a very small fraction (2% - 8%) pointing out otherwise. Therefore, the lack of structured assistance compounds existing vulnerabilities, leaving households and businesses with a safety net.

5.5. When Adaptation Fails: Migration as the Last Option

Migration and relocation have emerged as coping mechanisms for households facing compounded effects of climate change and economic stress. While the majority of respondents indicated that relocation is not currently an option for them, the desk review and KIIs revealed that under worsening conditions, many households and communities would consider moving, either internally or abroad. Additionally, climate-induced migration is increasingly likely in Jordan, particularly among agricultural households whose livelihoods have been severely disrupted by water scarcity, rising temperatures, and crop failures (UNDP, 2022; AWC and UN Women, 2023).

Survey findings show that 75% of households reported relocation is not an option; however, 18% stated that while they had not relocated, they will consider doing so if conditions worsen. A small percentage of 7% reported already taking actions, where some relocated temporarily for seasonal work, others moved permanently to seek better opportunities, and the remaining described other approaches. Across all areas, most respondents reported that relocation is not an option, with this being highest among the least impacted (86%), followed by 71% of the most impacted and 73% of other impacted households. However, a notable

share indicated that they would consider relocating if conditions worsen, particularly among the most impacted (21%) and other impacted (20%), compared to just 8% of the least impacted.

Households that relocated reported an average of 2 moves per year, though the frequency varied sharply by area. Among the least impacted, relocation averaged once annually, usually short-term seasonal moves. In the most impacted districts, households relocated twice on average, while in the other impacted areas, the rate rose to 3.6 times, including one extreme case of 24 moves in a single year, which indicates instability and unstable livelihoods.

Furthermore, survey respondents also noted that community-level migration is common. Overall, 45% reported hearing of families in their communities who had migrated due to climate-related economic pressures. The differences between the three categories were notable: only 19% in the least impacted areas reported hearing of such migration, compared with 58% in the most impacted areas and 50% in the other impacted areas. The provided explanations of these migration decisions revealed shared triggers across categories: economic hardship, rising living costs, expensive rents, and lack of job opportunities. Climate-related stressors, including extreme heat, water scarcity, drought, and crop failure, were consistently highlighted, especially by farming households forced to abandon their land.

Survey respondents highlight that people are typically moving to nearby governorates or cities, such as Amman, Irbid, Karak, and Aqaba, for jobs or lower living costs, while others mentioned that migration was primarily driven by the collapse of agricultural livelihoods, with neighbors and relatives abandoning farming after repeated crop losses.

Experts confirmed that migration is increasingly viewed as a coping strategy when local adaptation options are limited. They also noted that some households have already moved to urban centers after agricultural incomes collapsed, while refugee families often migrate seasonally between the Jordan Valley and Mafraq, following crop cycles and temperature changes. Therefore, it can be seen how migration decisions are shaped by immediate financial pressures and by climate-sensitive livelihoods.

Reports further support this trend; for instance, the northwest governorates of Ajloun, Irbid, and Jerash were identified as vulnerable due to their high sensitivity and low adaptive capacity. It is estimated that around 15% of farmers in these areas may eventually abandon agriculture altogether and migrate to urban centers like Amman in search of more stable opportunities (UNDP, 2022). Also, farmers in the Jordan Valley have already migrated to other governorates after climate-induced crop failures caused severe financial losses, with many families seeking to secure better living conditions through alternative employment (AWC and UN Women, 2023).

5.6. Climate Change Impacts on Household Financial Stability

Climate change's impacts across Jordan's key sectors, especially agriculture, tourism, and industry, have increasingly translated into livelihood crises for households. As droughts, heatwaves, and erratic rainfall reduce crop yields, disrupt tourism flows, and raise energy and water costs, entire communities face shrinking job opportunities and declining incomes. These sectoral shocks are not isolated; they have an impact on the household economy, where they reshape employment security and income stability. Families now struggle to meet daily needs. Within this context, climate change becomes a socioeconomic issue, changing the financial stability and resilience of households.

This growing instability is reflected in the rising cost and accessibility of basic necessities, particularly food. Overall, 89% of respondents reported difficulties accessing food or coping with price increases due to frost waves, heatwaves, drought, or other climate shocks. Only 11% said they did not face these challenges. By area, the majority in the most impacted areas (93%) and the other impacted areas (91%) reported being affected, while even in the least impacted areas, 81% did so. Respondents described high increases in the cost of staples such as oil, sugar, rice, bread, meat, poultry, eggs, and vegetables. In the least impacted areas, families coped by cutting down on non-essentials and relying on aid. In the most impacted areas, stagnant incomes and crop damage forced families into severe adjustments such as drastically reducing consumption. The other impacted areas shared these difficulties and also emphasized structural drivers, including transport costs, import dependence, and global market inflation.

Survey findings revealed that 69% of respondents reported negative financial effects from climate change. Among these, 37% described the impact as severe, with major disruptions in income and household expenses, while 32% considered the effect moderate but ongoing. A smaller share (12%) reported mild effects, and 19% said they had not experienced any financial impact. Differences emerge across areas. In the least impacted areas, 47% described a moderate effect, while 25% faced severe impacts and 17% mild ones, with only 12% unaffected. In the most impacted areas, however, severe impacts dominated (41%), with a further 23% reporting moderate impacts, though 26% indicated no impact and 10% mild effects. The other impacted areas presented the most severe picture: 42% reported serious financial effects, 32% moderate, 11% mild, and only 15% unaffected.

KIIs reinforced these findings, with experts describing a cycle of low income and high expenses that reduces purchasing power. One expert noted that families who were once landowners of status are now "barely getting by."[10] The most vulnerable, they emphasized, are those who "do not have the ability to handle price fluctuations,"[11] highlighting how climate change is transforming both economic stability and social standing.

5.6.1. Household Coping Mechanisms

Across Jordan, households are employing a mix of preventive, adaptive, and, in some cases, harmful coping mechanisms. The financial pressures have a reflection in household budgets, where the most common coping mechanism was reducing household spending, reported by 78% of respondents overall. Other mechanisms included relying on aid or support (15%), taking on extra jobs (10%), and adopting diverse measures such as applying for grants, agricultural loans, renting property, or starting small businesses. Some households reported bridging gaps through savings, debt, or temporary informal work such as house cleaning. Yet, 33% stated they had not made any changes.

In the least impacted areas, coping mechanisms are relatively structured and preventive; for instance, households reported cutting overall spending, prioritizing essentials, buying smaller quantities, and switching to cheaper substitutes. Some also adopted long-term strategies such as meal planning, food preservation, energy conservation, or diversifying income through additional jobs. Also, reliance on aid and borrowing was common, though these were often combined with more proactive steps, such as producing goods at home for sale or even considering migration as a future option.

In contrast, in most impacted areas, households described far more reactive and severe coping mechanisms. Households often reduced food quantity and meal frequency, cooked in bulk to stretch resources, or depended heavily on home production. Economic survival was linked to additional jobs, side businesses, borrowing on credit, accumulating unpaid bills, and reliance on community aid or relatives. In more extreme cases, households reported children leaving school or university to work or going years without consuming basic foods like meat.

The other impacted households revealed even more vulnerability, often emphasizing bare survival. Respondents described buying only leftovers or low-quality products, relying on daily labor or extra shifts, and cutting essential expenses such as medicines or baby milk. Some openly admitted having no coping strategy at all, relying instead on patience, faith, or acceptance of hardship. Additionally, mental stress and fatigue were prominent, with households expressing frustration and resignation at their inability to manage beyond basic survival. Furthermore, experts identified the entry into informal jobs as a coping mechanism, which described as a survival strategy when the formal economy fails to provide secure opportunities. Households think if they choose this path, they will be able to generate income, yet it exposes them to heightened risks and long-term vulnerability.

They also noted that the widespread reliance on informality is less about a lack of awareness and more about systemic barriers. Workers often cannot afford the financial and bureaucratic costs of formalization, while employers, particularly in agriculture, resist it due to the administrative burden of permits and oversight. As a result, workers remain excluded from legal protection and social security. This "trap of informality"[12] limits their ability to recover from climate shocks and amplifies exposure to exploitation. In

[10] KII with NCFA. Amman. 24 April 2025.
[11] KII with Iksab Center for Sustainable Development. Amman. 27 March 2025.
[12] KII with ILO. Amman. 27 March 2025.

contrast, experts emphasized the role of social protection, where access to health insurance and safety nets provides both psychological stability and the economic space needed to engage in adaptation strategies, such as retraining for climate-resilient or green jobs.

However, coping strategies differ markedly across demographic groups, shaped by gender, age, socioeconomic status, and geography. Women, refugees, and migrants are particularly vulnerable, often relying heavily on informal work for survival. For instance, women are pushed into unsafe, unregulated jobs, where exploitation and lack of workplace protections are common, while refugees face structural barriers such as restricted access to work permits, limited mobility, and exclusion from banking services, all of which restrict their financial stability and force them into informal labor markets. Also, migrants joining insecure urban sectors were described as highly exposed to GBV and economic exploitation, and this how informality increase both economic and protection risks.

In contrast, another demographic challenge emerges among older male farmers, whose vulnerability stems not from exclusion but from entrenched tradition. Many farmers continue to rely on inherited farming practices and are reluctant to adopt new, climate-resilient methods. As one expert explained, they "inherited their practices, ideas, and convictions from their fathers and grandfathers, and they stick to them," making behavioral change and adaptation extremely difficult. The generational resistance highlights that vulnerability is not uniform, while women, refugees, and migrants are marginalized by systemic barriers, older farmers are limited by cultural and generational attachments.

6. Protection Concerns & Coping Mechanisms

The relationship between climate change and protection concerns is not direct; however, it is interlinked, with intensifying pre-existing vulnerabilities such as poverty, unemployment, and weak social safety nets. When livelihoods collapse or households' resources start being under more pressure, they are pushed into crisis mode, where survival pressures lead to harmful coping mechanisms.

An expert stressed that causality in social issues is never linear. As he explained, "We always say there is no direct causality. Causal relationships in social issues are illogical. These are contributing factors, not causes."[13] Poverty, drought, or heat do not automatically cause violence or early marriage; instead, they serve as powerful stressors that, when combined with existing vulnerabilities and rooted social norms, increase the probability of harmful outcomes.

In this context, child labor and GBV (including early marriage) should not be seen as inevitable outcomes of climate change itself, but rather as symptoms of the socio-economic stress it amplifies. The experts strongly support this argument, in which they mentioned that the intermediary factor linking climate change to protection concerns is the loss of livelihoods, which creates a household-level crisis. When families experience income loss from events such as crop failure, the risks of child labor, early marriage, unsafe migration, and GBV increase. For GBV in particular, experts stated that women, who are often responsible for managing household resources, face heightened domestic conflict and violence when they are unable to meet family needs due to climate-economic stress.

These compounding stressors are clearly reflected in the protection concerns reported by respondents, who identified several risks that have intensified under growing financial and social pressures. The most common were heightened risks of exploitation in the workplace (39%) and domestic violence (38%), which increase as household tensions rise under financial strain. Migration (33%) was also widely reported, with families moving internally, often disrupting children's education and family cohesion. While less frequent, respondents also pointed to increased crime and insecurity (4%), drug and substance abuse (2%), family separation (3%), and, in rare cases, child begging, homelessness, or even suicide/self-harm (1%).

6.1. Climate Change, Economic Stress, and Household Dynamics

Since climate change leads to protection concerns, it intensifies household and community stressors that already exist. Survey results show that coping with climate-related economic pressures within affected families is changing family relationships and creating tensions; a large majority of respondents (80%) reported noticeable changes in relationships or tensions within households due to climate-linked economic strain. Even in the least impacted areas, 67% observed such changes in relationships and tensions, while the proportions were higher in most and other impacted areas (83% and 84%, respectively).

Similarly, 75% of respondents noted shifts in how families cope with these challenges, ranging from changes in caregiving roles to changes decision-making patterns. Respondents in the most and other impacted areas reported noticeable shifts and changes, with 80% and 78%, respectively. However, in the least impacted areas 61% observed these shifts and changes.

The most reported home life challenges that households faced due to the negative effect of climate change were increased household strain and tension, reported by 88%, followed by serious conflicts with family members (77%) and, in many cases, domestic violence and abuse, which was reported by 22% of households. Beyond households, disputes with neighbors and communities were also noted (44%), which may be linked to resource scarcity and financial obligations. In a smaller share of cases, families reported changes to their structure: 6% mentioned a shift in caregiving roles with younger members stepping in as caregivers instead of their parents, while another 6% experienced a change in family structure, such as one member leaving to seek economic opportunities.

Although a very small minority reported no changes (1%) or preferred not to answer (<1%), 8% pointed to other challenges, including marital breakdowns, divorce, and reduced participation in social and community events, they also highlighted psychological strain, with rising levels of stress, depression, and tension, particularly among youth facing unemployment. In addition to that, respondents mentioned that

[13] KII with NCFA. Amman. 24 April 2025.

climate-related financial strain led families to borrow money, while in more severe cases, it led to theft, drug dealing, or other harmful coping mechanisms.

The three impacted areas are experiencing similar pressures such as household tension, family conflict, and social withdrawal, the severity and expression of these challenges vary: the other impacted show higher levels of domestic violence (22%), while the least impacted, despite facing comparatively lower risks, report higher community-level disputes (42%), which may be seen as that climate and economic stressors affect families in overlapping but context-specific ways.

6.1.1. Shifts in Household Roles and Decision-Making

The survey results show that financial and climate-related pressures are reshaping household dynamics in the surveyed districts, particularly in decision-making roles and the distribution of responsibilities. Overall, 40% of households reported a change in who makes major decisions, while 60% indicated no change. This disruption was most notable among the most impacted areas (44%), followed by other impacted areas (39%) and the least impacted areas (36%). Although the majority across all categories reported no shift, the presence of reported change, especially in the most impacted areas, indicates how increasing pressures destabilize traditional family structures.

In terms of changes that have occurred in household roles and responsibilities, 78% of households reported women taking on more hazardous or labor-intensive work; in parallel, 70% of households indicated that women had become the primary decision-makers in managing household resources. This trend was higher in the least impacted areas (96% reported increased hazardous work and 89% women decision-makers), somewhat lower but still high in most impacted areas (70% and 61% respectively), and consistent in other impacted areas (77% and 70%). Therefore, regardless of climate exposure, women are increasingly carrying a double burden of economic survival and decision-making, often at the expense of their own well-being.

These shifts are compounded by changing male roles within the household. As climate-related income losses intensify, 11% of households reported the migration of fathers or male guardians for work. This pattern was highest in the other impacted areas, 20% of households, compared to 7% in the most impacted and 5% in the least impacted, leaving women as heads of households. Furthermore, extended family members, particularly grandparents or uncles, assumed decision-making responsibilities in 7% overall, while in 12% of households in the most impacted areas and 6% in the other impacted group. Seasonal adjustments in responsibilities were also reported, especially during harvest periods, with 4% overall noting such changes, peaking at 6% in the least impacted and 5% in the most impacted areas.

In addition, children's responsibilities within households have also evolved as part of families' adaptation to climate and economic pressures. School dropout rates linked to economic strain were reported by 12%, in particular, 13% of households in both the least and most impacted areas, and 11% in other impacted areas. Additionally, children were left unsupervised for long periods, reported by 7%, with 14% in the least impacted areas compared to 6% in the most impacted and 4% in other impacted areas. Also, 11% reported that older siblings were frequently tasked with caring for younger children, with this practice highest in the most impacted areas (14%). A small share of families (1% – 4%) also relied on extended family members to provide childcare.

Experts strongly reinforce these patterns by explaining how climate-induced economic stress feeds into household crises, calling GBV a silent killer that weakens communities from within. They explained that climate stress can exacerbate domestic conflict, particularly when women, who are typically responsible for managing household resources, struggle to meet their families' needs.

6.2. Vulnerable Groups and Protection Risks

Climate change disproportionately affects women, children, refugees, the elderly, and persons with disabilities (PwDs), especially in "poverty pockets," remote rural areas, the Jordan Valley, and refugee camps, where weak living conditions amplify exposure to risks (FAO, 2020; UNFPA, 2022). Women's heavy reliance on climate-sensitive sectors like agriculture and water management makes them specially vulnerable: reduced precipitation, drought, and crop failure undermine their roles in ensuring food security and household income.

Nearly half of rural Jordanian women work in agriculture, often unpaid and without legal or social protection, leaving them highly exposed to exploitation when climate shocks occur (AWC & UN Women, 2023). Experts described these working conditions as "heartbreaking,"[14] including exploitative wages as low as 1.5 JOD per day, a lack of toilets and clean water on farms, and an absence of health insurance or contracts.

For children, the protection risks are also notable. During climate crises, diminished resources and economic insecurity heighten family tensions, which can result in child labor and early marriage as negative coping mechanisms (UNFPA, 2022). Survey results support this with households reporting children dropping out of school to work (12%), older siblings taking on caregiving duties (11%), and, in some cases, children left unsupervised for long periods.

6.2.1. What Happens to Children When Families Struggle with Climate Stress?

Climate-induced economic pressures are reshaping children's roles within households. Survey findings reveal that while 66% of families reported no changes in children's responsibilities, 34% noted new or increased pressures on children as part of coping strategies. The most common change was a reliance on extended family members (such as grandparents, aunts, or neighbors) for childcare (16%), reflecting the strain on parents and disruption of family routines. Additionally, 6% of households reported that children now assist with household or agricultural tasks after school, 4% said their children contribute directly to household income, and 3% reported school dropouts linked to financial stress.

These shifts were most evident in the most impacted areas, as reported by 49%, while the vast majority of respondents in the least and other impacted areas reported no changes in children's responsibilities (87%, 69%, respectively). In the most impacted areas, 23% of them reported that reliance on extended family for childcare rose sharply, while 10% of children engaged in additional household or field tasks, 5% contributed to income, 4% dropped out of school, and 7% described that children experiencing psychological pressures such as fatigue, hunger, reduced academic performance, and stigma linked to having less spending money than peers, and in some cases, children missed school due to extreme weather or health issues, while children with special needs were particularly disadvantaged, often excluded from school entirely due to financial or health-related barriers.

These patterns illustrate how climate-related economic hardship amplifies protection risks across Jordanian households and communities. Survey results show that the most serious concerns are placed on children's well-being and household stability. Child labor (49%) and school dropout (43%) were the two most commonly reported issues, which reflects the idea that families often pull children into work as a coping mechanism at the expense of education. Also, child marriage (41%) emerged as a concern, which may be used as a harmful coping strategy when economic pressures intensify.

6.2.1.1. Education Disruption and Child Labor Risks

Despite these challenges, school enrollment rates remain high. Among the households with school-age children, 94% reported full enrollment, 5% partial enrollment, and only 1% none at all. Enrollment was nearly widespread in the least impacted areas, with 99%, in the other impacted areas, the percentage was 94%, and 92% in the most impacted areas. However, maintaining enrollment does not mean uninterrupted schooling, where survey results show that 84% of children continued to attend school regularly, but 6% had dropped out, and 9% missed school occasionally to help with family work. Also, disruptions were most pronounced in the most impacted areas, where 79% of children maintained regular attendance, while 7% dropped out and 11% missed school to contribute to household labor. Families described children missing school due to exhaustion, long commutes, or inability to afford private lessons, while those with special needs were often excluded from appropriate education.

Experts stressed that child labor is increasingly used as a "survival logic" for households facing climate-induced economic shocks. When livelihoods collapse due to crop failure, heatwaves, or water scarcity, families often drop children out of school to increase income. This work is frequently hazardous because when children work in agriculture, construction, or informal waste collection for recycling purposes, particularly in refugee camps such as Zaatari, they are exposed to pesticides, extreme weather, overcrowded

[14] KII with NARC. Amman. 09 April 2025.

transport, and exploitation. Survey respondents also revealed cases of children employed in factories or agricultural work during school breaks, sometimes under unsafe conditions, such as this case with a girl with asthma prevented from using her inhaler in a clothing factory. Furthermore, one expert put it, this is often "a matter of life or death."[15] The consequences are devastating due to taking children's right to education away from them, and it somehow creates cycles of poverty, with some growing up without basic literacy.

6.2.2. Pressured Choices: Early Marriage

Survey results reveal that social perceptions of acceptable marriage ages remain varied across impacted areas. For women, the average minimum acceptable age was 22.9 years, with slight differences between areas: 23.1 years in the least impacted districts, and 22.8 years in both the most and other impacted districts. However, some respondents across all categories identified ages 14 – 17 as acceptable, which showed that early marriage norms exist in certain segments of society. For men, the average minimum acceptable age was 27.8 years, with a slightly higher average in the least impacted areas, 28.6 years, compared to 27.5 in the most impacted and 27.7 in other areas, although most responses were around the mid-to-late 20s.

The survey also found that 49% of respondents reported that people in their area have considered early marriage, as a way to cope with climate-related financial challenges, while 52% said no. This pattern is uneven across areas; for instance, in the least impacted areas, 40% reported early marriage as a coping mechanism, while in the most impacted and other impacted areas, a majority (51%) acknowledged it as an option.

Experts confirm these findings, describing early marriage as a harmful coping mechanism that families resort to under severe economic stress. In contexts where livelihoods collapse due to climate-driven pressures, such as crop failures, heatwaves, or water scarcity, marriage may be seen as a way to reduce household expenses or shift financial responsibility. Some experts also pointed to a potential physiological dimension, noting that rising temperatures in areas like the Jordan Valley may contribute to earlier puberty, which could intersect with prevailing social beliefs to reinforce early marriage practices.

[15] KII with Oxfam. Amman. 25 March 2025.

7. Green Pathways for Resilience and Livelihoods

Across Jordan, green entrepreneurship, employment, and community-led practices are recognized as a necessity and an opportunity to adapt to the impacts of climate change. While awareness remains limited, there is growing acknowledgement that sustainability-focused activities can address urgent livelihood challenges while fostering long-term resilience.

7.1. Awareness Level

The survey and KIIs' findings highlight that awareness remains "surface-level and abstract,"[16] with only 20% of survey respondents reported being aware of the green practices as a concept, such as green entrepreneurship, employment, or related initiatives (and the remaining 80% were unaware), with no difference among the most, least, and other impacted areas, where the levels of awareness were 23%, 22%, and 16%, respectively. In light of this and to ensure consistent responses, enumerators clarified the meaning of green entrepreneurship and enterprises, drawing on combined definitions from GGGI and ILO, which is "the creation and development of economic projects that combine profit and environmental protection, by using natural resources efficiently and responsibly, and relying on innovation and environment-friendly technologies to promote sustainability and reduce environmental impact." Following this clarification, 29% of unaware respondents were able to identify examples of green entrepreneurship, employment, or practices within their areas, which raised the overall level of awareness to 49% of respondents, with 51%, 48%, and 47% in the most, least, and other impacted areas, respectively.

Experts view awareness as the foundation step needed to introduce concepts, green technologies, and other adaptation measures, including greenhouse agriculture, rainwater harvesting, recycling, and renewable energy, among others.

7.2. Promising Green Sectors for Employment and Entrepreneurship

Survey findings highlighted the green sectors that have potential to create both employment and entrepreneurship opportunities in Jordan. for employment, sustainable agriculture emerged as the most frequently reported sector, reported by 52% of respondents. This was followed by renewable energy (40%), recycling and waste management (35%), eco-tourism (16%) and water resource management (11%). A smaller percentage of respondents (6%) highlighted other employment opportunities such as environment-friendly handicrafts, productive kitchens, and other industrial activities.

On the level of impacted areas, notable differences appeared. For instance, in the least impacted areas, renewable energy (49%) and recycling and waste management (43%) were prioritized, with eco-tourism (31%) considered more in demand compared to other areas. In the most impacted areas, sustainable agriculture dominated (65%), followed by renewable energy (40%) and waste management (30%), while water resource management (19%) was emphasized due to severe water scarcity. In the other impacted areas, sustainable agriculture (59%) remained high, with renewable energy (34%) and waste management (34%) also prominent, while eco-tourism (17%) was moderately in demand.

When asked about the most promising sectors for green entrepreneurship, sustainable agriculture was again dominant (54%), given its role in supporting household resilience and ability to further improve already established businesses. Other respondents focused on sectors such as renewable energy (38%) and recycling and waste management (37%) were also seen promising for enterprise creation. Also, eco-tourism (20%) and water resource management (11%) were mentioned as additional opportunities.

Variations were evident across the three areas; for instance, in the least impacted areas, recycling and waste management (56%), renewable energy (48%), and eco-tourism (48%) were prioritized, while sustainable agriculture (31%) was less prioritized. In the most impacted areas, sustainable agriculture (61%) was clearly dominant, followed by renewable energy (38%) waste management (31%), and eco-tourism was less relevant (5%. In the other impacted areas, sustainable agriculture (61%) was again dominant, with waste management (33%) and renewable energy (32%) following, and eco-tourism (19%) of moderate demand.

[16] KII with Iksab Center for Sustainable Development. Amman. 27 March 2025.

7.3. Community Engagement in Green Practices

The survey and KIIs findings showed that while community engagement in green practices among the different areas are uneven. Half of the survey respondents (50%) reported active involvement in green practices, entrepreneurship, or employment, while the other half (50%) stated they were not engaged. This balance slightly varied across areas, where in the least impacted areas, 58% of respondents reported engagement, compared to 50% in the most impacted and 44% in the other impacted areas.

Despite these differences in involvement in green practices, willingness to adopt environment-friendly practices was almost unified. Overall, 97% of respondents expressed readiness to adopt environment-friendly practices, with 100% in the least impacted, 94% in the most impacted, and 97% in the other impacted areas.

When asked to identify the green practices adopted within the different economical sector, which have had positive impact on the environment and on improving household livelihoods and economic resilience, different practices were mentioned under the different sectors, for instance, under the sustainable agriculture and household farming, cultivating crops in greenhouses, rooftop gardens, hydroponics, using organic fertilizers, composting, reduced pesticide use, using water-saving practices (such as greywater reuse), and rainwater harvesting, were all widely adopted practices, particularly in areas mostly impacted by water scarcity.

Alongside agriculture, renewable energy solutions were emphasized, including the installation of solar panels, solar water heaters, and energy-efficient appliances, and were all described as transformative practices in reducing household electricity costs and dependence on fossil fuels. While many respondents cited environmental benefits, the primary driver for adoption was often economic savings, showing the dual incentives of resilience and affordability.

Furthermore, for waste management sector, recycling and upcycling practices were reported, where respondents mentioned recycling plastics, glass, cardboard, textiles, and organic residues, which were repurposed into soaps, candles, insulation, furniture, and decorative crafts. it's worth mentioning that, waste management efforts extended beyond households, to include community recycling centers, e-waste projects, composting agricultural waste, and organized clean-up campaigns, which respondents linked to greater environmental awareness and occasional job creation.

Experts reinforced these findings, stressing that the most effective green practices must be resource-focused and locally implemented. As mentioned, water conservation was highlighted as a cornerstone of adaptation, with rainwater harvesting systems and improved water storage widely noted. Likewise, greenhouse agriculture was seen as a highly efficient and increasingly popular approach, helping farmers maintain production despite declining rainfall. Also, planting drought-resistant trees was also mentioned as a dual solution, both generating income and reducing local heat stress. Furthermore, at the household level, the use of renewable energy, particularly solar PV, is highlighted as a critical tool that enables families, and especially women, to cope with the dual challenges of extreme heat and high electricity prices

7.4. Challenges and Support Needed for Scaling Green Practices

Survey findings reveal that households face overlapping barriers that limit their ability to adopt or expand green practices in entrepreneurship and employment. The most pressing challenge, reported by 86% of respondents, is limited financial resources, where many households and small entrepreneurs lack access to affordable loans, grants, or subsidies and struggle with the high costs of equipment. It was also emphasized that without sustained financial support, even existing initiatives risk failure.

on the other hand, weak local infrastructure was reported by 38% of respondents, while 35% pointed to limited market opportunities and 32% identified gaps in technical knowledge and skills. A smaller share (6%) highlighted other obstacles, including institutional bureaucracy, water scarcity, and cultural stigma, all of which hinder broader engagement.

Looking more closely at the three areas, financial constraints remain the most pressing concern across all groups, with 95% of respondents in the least impacted areas, 90% in the other impacted areas, and 89% in the most impacted areas citing it as a major barrier. Weak infrastructure was also a recurring issue, particularly in the least impacted areas (53%), compared to 40% in the other impacted areas and 36% in the

most impacted. Gaps in technical knowledge were reported by 40% of households in the least impacted areas and 37% in the most impacted, while only 19% of respondents in the other impacted districts identified this as a challenge. Market access was another important constraint, though less frequently mentioned, with 35% of respondents in the most impacted areas, 33% in the other impacted areas, and 22% in the least impacted, pointing to the difficulty of connecting green products and services to reliable markets.

Despite these barriers, survey respondents suggested different support areas to create an enabling environment, including financial support, which emerged as the single most critical need, highlighted by 91% of respondents. Respondents stressed the importance of accessible grants, loans, and subsidies to offset high start-up costs and sustain existing green practices. Alongside this, nearly half (46%) identified technical training and capacity-building as essential for strengthening knowledge of modern agricultural practices, renewable energy, recycling, and marketing methods. Improved infrastructure was also prioritized by 42%, particularly for waste management, energy supply, and transportation, while 31% pointed to the need for market access facilitation, including better marketing channels and fair pricing systems. Finally, 28% emphasized the role of supportive government policies, such as subsidies, incentives, and simplified procedures, to reduce bureaucratic hurdles.

Experts expanded on these findings, stressing that the key to scaling green practices lies in both addressing barriers and unlocking opportunities. Despite these issues, several promising opportunities exist; the primary opportunity lies in working with the informal sector rather than against it, where its internal governance systems and adaptability can be leveraged to pilot and incubate low-cost, locally driven climate solutions. Beyond leveraging existing systems, there is an opportunity to focus on process-level greening by moving beyond simple recycling to transform entire industrial processes, such as using efficient machinery in textile dyeing or localizing supply chains to reduce transport emissions.

8. Future Projections and Preparations to Enhance Resilience

Looking ahead, it is evident that resilience to climate change in Jordan requires a multi-level approach that integrates household practices, community systems, and national policy. Survey and KIIs findings highlight a strong demand for financial, technical, and institutional support to enable households and communities to withstand intensifying climate shocks, especially with its implications on livelihood and protection.

8.1. Household and Community-Level Preparations

When asked respondents on additional support or resources would help them and their community to become stronger and better prepared to cope with climate impacts; 81% of respondents reported financial support to adapt to climate change through grants, loans, or subsidies. The demand for financial support was broadly consistent across the three areas of impact, with 45% in other impacted areas, 44% in the least impacted areas, and 38% in the most impacted areas, highlighting this as a top priority.

Similarly, 41% of respondents overall highlighted stronger infrastructure to withstand extreme weather as a pressing requirement (e.g. rehabilitation of poor houses' roofs, increasing wall insulation, external shading structures, etc.). This need was strongest among households in the least impacted areas (47%), compared to 42% in other impacted areas and 34% in the most impacted areas.

Beyond these immediate needs, households suggested practical solutions such as subsidized electricity and water bills, access to affordable renewable energy, expansion of water collection systems, and localized recycling programs. These priorities align closely with experts' recommendations for resource-focused interventions such as greywater reuse, rainwater harvesting, and nature-based solutions that can be scaled across households, schools, and community facilities. Such alignment between household needs and expert strategies suggests that future programs can achieve stronger uptake if they are tailored to local realities while backed by technical expertise.

8.2. Livelihood, Employment, and Green Growth

Achieving resilience may lie in securing livelihoods and diversifying income sources. Survey results show that households strongly prioritize the development of local green businesses and employment opportunities, with 85% overall identifying this as a top need, especially for youth and women. When broken down by area, the priority remains consistently high across all areas: 78% in the least impacted areas, 86% in the most impacted areas, and 87% in the other impacted areas.

Experts highlighted economic empowerment as an important component of resilience, which involves providing sub-grants to green enterprises, supporting youth entrepreneurs, and developing innovative agritourism models that create new income streams for rural women, and from respondents' point of view, they called for fairer access to stable jobs, better wages, and stronger support for women-led and home-based businesses. Similarly, experts emphasized the concept of a "Just Transition," ensuring that new jobs in renewable energy, sustainable agriculture, and green industries are both accessible and equitable, supported by targeted skills training and policy dialogue.

8.3. Social Protection and Well-Being

Future preparedness is not only about physical infrastructure or technology; however, it should also be about addressing psychosocial vulnerabilities. Since stresses resulted from climate-related income loss have increased anxiety, domestic conflict, and health challenges, especially among women and vulnerable families, experts pointed to the establishment of strong social protection systems, such as cash transfers, health insurance, and unemployment benefits. Surveyed households agreed with this; they requested targeted support for orphans, retirees, and families with children with special needs, alongside healthcare for asthma patients and those with chronic illnesses worsened by the changing climate. Furthermore, creating safe, dignified, and non-exploitative working environments, particularly for women in agriculture and informal labor, is an overlooked but important aspect of building psychological resilience.

8.3.1. Education, Awareness, and Community Empowerment

Embedding climate awareness into daily life was repeatedly highlighted as a long-term investment. According to the survey, 48% of respondents overall called for education and skills development programs on sustainable practices and climate adaptation. This priority was most emphasized in the least impacted

areas (58%), followed by the most impacted areas (49%), and somewhat lower in other impacted areas (41%). Communities further requested training in sustainable agriculture, project management, and household sustainability practices such as recycling and home gardening.

Experts reinforced this point, stressing the importance of integrating climate education into school curricula and vocational training for youth and women. At the community level, awareness campaigns could cover issues such as planting orchards, mosquito control, and resource-saving practices. Both experts and households agreed that resilience strategies will only succeed if communities have ownership. Co-designing projects with local communities, based on their knowledge and evolving needs, ensures greater buy-in, long-term relevance, and sustainability.

8.4. Governance, Policy, and Coordination

Survey results show that 35% of households overall prioritize stronger partnerships between local governments, NGOs, and communities, and another 35% call for enhanced community participation in planning and decision-making. These findings reflect growing recognition that governance and coordination are essential for resilience. When broken down by area, the importance of building partnerships was emphasized most in the least impacted areas with 33%, 22% in other impacted areas, and only 37% in the most impacted areas. Similarly, enhancing community participation in planning and decision-making was a higher priority in the most impacted areas (38%) and other impacted areas (37%), while 28% in the least impacted areas.

Experts highlighted persistent barriers such as siloed planning, bureaucratic inefficiencies, and weak enforcement of environmental regulations. They warned that strong laws are ineffective without monitoring and compliance mechanisms at the municipal and community levels. Similarly, households called for reforms in work permits, grant eligibility, and aid distribution to ensure fairness and inclusiveness. Experts further emphasized the need to standardize definitions, such as what constitutes a green job, to avoid fragmentation across ministries and NGOs.

Therefore, future programs should prioritize decentralized and diversified funding streams, establish national support funds independent of donor cycles, and build inclusive partnerships connecting local authorities, NGOs, and communities.

8.4.1. Data, Evidence, and Tailored Interventions

A recurring theme across KIIs is the role of data and shared understanding in shaping future resilience. Many programs currently lack a strong evidence base, leading to duplication of efforts and wasted resources. Experts strongly advocated for the establishment of a national climate and social vulnerability database with standardized indicators to identify hotspots for risks such as water scarcity, food insecurity, or early marriage.

Survey results also pointed to the need for enhanced infrastructure and disaster preparedness plans (42% overall). This priority was strongest in the least impacted areas (55%), compared to 39% in other impacted areas and 37% in the most impacted areas. Similarly, building strong community networks and support systems (29% overall) was emphasized most in the least impacted areas (43%), while it was less of a priority in the most impacted (24%) and other impacted areas (25%).

However, achieving these priorities requires reliable data to guide targeting and resource allocation. Shared platforms can improve transparency, reduce inefficiencies, and enable collaborative planning across sectors. Establishing such a system will ensure that resilience programming moves beyond ad hoc projects toward an evidence-driven national framework.

9. Recommendations

In conclusion, future resilience depends on a careful balance between technical adaptation, economic empowerment, social protection, and institutional reform. While households prioritize immediate support, loans, grants, technologies, and infrastructure, experts call for structural changes in governance, education, and financing. The difference between these perspectives suggests that resilience cannot be achieved through isolated interventions; rather, it requires systemic, participatory, and evidence-driven strategies. Moving forward, Jordan's capacity to cope with climate impacts will hinge on whether it can bridge the gap between national policy and local realities, decentralize resources to empower communities, and foster partnerships that cut across sectors and scales.

To the Government of Jordan:

Education & Awareness:

- The Ministry of Education (MoE) and the Ministry of Higher Education and Scientific Research (MoHESR) should integrate environmental education, and green economic concepts across school and university curricula to build students' adaptive capacities and promote sustainable thinking. Embedding practical lessons on water conservation, waste reduction, resource management, and sustainable business practices within existing subjects will foster environmentally responsible behavior from an early age. Both ministries should also invest in teacher and faculty development programs that equip educators with the knowledge and tools to deliver interactive, locally relevant environmental and sustainability content. Strengthening these competencies will help cultivate a generation of students prepared to engage in green entrepreneurship and climate adaptation at both community and professional levels.

Climate-Resilient Livelihood and Green Economy

- The MoTA should develop a seasonal tourism map that identifies key destinations throughout the year based on climatic suitability, regional strengths, and community capacities. This will help distribute tourism activity more evenly across seasons, optimizing resource use and sustaining income for local communities year-round. Also, the Ministry should promote community-based tourism platforms and initiatives that were recently developed, highlighting their environmental and social value. In parallel, MoTA should showcase green tourism initiatives under its programs to attract visitors, stimulate local economies, and encourage sustainable practices across the tourism sector.

- The Ministry of Agriculture (MoA) should enhance green coverage and afforestation in public and tourism areas to improve shading, reduce heat exposure, and mitigate local temperature rise. Integrating such efforts within national reforestation and urban greening programs would strengthen both climate resilience and environmental quality.

- MoEnv should establish awareness and technical support programs to guide individuals and entrepreneurs in developing green business proposals, accessing relevant classifications, and connecting with financing opportunities. In addition, MoEnv should lead efforts to develop a national framework for monitoring job losses linked to climate change, ensuring evidence-based policymaking and labor market adaptation strategies.

Innovation and Private Sector Engagement

- MoEnv, in partnership with JRF and other national stakeholders and partners should establish a National Innovation Hub for Climate Resilience and Livelihoods to serve as a collaborative platform to support innovative, community-driven solutions addressing climate and socio-economic challenges. Unlike traditional incubators, the hub should prioritize inclusion of vulnerable households and underserved populations, providing them with access to technical support, mentorship, and small sub-grants to pilot adaptive livelihood ideas. Also, youth engagement should be central to the model, fostering innovation through local competitions, digital tools, and green entrepreneurship initiatives that contribute to sustainable and equitable adaptation pathways.

- The MoEnv and the Ministry of Investment should jointly design and implement a pilot green investment project that demonstrates measurable financial and environmental returns, serving as a national model for replication. In parallel, the Ministry of Investment should develop legal and financial incentives, such as tax exemptions or preferential treatment, to encourage the private sector to invest in green and sustainable projects.

Health and Safety:

- The MoH, in cooperation with the Civil Defense Department and the Ministry of Labor (MoL), should implement community-based health awareness and first aid campaigns focused on heat stress, dehydration, and other climate-induced health risks. Additionally, occupational safety protocols should be strengthened for workers in sectors exposed to extreme weather conditions.

Social Protection and Child Well-Being:

- The MoSD and the National Aid Fund (NAF) should strengthen social protection networks to reduce child labor in areas most affected by drought and climate change. In addition, expanding coverage of cash assistance and livelihood support programs would help vulnerable families maintain income stability and prevent negative coping mechanisms such as child labor, early marriage, or school dropout.

- The National Council for Family Affairs (NCFA) should establish a sub-national coordination committee on climate change and child protection to institutionalize cross-sectoral collaboration on emerging climate-related risks to children. The committee should include representatives from key ministries (such as the MoEnv, MoSD, and MoE), alongside national and international organizations engaged in child protection and climate resilience to review and translate research findings into policy actions, design joint interventions that integrate protection within climate adaptation frameworks, and promote continued research and data sharing on the intersection between climate change and child well-being in Jordan.

- MoSD should establish and co-led a Joint Committee on Climate Vulnerability and Social Protection, with JRF, with participation from the NCFA, the National Aid Fund (NAF), and the MoEnv, with the aim to build on JRF's climate change research as an evidence base to deepen understanding of the climate-economy-protection nexus at the household level. It should also coordinate with the PRISM initiative to integrate climate hazard assessments into national social protection frameworks. Additionally, the committee would facilitate data sharing, policy dialogue, and the design of integrated interventions addressing how climate risks exacerbate household vulnerability and child protection concerns to ensure that future adaptation and protection programs are climate-informed and socially inclusive.

Research, Governance, and Policy Integration:

- The MoHESR in collaboration with the MoEnv, JRF, and key Jordanian universities should establish a national research consortium to strengthen academic engagement in applied research on the links between climate change, livelihoods, and social protection at the household level. It would promote interdisciplinary studies, student research grants, and policy-focused collaborations that translate academic findings into practical solutions. The findings should also be a bridge between academia, policymakers, and practitioners to support evidence-based climate adaptation and integrate research outputs into national and local development strategies.

To Donor Agencies and Financing Bodies

Financing and Long-Term Commitment:

- Donors and financing institutions should allocate predictable, multi-year funding for social protection and climate adaptation programs. Sustained financial commitments would enable partners to implement integrated, development-driven resilience approaches, providing stability for vulnerable communities and supporting national adaptation objectives.

Climate-Resilient Infrastructure and Green Livelihoods:

- Donor agencies and development banks should expand investments in climate-resilient community infrastructure and green livelihood opportunities, such as water management systems, renewable energy, and climate-smart agriculture. They should also support innovation, advocacy, and entrepreneurship programs that promote green jobs, especially for youth and women, thereby contributing to inclusive economic growth and Jordan's green transition agenda.

Inclusive and Sustainable Green Market Systems:

- Donors should promote the development of inclusive and sustainable green market systems, focusing on strengthening local supply chains, facilitating access to finance for MSMEs and green entrepreneurs, and encouraging environmentally friendly production models. This should be complemented by co-creation with government, civil society, and private sector partners to design programs that generate employment, reduce environmental degradation, and foster long-term community ownership.

Evidence-Based and Protection-Focused Programming:

- Donor agencies should prioritize protection-focused and resilience-oriented programs that address the intersection between climate change and household vulnerability. Aligning future interventions with the findings of this study will enhance evidence-based design, targeting, and coordination, ensuring that supported projects effectively reduce climate-related risks and strengthen community-level resilience.

To Implementing NGOs and CSOs

Awareness, Education, and Behavior Change:

- NGOs and CBOs should conduct integrated awareness campaigns in climate-affected areas addressing child labor, early marriage, and broader climate-related risks. These campaigns should emphasize adaptation behaviors, preparedness, and family resilience, using community engagement, local media, and youth initiatives. Special focus should be placed on linking climate change education with protection and well-being concepts, encouraging collective community responsibility.

- NGOs and CSOs should expand non-formal education and awareness programs that strengthen communities' understanding of climate change, resilience, and environmental responsibility. Through workshops, youth initiatives, and community campaigns, NGOs can help translate complex environmental concepts into practical actions such as efficient water use, waste management, and sustainable local practices.

Livelihoods and Economic Empowerment:

- NGOs should strengthen economic empowerment and livelihood programs for vulnerable families, prioritizing sustainable income generation, micro-enterprise development, and savings schemes. Women, in particular, should receive legal literacy and empowerment training to enhance their participation in economic life and their ability to adapt to climate-induced socioeconomic changes.

- NGOs and CBOs should strengthen local green value chains and community enterprises by promoting environmentally sustainable production and consumption practices. Through training, technical support, and local partnerships, they can help small producers and entrepreneurs improve product quality, adopt eco-friendly technologies, and reach wider markets

Institutional Capacity and Green Transition:

- NGOs and CSOs should invest in building the institutional capacity of CBOs to address protection and climate-related challenges effectively through tailored training, mentoring, and coordination frameworks. In partnership with academic institutions, NGOs should also conduct awareness sessions and campaigns for university educators and youth groups on green economy and sustainability concepts, promoting future career paths and entrepreneurship opportunities aligned with the green transition.

Protection and Case Management Systems:

- Implementing NGOs and CSOs should strengthen and maintain clear, regularly updated referral pathways and case management procedures and mechanisms to ensure timely and coordinated responses for individuals and families affected by climate and protection risks. This includes improving response mechanisms for child labor, early marriage, and GBV, in collaboration with community and religious leaders. In addition, partners should continue to support the national helpline 110 through covering operational and other running costs to ensure its continued functionality, in addition to staff training on psychosocial support and first-line interventions to enhance service quality and coverage.

- Implementing partners should deliver mental health awareness and psychosocial support programs targeting both women and men in climate-impacted communities. Activities should address stress, anxiety, and other climate-related pressures while promoting community-based coping mechanisms and access to safe, confidential psychosocial services.

To Media and Communication

Protection, Social Services, and Communication:

- Media institutions should design and implement awareness campaigns on the social and economic impacts of climate change, with a focus on its link to protection, livelihoods, and household resilience. Campaigns should highlight practical adaptation measures, promote positive behavioral change, and amplify the voices of affected communities.

Awareness, Education, and Behavioral Change:

- Media institutions should collaborate with experts, NGOs, and government bodies to ensure that messages are evidence-based and accessible to diverse audiences, including women, youth, and people in rural areas. Using storytelling, community reporting, and locally relevant content will help build public understanding and encourage collective action toward climate resilience.

References

No.	References
1	Abu Sada, A., Abu-Allaban, M., and Al-Malabeh, A. (2015) Temporal and spatial analysis of climate change at Northern Jordanian Badia. JJEES, 7(2), pp.87-93. Available via: https://jjees.hu.edu.jo/files/Vol7N2/JJEES_Vol7N2_P87-P93.pdf
2	Al Naber, M., Alhaddadin, R., and Fakhoury, S. (2023) Gender, climate and cohesion - Uncovering the linkages between climate change, human security and gender in Jordan. WANA Institute, Amman. Available via: https://bit.ly/3XcQhu0
3	AWC and UN Women (2023) Gender, Climate Change, and Migration in Jordan and Sudan. Arab Water Council and UN Women. Available via: https://bit.ly/4dUzth3
4	Bjerkestrabd, S. (2023) Jordan's Bedouins take on the struggles of climate change. Al Jazeera. Available via: https://bit.ly/3MfPQZQ
5	Chambers, R., & Conway, G. (1991) Sustainable Rural Livelihoods: Practical Concepts for the 21st Century. Institute of Development Studies. Available via: https://www.ids.ac.uk/download.php?file=files/Dp296.pdf
6	Climate Watch (2021) Jordan. Climate Watch World Resources Institute. Available via: https://www.climatewatchdata.org/countries/JOR?end_year=2021&start_year=1990
7	DoS (n.d) Poverty Statistics. Available via: https://dosweb.dos.gov.jo/population/poverty/
8	DoS (2010) Report of Poverty Status in Jordan. Available via: https://dosweb.dos.gov.jo/DataBank/Analytical_Reports/Economic/Poverty_Report/Jordan_Poverty_Jordan_en_2008.pdf
9	El-Sharif. S., Muasher, M. (2024) Vulnerability and Governance in the Context of Climate Change in Jordan. Carnegie Endownment for International Peace. Available via: https://bit.ly/4deuGH2
10	FAO (2020) Building Resilience to Cope with the Climate Change in Jordan through Improving Water Use Efficiency in the Agriculture Sector (BRCCJ). FAO. Available via: https://bit.ly/3Me4wbS
11	Global Center on Adaptation (n.d) What is Climate Adaptation? Available via: https://gca.org/what-is-climate-adaptation/
12	Haddad, R. (2023) The Threat of Climate Change in Jordan. Carnegie Endownment for International Peace. Available via: https://carnegieendowment.org/sada/2023/04/the-threat-of-climate-change-in-jordan?lang=en
13	Halaseh, R. (2024) Assessing Climate Vulnerabilities in Amman City. Carnegie Endownment for International Peace. Available via: https://carnegieendowment.org/research/2024/05/amman-jordan-climate-vulnerability-adaptation?lang=en&center=middle-east
14	ILO (n.d[1]) What is a Green Job? Available via: https://www.ilo.org/topics-and-sectors/just-transition-towards-environmentally-sustainable-economies-and-societies/what-green-job
15	ILO (n.d[2]) KILM3. Status in Employment. Available via: https://share.google/cO3p29jMNiBcSp500
16	Jaskolski, T., Pongelli, F., Ibrahim, N., and Isied, D. (2022) Climate Change and Social Vulnerability. WFP. Available via: https://gis.jor.wfp.org/portal/sharing/rest/content/items/0fc68957a0d24e0b89ddf45c1cd53098/data
17	MoEnv (2021[A]). Updated Submission of Jordan's 1st Nationally Determined Contribution (NDC). UNFCCC. Available via: https://unfccc.int/sites/default/files/NDC/2022-06/UPDATED%20SUBMISSION%20OF%20JORDANS.pdf
18	MoEnv (2021[B]) Tourism Sector: Green Growth National Action Plan 2021-2025. Amman. Available via: https://www.moenv.gov.jo/ebv4.0/root_storage/ar/eb_list_page/20022_jordan_tourism_v02_rc_web-0.pdf
19	MoEnv (2022) Fourth National Communication on Climate Change: Hashemite Kingdom of Jordan. Amman. Available via: https://bit.ly/3SZI2yX
20	MoTA (2022) Environmental and Social Assessment (SEA) for the Jordan Tourism Strategy (2021 – 2025). Available via: https://www.mota.gov.jo/ebv4.0/root_storage/ar/eb_list_page/final_sea.pdf

21	MWI (2022) Jordan Water Sector: Facts and Figures. Amman. Available via: https://mwi.gov.jo/ebv4.0/root_storage/ar/eb_list_page/jordan_water_sector_-_facts_and_figures_2022.pdf
22	ND-GAIN (2023) ND-GAIN Country Index. Available via: https://gain.nd.edu/our-work/country-index/rankings/
23	OHCHR (2016) Inputs for OHCHR's Analytical Study on the Impacts of Climate Change on the Enjoyment of the Rights to Health (Human Rights Council Resolution 29/15). Available via: https://www.ohchr.org/sites/default/files/Documents/Issues/ClimateChange/Impact/Jordan.pdf
24	Perera, T. (2023) Water and climate stress are threatening Jordanian refugee hosting communities. What are we doing about it?. IWNI. Available via: https://www.iwmi.cgiar.org/news/water-and-climate-stress-are-threatening-jordanian-refugee-hosting-communities-what-are-we-doing-about-it/
25	Perosino, L. (2023) Agriculture in Jordan at the time of climate change: Identifying causalities between imperialism and environmental degradation. Noria Research. Available via: https://noria-research.com/agriculture-in-jordan-at-the-time-of-climate-change-identifying-causalities-between-imperialism-and-environmental-degradation/
26	Salameh, E. and Abdallat, G. (2020) The Impacts of Climate Change on the Availability of Surface Water Resources in Jordan. Journal of Geoscience and Environment Protection, 8, 52-72. doi: 10.4236/gep.2020.810004. Available via: https://www.scirp.org/pdf/gep_2020101415070984.pdf
27	WFP (2023) Climate Change and Social Vulnerability. WFP. Available via: https://www.undp.org/sites/g/files/zskgke326/files/2023-04/Full_Report.pdf
28	WHO (n.d) Gender and Health. Available via: https://www.who.int/health-topics/gender/strengthening-health-sector-response-to-gender-based-violence-in-humanitarian-emergencies#tab=tab_1
29	UNDP (2022) Youth for Climate Action: Engaging Jordanian Youth in Climate-Related Policymaking. UNDP. Available via: https://jordan.un.org/sites/default/files/2022-12/YOUTH%20FOR%20CLIMATE%20ACTION%20policy%20brief.pdf
30	UNDP (2023) National Disaster Risk Reduction Strategy 2023-2030. Amman. Available via: https://bit.ly/4duFl0H
31	UNFPA (2022) Climate Change and Gender-Based Violence in Jordan. UNFPA, Amman. Available via: https://bit.ly/3WSywyM
32	UNFPA (n.d) What is Gender-Based Violence (GBV)? Available via: https://www.usaforunfpa.org/what-is-gender-based-violence-gbv/
33	United Nations Framework Convention on Climate Change (UNFCCC) (1992). United Nations Framework Convention on Climate Change. Available via: https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
34	United Nations Industrial Development Organization (n.d) Green Industry Initiative. Available via: https://www.unido.org/our-focus/cross-cutting-services/green-industry/green-industry-initiative
35	World Bank (2018) The role of food and agriculture for job creation and poverty reduction in Jordan and Lebanon. Agricultural Sector Note (P166455). https://documents1.worldbank.org/curated/ ar/325551536597194695/pdf/Agricultural-Sector-Note-Jordan-and-Lebanon.pdf (Mo
36	World Bank (2023) Atlas of Sustainable Development Goals 2023. Available via: https://datatopics.worldbank.org/sdgatlas/goal-1-no-poverty?lang=en

Appendix 1: RRGs Members

RRG	RRG Member	Entity
External RRG	Sarah Haleeq, Head of the Adaptation Department at the Climate Change Directorate	Ministry of Environment (MoEnv)
	Hanin Abu Hamra, Deputy of Director of Green Economy Unit	Ministry of Environment (MoEnv)
	Jawad Dukhgan, National Project Coordinator	International Labour Organization (ILO)
	Eng. Maen Ayasrah, Director of the Center of Energy and Environmental Sustainability in the Industry (CEESI)	Jordan Chamber of Industry (JCI)
	Suzan Kasht, Child Protection Specialist	UNICEF
	Dr. Fadwa Dababneh, Assistant Professor, Department of Industrial Engineering	German Jordanian University (GJU)
	Jiyeoun Bae, Climate Change Finance Officer	United Nations High Commissioner for Refugees (UNHCR)
	Hakam Matalqah, Head of the Family Affairs Unit	National Council for Family Affairs (NCFA)
	Maisam Otoum, Jordan Country Director	Cewas Middle East
	Yazeed Assad, Project Officer	Trip to Innovation (TTI)
Internal RRG	Reem Abbasi, PD Senior Manager	JRF
	Ola Maria, Institutional Development Senior Manager	
	Walaa Ayasrah, Program Quality and Research Senior Manager	
	Yara Musleh, Projects Manager	
	Nizar Slebi, Projects Manager	
	Shatha Habahbeh, CSP Prevention Activities Manager	
	Laila Juma, Programs Reporting and Communication Specialist	
	Abdullah Muhsen, Projects Budgeting Manager	
	Tala Malakha, Projects Manager	
	Shorouq Hamdan, Project Manager	

Appendix 2: Interviewed Experts

No.	Date	Entity	Interviewed Experts
1	25 March 2025	Oxfam	Raya Taher, Program Manager (Climate and Economic Justice)
2	25 March 2025	Embassy of Netherlands	Ahmad Hijazi, Policy Officer on Climate Action
3	26 March 2025	FAO	Maysoon Zoubi, Project Manager
4	27 March 2025	ILO	Jawad Dukhgan, National Project Coordinator
5	27 March 2025	Iksab Center for Sustainable Development	Eng. Mazen Abu Qamar, General Manager
6	08 April 2025	World Bank	Majdi Salameh, Environment Specialist
7	09 April 2025	NARC	Dr. Maram Al Naimat, Climate Change and Drought Researcher
8	14 April 2025	GGGI	Jooyoung Yoo, Senior Officer, Monitoring, Evaluation and Learning (MEL)
9	17 April 2025	FCDO – IWMI	• Sawsan Gharaibeh, Regional Researcher - Gender and Social Inclusion • Jeremy Stone, Researcher - Jahez Project Leader • Mitchell McTough, Postdoctoral Fellow – Water, Conflict & Resilience • Stephen Fragaszy, Researcher - Al Murunah Project Leader
10	21 April 2025	AVTR	Eng. Lubna Qaraleh, Head of Studies and Planning Unit
11	23 April 2025	UNICEF	Khamza Abdurakhimov, Programme Specialist, Climate and Environment
12	23 April 2025	JEDCO	Eng. Eman Atieh, Value Chain Manager
13	23 April 2025	AWO	Maen Aldhoun, Outreach Coordinator
14	24 April 2025	NCFA	Hakam Matalqah, Head of the Family Affairs Unit
15	28 April 2025	JNCW	Dr. Nisreen Al-Sayyed, Deputy Secretary-General
16	05 May 2025	WHO	Dr. Alaa Al-Shaikh, Public Health Officer
17	05.05.2025	MoSD	• Sireen Hakouz, Director of the Productivity Enhancement and Housing Directorate • Ola Arafat, Head of the Buildings Affairs Division – Directorate of Administrative Affairs
18	12.05.2025	NCSCM	• Zuhair Tamimi, Studies & Prediction Unit Director • Eng. Saleh Sheyab, Director of Operations and Plans • Dr. Ahmed Naimat, Media Response Unit Director
19	15.05.2025	IUCN	Dr. Ali Hayajneh, Programme Manager
20	20.05.2025	Family Protection & Juvenile Department	Mohammad Awaideh, Head of the Regional Training Center
21	22.05.2025	MoPIC	• Mutasim Al-Kilani, Head of the Sustainable Development Division • Dr. Hadram Al-Fayez, Studies Director
22	22.05.2025	Institute for Family Health	• Dr. Sarah Aitan, Head of the Medical Department • Bana Maani, Portfolio Manager