Bridging the Gender Gap: Mitigating the Impacts of Climate Change on Women in MENA with a Focus on the Agriculture Sector

NAOUM Rawia Fuad[1]

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ABSTRACT:

This study explores the disproportionate impact of climate change on women and girls in the MENA region's agricultural sector. This exploration includes women's key challenges regarding health, education, access to resources, and work environment. The research also seeks to identify strategies to bridge gender equality gaps that may amplify due to climate change, through synthesising and analysing scholarly articles and reports from governmental and non-governmental organisations (NGOs) working in the MENA region and worldwide. This research offers a comprehensive analysis of the gendered impacts of climate change on MENA agriculture, a topic that has received limited attention in MENA region. Moreover, it suggests improvements for existing strategies to improve women's situation in the agricultural sector and to increase resilience for women and their families in the face of climate change.

Keywords: Climate change, Gender equality, MENA region Agriculture sector , Women's challenges, Key Stakeholders, Adaptation strategies.

1. Introduction

The Middle East and North Africa (MENA) region is home to extensively varied natures and cultures; however, the MENA region is one of the world's most vulnerable and highly effected to the impacts of climate change. Climate change impacts the environment as well as other aspects such as economic, political, health, and social aspects (Nong, et al., 2020). Green (2020, p. 152) stated, "Climate change is not about science, but politics. It requires elaborating a new theory of the political economy that puts the climate crisis front and centre." Other scholars, such as Mearns & Norton (2010), stated that the social aspects of climate change must be

[1] NAOUM Rawia Fuad, (PhD Student) Faculty of Business and Economics (International PhD Programme in Business Administration), University of Pécs, e-mail: rawiahnaoum@gmail.com

elaborated on more and given a more thorough focus in the research field. According to Gupta (2015), Climate change risk is often perceived to impact women more severely than men, making them more vulnerable.

In the context of the MENA region, according to IMO (2024), women make up the majority of the agricultural workforce in the MENA region, with Jordan, Libya, and Syria having over 60% of their agricultural workforce comprised of females. Therefore, climate change's effect on the agriculture sector mainly is enormous, more specifically with the increasing of women's participation in the agricultural workforce in the MENA region, possibly due to men and male youth leaving the sector to chase other sources of income, migrants and refugees' movement, disasters and wars. As stated by Baruah & Najjar (2022, p.6) "Although all farmers had been negatively affected by the effects of climate change, women often experienced additional challenges due to gender norms and cultural practices".

This paper explores climate change's impact on women and girls in the MENA region, specifically on Health, Education, Access and control over resources, and work environment aspects. Moreover, it explores strategies implemented to bridge the gender inequality gaps in the MENA region.

Overview of Climate change crisis in the MENA region

The Middle East and North Africa (MENA) region is home to extensively varied cultures, a population of about 500 million (Kyungmee & Garcia, 2024), with approximately 40% of them children (UNICEF, 2022a), and geographical diversity that spans mountain varieties and river valleys to wide arid landscapes (Miller, et al., 2022). However, the MENA region is one of the world's most exposed and highly unprotected to the impacts of climate change (Kyungmee & Garcia, 2024; The World Bank, 2023a). Enduring ever-higher temperatures, rising seas, droughts, floods, intense water scarcity and polluted air (Kyungmee & Garcia, 2024), agricultural activities face challenges due to the scarcity of freshwater resources and limited arable land. Additionally, the increasing urban population leads to higher consumption of energy, water, and food (Miller, et al., 2022). Moreover, challenges are being imposed on energy systems already straining to meet economic growth demands, energy security and

social welfare (Lim, et al., 2023). Table (1) provides an overview of the most affected regions in the MENA countries.

Table 1: *Some of the countries in the MENA region are affected by climate change.*

Country	Main characteristics of the affected region
Jordan	- High temperatures cause high evaporation rates and droughts (Ministry of Environment, 2021), specifically in Jordan Valley (Haddad, 2023). - Globally, Jordan is ranked as the second most water-stressed country. (USAID, 2022 ; UNICEF, 2022a)
Lebanon	- Coastline cities: climate-related sea level rise and saltwater intrusion into coastal aquifers (Ministry of Foreign Affairs, 2018). - Water Scarcity: Despite Lebanon's relatively abundant natural water resources (The World Bank, 2024), over 70% of the Lebanese population currently faces critical water shortages (Ferrando, 2022). Lebanon has a notable water shortage as a cause of different factors, for example; population growth, quick urban development, extreme weather conditions, and the displacement of Syrian refugees to Lebanon . (The World Bank, 2024).
Syria	- Low and inconsistent rainfall during the winter season of 2021, coupled with increasing temperatures (IFRC, 2022), caused droughts in Northern and NorthEast Syria (The World Bank, 2022), in addition to significant losses in crop and livestock in other areas in Syria(IFRC, 2022).
Iraq	- The rate of desertification and temperature rise is seven times higher than the average global increase (Schaer, 2023), affecting 39% of Iraq's area. Iraq faces very high temperatures, which are causing drought. In addition, dust storms are becoming more intense (ICRC, 2022). - The rate of desertification and temperature rise is seven times higher than the average global increase (Schaer, 2023), affecting 39% of Iraq's area. Iraq faces very high temperatures, which are causing drought. In addition, dust storms are becoming more intense (ICRC, 2022).
West Bank / State of Palestine	- The West Bank is facing a severe water scarcity issue, with the Palestinian communities in Bethlehem and Hebron governorates being the most affected. (Oxfam and MA'AN development centre, 2021). This is due to the restrictions imposed in Area C, which limited Palestinian control over water resources (Oxfam and MA'AN development centre, 2021). In addition to the temperature increase (Al-Haq , 2019; Hallaq & Daas, 2024).

Yemen	- Yemen is currently experiencing a one of the worst in the world humanitarian crisis. As a result of long-lasting conflict, economic crises, and frequent climate hazards. These hazards include increasing temperatures, increasing sea levels, and inconsistency in rainfall patterns, which lead to floods, droughts, soil degradation, and reduced water sources . (SIPRI, 2023; Tamdeen Youth Foundation and Oxfam, 2022).
Egypt	- Egypt's Nile Delta and its coastal front on the Mediterranean: heatwaves, increased soil salinisation, rainfall retention, and desertification (Eelnahry & Doluschitz, 2009; The World Bank, 2021) - Egypt's agricultural lands are facing irrigation issues due to the tremendously low rainfall and high evaporation rates (Kotb et al., 2000).
Algeria	- Algeria is second in water scarcity of all countries in Africa (Mohammed & AlAmin, 2018), rainfall in Algeria has decreased by 40% in the west, 30% in the centre, and 20% in the east, in addition to temperature increasing (Bensmaine, 2022), where the highest warming is observed at the Southern stations (Bouregaa, 2022).
Morocco	- Morocco's vulnerability to climate change is highlighted by the more frequent occurrence of drought, particularly in the central and southern regions. (IEA, 2023; IMF, 2023).
Tunisia	- Water scarcity, coastal erosion, temperature increasing, and more frequent floods one of the most pressing climate change issues in Tunisia's (EIB, 2022) as low and variable rainfall (The World Bank, 2023b)

Source: *Own work*

Based on the above table, the paper investigates (i) water scarcity, (ii) rising sea level (SLR), and (iii) temperature heat trends.

1.1 Water Scarcity

The MENA region faces the most water and food scarcity (Abou Zaki et al., 2022) and, even more, is the most water-scarce region in the world (UNICEF, 2021). Of the 17 most water-stressed countries worldwide, 11 are in the MENA region: Bahrain, Iran, Jordan, Kuwait, Lebanon, Libya, Oman, Israel/The State of Palestine, Qatar, Saudi Arabia, and the United Arab Emirates (UNICEF, 2021). Approximately 70 per cent of the lands in these countries are considered as arid or semi-arid, receiving less than 250 millimetres of annual rainfall. The

remaining areas receive a moderated volume of rainfall ranging from 300 to 600 millimetres (Dogar & Sato, 2018). Moreover, as a result of the increase in population in the MENA region and the growth of economic activities, the current water supply is not enough. Where, It is expected that the annual water supply per person in the Middle East will decrease from 1000 to 600 cubic meters by 2025(Qin, et al., 2019) . With the pollution and salinity challenges, building dams and extracting groundwater, the water resources are becoming scarcer (Ouda, et al., 2021 With the exception of Iraq, Oman, Syria, and Lebanon, the MENA region countries have renewable water resources that are available at a rate of less than 1000 m3 per capita per year. In Kuwait, the availability of renewable water resources is as low as 50 m3 per capita. (Selvaraju, 2013; Sowers, et al., 2011).

1.2 Rising Level Sea (SLR)

Due to climate change, MENA countries are also predominantly vulnerable to sea level raising (SLR) (Borghesi & Ticci, 2019). The MENA region, which generally comprises more temperate and littoral countries (Chibani, 2022), has a high concentration of human population as well as agricultural, industrial, and other economic activities in the coastal zones (Waha, et al., 2017), A significant percentage of the population, approximately seven per cent, live in regions where the altitude is less than five meters above sea level. These areas are considered to be highly vulnerable to floods; they also affect the economic activities of the residents (Borghesi & Ticci, 2019). The effect of sea level rise may also be destructive to economic activities, such as tourism, agriculture and fishing, especially in the Mediterranean and Red Sea sub-regions (Borghesi & Ticci, 2019). Apart from the floods, the rise in sea levels is also anticipated to cause significant effects such as the infiltration of saltwater, salinity of groundwater increase, rising water table levels, and hindered soil drainage (Hunt & Watkiss, 2011; Werner & Simmons, 2009).

1.3 Temperature Heat Trends

A growing body of literature on the changes of temperature patterns predicts that global warming is expected to last until the end of this century (Collins et al., 2013; Feng et al., 2014; Raftery et al., 2017). With a focus on the MENA region, most MENA countries are facing recurrent extreme temperature waves above 35°C and severe drought in summer (Fragaszy, et al., 2020; Tanarhte, et al., 2015), these episodes of extreme temperatures expect to increase further (Bucchignani, et al., 2018; Coumou & Rahmstorf, 2012; Lelieveld, et al., 2016; Ozturk,

et al., 2018), leading to large dry regions that may increase the risk of scarcity and scarce-related mortality (Varela, et al., 2020). According to (Varela et al., 2020) study, several cities such as Accra (Ghana), Lome (Togo), Mogadishu (Somalia), and Riyadh (Saudi Arabia) will experience heatwave conditions for almost the entire warm season. This study also suggests that the mean intensity of heat waves will increase between 2°C and 4°C, depending on the location. The cities in the Middle East, Eastern Africa, and the Mediterranean area will be the most affected, while those in the Gulf of Guinea will be the least affected. Moreover, cities such as Alexandria, Giza, and Istanbul will experience maximum heat wave intensity exceeding the threshold value by more than 12°C (Varela et al., 2020).

2. The Gendered Impact of Climate Change in the MENA region

As mentioned previously, the Middle East and North Africa (MENA) region is highly vulnerable to the impacts of climate change and also ranks by (World Economic Forum, 2023) as one of the regions with the greatest gender inequality worldwide. For instance, according to the Global Gap Report by (World Economic Forum, 2023), the current parity score of the MENA region stands at 62.6%, indicating that it is the farthest away from achieving equality, suggesting that it would take approximately 152 years to attain full parity. According to IOM (2024), the agriculture sector in the MENA region is the largest in terms of employment for women, and it also offers significant job opportunities for refugees, especially for women in countries such as Lebanon, Iraq, Somalia, Sudan, and Yemen. (UNDP, 2021). As a result of existing gender disparities in the region, women face disproportionate risks from climate change (Moneer, 2024). For instance, there are 48.7 million adolescent girls across the MENA region in drought-impacted communities (UNICEF, 2022b). The impact of climate change can be seen in different dimensions: Health, Education, Access and control over resources and Work environment.

Health: The impact of heatwaves, drought and water scarcity on agriculture and livelihoods affects mostly women in MENA communities as the largest percentage of the workforce in the agriculture sector are female workforce (UNICEF, 2022b). One example can be drawn here from rural areas in Morocco where dreadful climatic conditions effect women's access to health services more specifically as Morocco face frequent floods in areas such as Figuig, Ten Drara, and Bou Arfa (Kamal & Malle, 2023). Another example is from Jordan, where Joran is one of the top five most water-stressed countries in the world (UNFPA, 2022); women face more health risks from sanitation issues, more specifically in the rural areas (Kamal & Malle, 2023).

These issues are increasing due to women's growing care responsibilities, as due to gender roles, women and girls are responsible for care activities. According to (Oxfam & Includovate, 2023) women in the MENA region spend up to ten time more than men on unpaid care activities, including caring of others health. When disasters happen, such as in Syria, Iraq, Sudan and Yemen, the care responsibilities increase for women. According to (UNODC, 2021), women face higher health risks and need for healthcare on the migration journey as they may be responsible for tasks like childcare or breastfeeding and higher exposure to sexual violence. This hinders their mobility to seek shelter or assistance and increases their face of health risks such as fatality and injuries (Oxfam & Includovate, 2023). Moreover, the scarcity of clean water also makes adolescent girls' menstrual and hygiene arrangements more problematic, which implies their sexual and reproductive health (SRH), affects their well-being and decreases their educational opportunities (UNICEF, 2022c). All of this can add to the negative ripple effects on women and girls' mental health (Kamal & Malle, 2023).

Education: Women in the MENA region already face high responsibilities for unpaid care and domestic responsibilities due to the social norms, but climate change increases these responsibilities on women, which leads to limits their opportunities for education and employment (Moneer, 2024). For instance, women in MENA regions, more specifically, rural and agricultural areas often are responsible for collecting water for their families and for their work in the agriculture sector, which is considered to be time-consuming and physically demanding (Grossman, 2023). According to (World Bank, 2009) the MENA region, women and girls spend up to six hours per day collecting water, this may lead to less participation in education, employment and economic activities. For example, in Yemen, due to droughts and aggravated water scarcity, some girls have to drop out of school to tackle the burden of their care and water responsibilities (CIVIC, 2022). Another aspect that leads to school absenteeism or dropouts is the lack of sanitation and hygiene services in educational institutes in MENA region more specifically in the rural region due to concerns surrounding security and hygiene (Oxfam & Includovate, 2023).

Access and Control over Resources: In the MENA region, the agriculture sector has a relatively high percentage of women participating in it compared to other sectors (World Economic Forum, 2023). Women in the region not only face significant barriers to accessing water due to limited infrastructure and resources (Grossman, 2023), but they may also lack

access to land management. For example, according to (ICARDA, 2020), women own less than 5 per cent of the agricultural land in the region, and they often do not have a say in decisions related to land management. Baruah & Najjar (2022, p.5) stated that "women's contribution to the sector remains largely undervalued, if not invisible". According to certain estimates by Kabeer, et al., (2019), around half of the women who work in agriculture are either not included in the national surveys or identified as economically inactive. Moreover, social Norms, discriminatory laws, and limited access to and control of financial services in the MENA region encumber women's access to resources such as credit, water, cash, and land, and this limits women's abilities to participate fully and considered to be seen in the agriculture sector economically and earn an income and limit their ability to contribute to food and water security (Grossman, 2023) and face the climate change challenges. Moreover, there is extensive evidence of gender inequity and wage bias in agricultural labour. Researchers such as Baruah & Najjar (2022); de Pryck & Termine (2014); Najjar et al., (2018) disclose that due to stereotypes that tend to underestimate women's work in the agriculture sector, women steadily perform tasks that require less skill and are typically compensated at a lower rate, with risky work environment, inconsistent and seasonal, while men perform more permanent, technologically advanced, and higher-paying jobs.

Gender-Based Violence and Sexual Harassment: Women in the MENA region, more specifically in the agriculture sector, may also face challenges related to Work Environment and Sexual Harassment (WSH) (Baruah & Najjar, 2022) . More specifically, women who are immigrants, younger, and refugees due to climate change crises (Moneer, 2024) or political crises or come from indigenous communities are particularly vulnerable to WSH (Reyes Rocha & Sexsmith, 2024). For instance, according to the United Nations High Commissioner for Refugees (UNHCR, 2020) , due to the extensive floods that occurred in Yemen in the summer of 2020, about 300,000 individuals lost their homes, crops, and livestock and were subsequently internally displaced. As stated by (Moneer, 2024) "In addition, the displacement process puts women and girls at high risk of gender-based violence, human trafficking, injury, and death". A study by ILO 2018 indicates that non-standard forms of work, including temporary work and informal work, are critical factors in creating such behaviours (Henry & Adams, 2018) . Factors contributing to this issue include power differentials between supervisors and workers, the cultural norm of silence and tolerating such behaviours, and structural environments that distance perpetrators from accountability; limited labour law coverage and application and poor

labour inspection services further increase agricultural workers' vulnerability to sexual harassment (Henry & Adams, 2018)

Discussion: Strategies to mitigate gender inequalities caused by climate change

Climate change has a snowball effect in all aspects, specifically in the social aspect. The effects of climate change tend to exacerbate the vulnerabilities associated with long-standing inequality patterns (Schipper et al., 2022). Rao et al. (2019, p.19) stated, "Migration emerges as an important adaptive strategy in the face of climate and other livelihood risks and uncertainties." Therefore, climate change signifies migration and displacement, where it is expected to displace over 250 million between 2007 and 2050, as stated by (Dimitrov, 2019). Therefore, decision-makers and critical actors must be aware of the importance of planning climate-resilient development solutions, as well as addressing the long-term impact of socio-economic inequities (Schipper, et al., 2022) . To address the risks of climate change and implement effective measures, the main actors need to be active and involved to work together and coordinate their efforts towards sustainable adaptation, which can lead to more sustainable results. Effective, sustainable adaptation entails the proper active participation of key stakeholders in order to identify the best and most appropriate adaptation methods and strategies (Leal Filho et al., 2018; Nicholson, 2018).

Stakeholders Engagement

According to (Lewis, 2004, p. 202) the term stakeholder refers to "any person or group that can claim an organisation's attention, resources or output or who may be affected by the organisation". Moreover, different individuals or groups have varying levels of power(Krüger, 1974), legitimacy (Suchman, 1995), and urgency (Mitchell, et al., 1997) make them the key stakeholders. According to (Conde et al., 2005, p.50), "The term "stakeholder" in climate change studies refers to policymakers, scientists, administrators, communities, and managers in the most at- risk economic sectors. In this context, stakeholders from both public and private enterprises can be brought together to develop a joint understanding of the issues and to create adaptations". Based on that, the stakeholders are two types: (i) people who have the power and control over resources and (ii) those whose lives are affected by the circumstances and the interventions (Mkonda, 2022).

Therefore, stakeholder engagement is very crucial to guarantee that there is no missing perspective from a certain group and has its influence on the outcomes. Stakeholders' engagement is defined by (Brown, et al., 2001) as is a set of actions that an individual, group, or organisation can take to effectively communicate with, involve, or seek feedback from their current stakeholders. In the climate change context, these stakeholders include, but are not limited to, the government, international organisations and development agencies, women farmers and producer groups, non-governmental organisations (NGOs) and civil society organisations (CSOs), and private sector and affected groups, including marginalised groups and women.

For instance, the government has a crucial role in addressing policies related to climate change (Marty, et al., 2023). However, previous studies have indicated that some gender and climate change policies have not adequately addressed structural issues, equality dynamics, and intersectionality (Krizsan & Lombardo, 2013). At the same time, other authors argue that the government lacks financial resources on the ground to solve these issues (Ampaire, et al., 2020). Therefore, to ensure gender equality in policies, it is essential to incorporate women's decision-making and voice. Moreover, Gender Equality and Social Inclusion (GESI) considerations must be integrated from the problem identification part into climate and agriculture strategies and create and enforce policies, programs, and regulations accordingly (Gumucio & Rueda, 2015; IUCN, 2011). Climate change issues are considered a public sector responsibility; however, adaptation costs are too high for governmental bodies, explicitly developing countries such as the Middle East and North Africa. The private sector should also be involved with the government in supporting their countries in designing and implementing sustainable climate change solutions. As stated by Pauw, et al., (2020, p.91) “The public sector should (1) provide a stable and attractive regulatory framework necessary to catalyse private investments in adaptation and (2) potentially intervene in areas that are not attractive for private investors. This includes investments with higher social benefits than private cash flows or where particularly vulnerable or marginalised communities need help”.

As stated, governments may face challenges securing funding and allocating technical research and implementation budgets. Therefore, here is the role of International Organisations and Development Agencies, where they can provide technical and financial support and facilitate partnerships and knowledge-sharing among various stakeholders. For example, the Green

Climate Fund (GCF) was established at the UNFCCCCOP15 conference in Copenhagen in 2009, a decision by 194 countries in order to support countries in planning and financing climate adaptation and mitigation. (Kalinowski, 2020), with the ultimate goal of contributing to the global effort to limit global warming and helping vulnerable communities cope with the adverse effects of climate change. GCF is providing support for governmental agencies in developing countries and embracing more board of involvement in the private sector (Kalinowski, 2020).

The private sector must also be considered for its role in sustainable climate change solutions; it could be through targeted investments and partnerships, supporting women-led enterprises, cooperatives, and agribusinesses in accessing finance, markets, and technology. However, the solution is not that simple, as stated by (Pauw, 2015, p.585)"the role of the private sector in development." Pauw's research (2015) distinguishes between two types of private sector engagement in development studies, as conceptualised by (Byiers & Rosengren, 2012). The first type, "private sector development," focuses on domestic economies in developing countries, where governments implement policies to stimulate economic transformation through investment, productivity growth, business expansion, and employment. The second type, "engaging the private sector for development," is further categorised into activities that promote productive investment and leverage private-sector finance to support development initiatives.

Nongovernmental organisations (NGOs) and civil society organisations (CSOs) have a crucial role in advocating for women's rights, building the capacity of the local communities, and assisting critical stakeholders in the local community, including the private sector and governmental, community groups and associations and individuals. The contribution of NGOs is highly recognised both nationally and internationally by policy-making institutions for grassroots-driven, people-centred, and participatory approaches where they are considered to act as intermediaries between communities, governments, and the private sector. Moreover, they are regarded for their capacity to fill the gaps that could not be filled by the states in terms of development effort and humanitarian responses (Banks & Hulme, 2012; Jahan Chowdhury, 2008).

The involvement of various local groups, such as farmers' groups, producers' groups, community networks, credit groups, and village councils, is crucial for effective adaptation to

climate change (Goulden, et al., 2009). Gender scholars advise identifying active, vital stakeholders early in the decision-making process with a gender lens, such as representatives from women groups, gender advisors in governmental bodies, and gender advocacy organisations, to include the gender equality and social inclusion (GESI) lens in sustainable adaptation to climate change solutions (Gumucio & Rueda, 2015). Therefore, it is essential to ensure women's voices are heard and include active women's groups and community-based organisations in these coalitions (Mulema, et al., 2022) . These groups play a significant role in identifying community needs and promoting sustainable solutions to address the challenges posed by climate change.

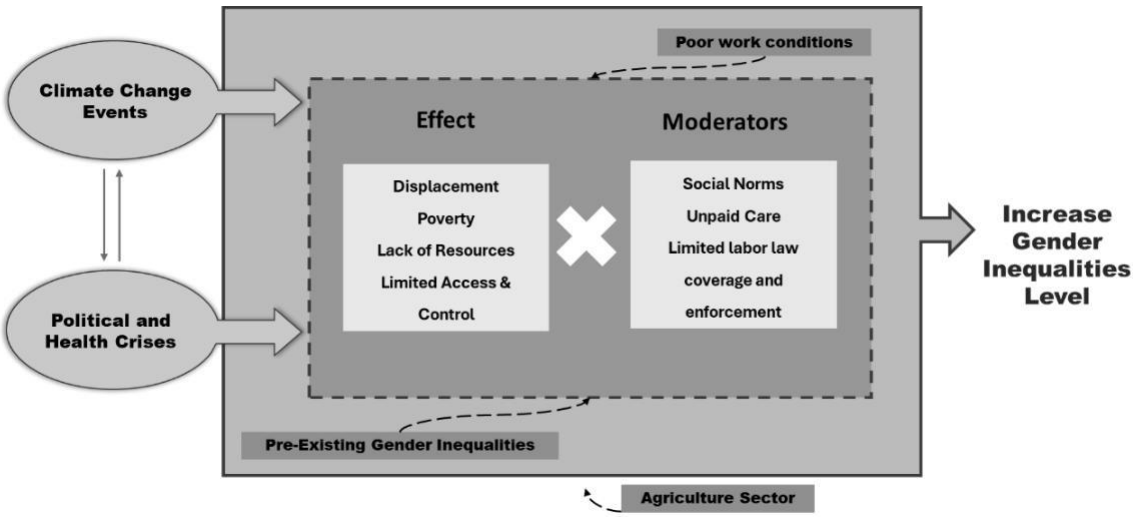
Research and academia institutions, such as higher education institutions, also significantly impact climate change mitigation and solutions and its impact on the gender dimension (Barth & Rieckmann, 2016; Giesenbauer & Müller-Christ, 2020) . These are considered partners in bringing evidence-based solutions and measuring the impact of the existing solutions. As stated by (Rolleston, et al., 2023; p.1), “Higher education institutions and research institutions have a major role to play in furthering climate justice through a range of channels, including research, teaching and curricula development, teacher education, community engagement and raising public awareness, as well as addressing the impacts of their operations and activities.” However, these institutions could have more of a role in engaging and interacting with the public sphere and other non-academic audiences, which has little attention in the literature (McCowan, 2020). Academic spheres need to broaden their focus beyond students and publications. They should aim to raise awareness through various platforms, not only to inform other experts and policymakers but also to create awareness among the community, which involves interacting with the public and other non-academic audiences outside their traditional domain (Gardner & Wordley, 2019; Gardner, et al., 2021; Green, 2020).

3. Conclusion

As stated by("World Meteorological Organization (WMO)," 2024), “Climate change is not ‘gender-neutral’, women and men are affected differently by weather and climate”, and as stated by (World Bank , 2023a) “women and girls are disproportionately affected by its impacts, as seen in the MENA region,” and therefore need gender-sensitive information and services to be designed and implemented for women and girls. Climate change's effect on the agriculture sector is mainly huge, more specifically with the increasing of women’s participation in the

agricultural workforce in the MENA region, possibly due to men and male youth leaving the sector to chase another source of incomes (Baada & Najjar, 2020). The trend of "feminisation of agriculture" has been reported in Algeria, Jordan, Syria, Libya, Palestine, Morrocco and Egypt (Abdelali Martini, 2011). This effect is increasing with the gender inequalities practices in the MENA region and, more specifically, in the MENA region. The concerns related to gender and its impact on climate change and adaptation have not been adequately tackled (Terry, 2009).

Figure 1: *Impacts of Climate Change on Women in MENA with a focus on the Agriculture Sector*



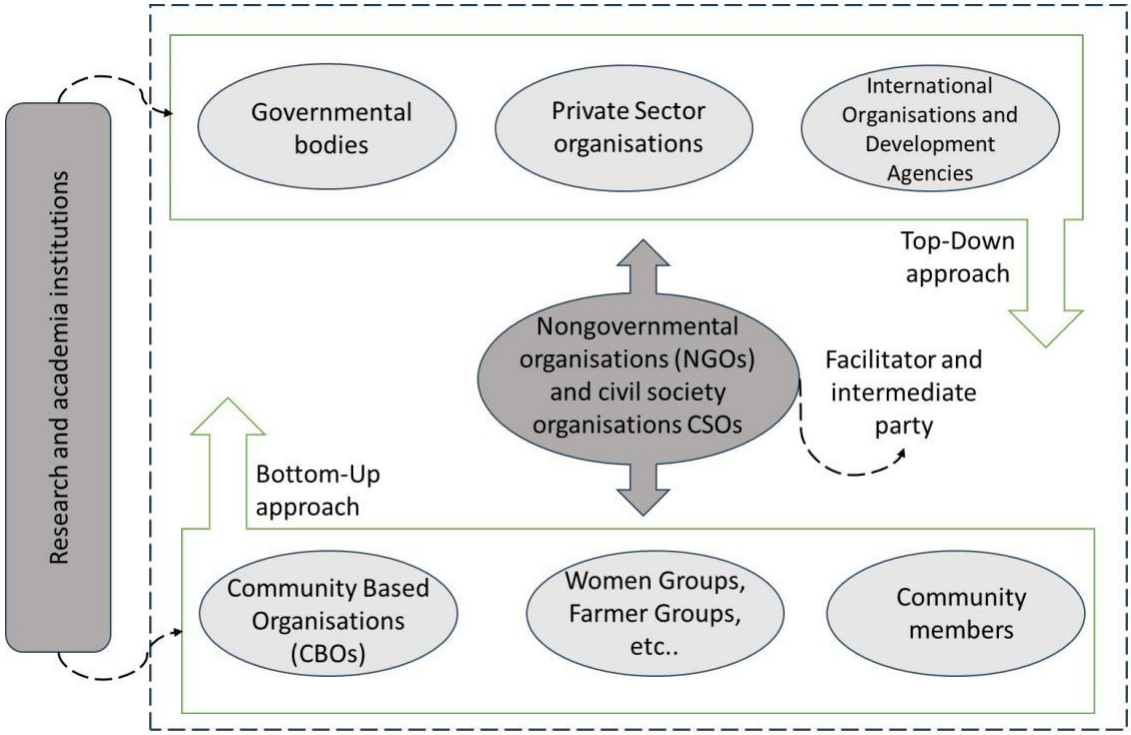
Source: Own illustration

This paper proposes a domino effect triggered by climate change events, as shown in Figure (1), that impacts developing countries such as countries in the MENA region and, more specifically, the agriculture sector. These events can lead to health problems such as anaemia and viral and bacterial illnesses. Similarly, political crises and conflicts like wars can cause issues such as pollution, further exacerbating climate change. This creates a cycle where climate change, political crises, and health issues are interconnected. The consequences of this cycle can be displacement, poverty, and limited access to resources. Existing gender inequalities, social norms, weak laws, and poor living conditions can worsen these effects. This situation has the potential to increase gender inequality within marginalised agricultural communities significantly.

Climate change adaptation strategies may fall short if there is no collaboration among key actors, making the solutions ineffective and unsustainable. Each stakeholder is responsible for mitigating and responding to climate change events and offering solutions to increase the number of climate change events on women and increase gender inequalities in the region (Brown, et al., 2001). To summarise stakeholders' engagement, different stakeholders must work together using both proactive and reactive measures to break the cycle of negative impacts from climate change. As the figure (2) shows, their engagement falls into two main approaches: Top-down and Bottom-up.

Figure 2: *Stakeholder Engagement to Mitigate the Impacts of Climate Change on Women in MENA with a focus on the Agriculture Sector*

Source: Own illustration



- Top-down approaches involve governmental bodies, the private sector, international organisations, and development agencies. These entities can regulate agricultural strategies for better climate change adaptation, enforce policies promoting sustainability and gender equality, and reform economic activities within the sector to include women's voices and empower marginalised groups.

- Bottom-up approaches focus on NGOs, CSOs, community groups, and farmers' groups. These groups play a vital role by mediating communication between communities, private sectors, governments, and international agencies. They also build technical capacities within communities and among farmers, raising awareness about negative social norms, unpaid care burdens, and gender-based violence.

- Finally, academic and research institutions, including universities, play a significant role in informing all stakeholders. They achieve this by creating evidence-based decision-making through research and data analysis for decision-makers and raising public awareness about climate change and its impacts on women and marginalised groups.

This combined effort from various stakeholders, working together through Top-Down and Bottom-Up approaches, is crucial to break the cycle of negative impacts triggered by climate change, particularly on women, girls and marginalised groups within the agricultural sector.

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