

ERF

Policy Research Report

**Gender Equality,
Climate Change,
and Clean Energy
in the Middle East
and North Africa**

Nada Mustafa Ali
and Racha Ramadan

Table of Contents

Table of Contents	2
List of Figures and Tables	3
Summary	4
1. Introduction	5
2. Women, gender, and climate change: why should we care?	6
3. The transition to clean energy, gender equality, and climate change	7
4. Gender equality and the transition to clean energy: a quantitative analysis	10
5. Discussion and conclusion	19
References	19

List of Figures, Tables and Boxes

Tables

Table 1. The estimated odds ratio of the logit model of considering using clean energy in Egypt	15
Table 2. The estimated odds ratio of the logit model of considering using clean energy in Jordan	16
Table 3. The estimated odds ratio of the logit model of considering using clean energy in Morocco	17
Table 4. The estimated odds ratio of the logit model of considering using clean energy in the three countries	18

Figures

Figure 1. Distribution of female-managed firms by sector	12
Figure 2. Age of top managers of firms considering using clean energy	12
Figure 3. Age of top managers of firms using clean energy	13
Figure 4. Education of top managers considering using clean energy	13
Figure 5. Education of top managers using clean energy	14
Figure 6. Reasons for investing in RE (prevalence of firms that (strongly) agree - %)	18

Boxes

Box 1: Selected Constraints to Women's Labor Force Participation in the MENA Region	8
Box 2: A Model of Good Practice: Using Technology to Break Gender Stereotypes	10

Summary

Background:

There is growing interest in climate change and clean energy in the Middle East and North Africa (MENA), a region that is highly affected by climate change but that is also endowed with abundant renewable energy (RE) sources. The literature on women, gender, and climate change in the region is limited but expanding. Existing studies and documentation of meetings and conferences on the topic show that women often play significant roles in attempts to address climate change and in attempts to transition to clean energy. Against this backdrop, this policy research report investigates the relationship between gender, climate change, and the transition to clean energy in the MENA region. It emphasizes the interdependence of concerns about the transition to clean energy on one hand and ensuring gender equality and social justice on the other.

Methods:

In addition to a review of academic literature, policy reports, and relevant video recordings, this report draws on quantitative analysis conducted using Economic Research Forum's (ERF) Renewable Energy Firm Surveys for three countries in the region: Egypt, Jordan, and Morocco.

Findings and policy recommendations:

The findings show that a firm's size, the age of the top manager, and sector of operation are all significant determinants of a firm's decision to transition to clean energy in these three countries. Moreover, a country's context matters. A firm operating in Jordan or Morocco, for example, has significantly higher odds of using clean energy compared to a firm operating in Egypt. While quantitative research in three MENA countries did not find a significant impact of gender diversification in MSMEs on transition to clean energy, the report highlights factors that contribute to women's underrepresentation in high-paying technical jobs in MSMEs, including dominant cultural norms, and their disproportionate role in carrying out unpaid work within the household. The role of women in the clean energy transition in the three countries requires further investigation. We also highlight the need to think about climate change in relation to broader questions in the region, such as gender equality, conflict and peace, democracy, and respect for human rights.

The authors wish to thank the Economic Research Forum for the opportunity to work collaboratively on this research, and the Development and the International Development Research Council (Canada) for generous financial support. Nada M. Ali would like to thank Frida Obare for valuable research assistance. The authors would like to thank the ERF team for excellent coordination. We also thank Dr. Bipasha Baruah and Dr. Atif Kubursi for insightful comments and feedback on earlier drafts of this research report. Any oversight is ours.

1. Introduction

In trying to explain both my work and my philosophy..., I [use the metaphor of] the traditional African stool, which is comprised of a seat and three legs. The first leg represents democratic space, where rights—human, women’s, children’s or environmental—are respected. The second leg symbolizes the sustainable and accountable management of natural resources both for those living today and for those in the future, in a manner that is just and fair, including for people on the margins of society. The third leg stands for what I term “cultures of peace.” These take the form of fairness, respect, compassion, forgiveness, recompense, and justice.

Just as the African stool is made [from a single block of wood...these] issues must be addressed together and simultaneously.

Wangari Maathai, The Challenge for Africa

Interest in climate change and clean energy is growing in the Middle East and North Africa (MENA), a region that is highly affected by climate change but that is also endowed with abundant renewable energy (RE) resources. The interest in clean energy is rooted in aspirations to address energy security, environmental concerns, and social and economic development.

There is also a continued interest in gender equality and women’s human rights. While there is progress in parts of the region in terms of women’s access to health and to primary education, the gender gap persists in several fields, including economic opportunities, clean energy and RE sectors. Taking women’s needs and gender equality into account when planning transitions to clean energy and in RE related efforts could improve the livelihoods of women involved in the sector and reduce time poverty for women.

This policy research report investigates the relationship between gender, climate change, and the transition to clean energy in the MENA region. It emphasizes the interdependence of concerns with the transition to clean energy on the one hand and ensuring gender equality and social justice on the other. We point to the need to think about climate change in relation to other broader questions in the region, such as conflict, democracy, and respect for human rights.

The report sheds light on drivers of the transition to clean energy in three countries in the MENA region from a gender perspective. The literature on women, gender, and climate change in the region is limited but expanding. Publications and documentation of meetings and conferences on the topic show that women often play significant roles in the region’s energy transition. Focusing on the intersection between gender equality

the transition to clean energy is important in its own right and not necessarily to ensure transition to clean energy. Moreover, there is a need for research that uses an intersectional perspective to examine the experiences and views of women and women’s organizations and movements working on climate change in the region, what these organizations have achieved, the challenges they face, and the strategies they use to address these challenges. Focusing on these areas is beyond the scope of this study, however.

The report is part of a broader Economic Research Forum (ERF) research project that aims to expand knowledge around transition to clean energy in six countries: Egypt, Jordan, Lebanon, Morocco, Tunisia, and Sudan. The broader research involves assessing the impact of the transition to clean energy on job creation, firm performance, inclusive and equitable growth, energy equity, and energy security. The project examines challenges that micro, small, and medium enterprises (MSMEs) face in the six countries. It highlights major drivers of an equitable energy transition. It also examines existing policy frameworks, stakeholder participation, and institutional and structural barriers to RE adoption. This report engages with some of these themes from a gender perspective.

In addition to a review of academic literature, policy reports, and relevant video recordings, this report draws primarily on a quantitative analysis conducted using the ERF Renewable Energy Firm Surveys for three countries in the region: Egypt, Jordan, and Morocco. Findings show that gender diversification in MSMEs management and ownership might not be a significant driver for transition to clean energy in the three countries of interest. The economic and institutional context of the country in addition to the size and the sector of the firms are key drivers for the clean energy transition. Understanding the roles women play in the transitions to clean energy in these three countries requires more investigation.

This report consists of an introduction and four sections. The first section discusses the intersection between gender equality, women’s activism, and climate change in the MENA region. The second section uses a gender and an intersectional lens to discuss transition to clean energy and gender equality in the region. The third section investigates the relationship between gender diversification in MSMEs and the transition to clean energy using a quantitative approach. Gender diversification is considered in the management, ownership, and employment of the surveyed MSMEs in the three countries in this study. The final section includes a discussion of findings, and conclusion.



2. Women, gender, and climate change: why should we care?

As is the case in other parts of the world, climate change, the lack of access to energy and other resources, and the process of transitioning to clean energy affect the diverse population of the MENA region in distinct ways, these may be based on gender, age, disability, social class, regional location, and displacement, among other factors. At the same time, there is a consensus that the integration of women's rights and gender equality into the mitigation of and adaptation to climate change (while not instrumenting women's rights and gender equality) would amplify the effectiveness of such interventions (Barre et al., 2018) and accelerate the transition to clean energy and RE.

Global climate discourse and policies acknowledge the distinctive impact of climate change on diverse populations. As far back as the early 1990s, the Rio Principles emerging from the United Nations Conference on Environment and Development emphasized the important roles of women, young people, older people, “the very poor,” persons with disabilities, and indigenous communities in efforts to address climate change. Principles 20-22, for example, state that:

Women have a vital role in environmental management and development. Their full participation is therefore essential to achieve sustainable development.

The creativity, ideals, and courage of the youth of the world should be mobilized to forge a global partnership... to achieve sustainable development and ensure a better future for all.

Indigenous people and their communities and other local communities have a vital role in environmental management and development because of their knowledge and traditional practices. States should recognize and duly support their identity, culture and interests and enable their effective participation in the achievement of sustainable development.

The above principles have shaped policies and activism related to climate change at the local, regional, and global levels, including in the MENA region. Globally, both the Millennium Development Goals (MDGs) and the Sustainable Development Goals (SDGs), especially the latter, embody these principles and align with the struggles of women and feminist movements and scholars working to halt climate change and address its consequences. Women and feminist scholars and movements working on climate change often point to how gender inequality and other structural barriers compound the impact of environmental disasters

and other climate change-related factors on diverse women and girls and limit their abilities to address the consequences of climate change.

The MENA region is no exception. Feminist and women's organizations, scholars, and activists focusing on climate change in the region emphasize that structural inequality, discrimination against women and girls, the impact of conflict on women and girls, and the traditional division of roles between women and men within the household—including the responsibility find fuel for cooking in some countries, and care responsibilities—end up intensifying climate change impacts on women and limit their ability to face its consequences. Moreover, a lack of access to energy sources often contributes to women's time poverty. In parts of the region, women and girls may spend up to 18 hours per week collecting fuel for cooking. This, in turn, limits the access of women and girls to education, employment, and overall economic opportunities. During disasters, women are not always able to evacuate, for example. They are also often excluded or are less prepared to engage meaningfully in recovery efforts. Reasons include women's limited access to economic resources compared to men in their social groups, and women's unequal decision-making power at the family, community, and governance levels (cf. Sepúlveda, 2024).

Other distinct effects of climate change on women and girls emerge in the areas of agriculture, food security, water resources, biodiversity, and health. Women are often involved in subsistence agriculture, at times due to limited access to land, credit, and other resources. A decline in agricultural production due to environmental degradation arising from the extraction of resources such as mining, for example, impacts women's access to food and their ability to produce and make food for their families and communities—these are important care responsibilities that women perform that are often undervalued.

Studies have also documented the negative impact of environmental degradation on women's health, especially women's reproductive health. Most of the 3.2 million individuals who die prematurely from household air pollution are women and children (UNDP, 2023). Using wood, charcoal, and other unprocessed biofuels for cooking increases the likelihood of respiratory health diseases by 80 percent compared to the use of clean energy. Processed biofuels (such as liquid biofuels and biogas) are cleaner energy sources.

Addressing these barriers entails working at different levels to transform power relations and ensure gender



equality while also addressing the challenges arising from climate change. The clean energy sector is one arena that helps us better understand the intersection between gender and climate change.

3. The transition to clean energy, gender equality, and climate change

The transition to clean energy and RE is key to lowering emissions and addressing climate change. RE, including solar energy, wind energy, geothermal energy, hydropower, green hydrogen, ocean energy, and bioenergy are more cost-effective, especially in the long run. All renewables are cheaper when we factor in the cost of environmental harm, fossil fuel subsidies, and substantial investment over decades in the research and infrastructure development for fossil fuel extraction. Moreover, this sector generates three times more employment opportunities compared to the fossil fuels sector (United Nations, 2023), because fossil fuels are capital-intensive whereas renewables are labor-intensive.

There is heightened awareness about the environment and climate change in the MENA region, especially among youth, women, and high-income groups. Research in five countries, (Algeria, Egypt, Lebanon, Morocco, and Tunisia) reveals a positive correlation between gender (being a woman), age (being young), and income levels (having a high income) on the one hand and seeking a better environment on the other (Dibeh et al., 2021). Yet, girls and women are underrepresented in the energy sector and in the science, technology, engineering, and mathematics (STEM) fields, which are important for pursuing employment in both the fossil fuel- and RE-based sectors. While women represent 48 percent of the workforce in the region (World Bank, 2022), they represent only 22 percent of the workforce in the fossil fuels industry. At the global level, women represent 32 percent of the RE workforce. This share is even lower for senior positions, where only 14 percent are women (World Bank, 2022), depending on the sector. A closer look at the data, however, indicates that 32 percent is the average of STEM jobs, where women only hold 28 percent of the jobs. Women hold 35 percent of non-STEM tech jobs and 45 percent of administrative jobs. This shows that the biggest source of inequality is in STEM-related jobs, which require certain technical and engineering skills (IRENA, 2020: 19) and that tend to pay more.

Women are more likely to face barriers to starting their own businesses, especially in the energy sector (World Bank, 2022; IAE, 2023). These barriers often resemble barriers to entrepreneurship in other sectors, such

as limited access to assets, loans, and other funding. Moreover, energy sector entrepreneurship requires fairly high levels of skills, education, and technological know-how. Women often have lower access to all these compared to men from the same socioeconomic background.

As discussed above, and in the baseline review for the broader ERF research of which this policy research report falls under, the global representation of women in the RE sector stands at 32 percent. Across selected MENA countries, the representation of women in the RE sector varies from seven to nine percent (IRENA, 2022). In Jordan and Egypt, labor force surveys conducted in 2016 and 2019 respectively reveal that women's participation in the RE sector surpasses that of the overall energy sector by a mere one percent. In addition to Morocco, these two examples have emerged as regional centers for RE development in the past decade (Global Entrepreneurship Monitor, 2022). Statistics specific to the MENA region indicate that women's participation in both the fossil fuel and RE sectors is significantly lower than in other countries in the Global North and the Global South that are also trying to achieve gender equality in these sectors and others.

As mentioned above, the clean energy sector offers a range of employment opportunities for women, particularly in RE technologies such as solar, wind, and hydropower. MSMEs, including those led by women and youth, often contribute to the creation of jobs in low and middle-income countries (Belghiti-Mahut et al., 2016; Shanon et al., 2019; World Bank, 2022). This increases women's potential access to decent work, higher incomes, and professional development opportunities. Moreover, clean energy projects can contribute to better access for women to energy services, such as electricity and clean cooking fuels. This, in turn, can improve women's livelihoods, reduce women's time poverty, and, in certain cases, reduce their exposure to war-related or community-level gender-based and sexual violence.

It is important to think about the lack of access to employment in the RE and fossil fuel industries and the potential of these sectors to provide better job opportunities for women as part of the broader context of women's employment in the MENA region. The region currently has the lowest female labor force participation rate worldwide, at 19.9 percent (World Bank Indicators, 2024). Women in the region are also underrepresented in managerial and leadership positions. As such, some view the transition to clean energy in the region as "a social project to capitalize on the net socioeconomic and environmental benefits of a speedy, careful, and 'just' transition plan to renewable and green energy" (Abou Ali and Kubursi, 2024).



Box 1: Selected Constraints to Women's Labor Force Participation in the MENA Region

Dominant patriarchal norms and constructs of femininity and masculinity hinder female labor force participation, especially in higher-paying jobs. The unequal division of labor within households hinders women's ability to enter and remain in the labor market.

According to Mottagi et al. (2021), women in Egypt spend 9.5 hours more on unpaid household chores for every hour spent by men. Forty percent of women reported spending more time on household chores during the COVID-19 pandemic.

Women are underrepresented, especially in fields not considered suitable for women (e.g., STEM), which is not limited to MENA. Decision-making constraints exist. One-third of women state that their husbands would not allow them to work outside of the house, and none of the men agree with women working in a mixed-gender environment.

The lack of access to affordable childcare is another constraint. In Egypt, almost 96 percent of women in a pilot study express interest in childcare centers but cite concerns about high costs. Discriminatory laws also hinder women's labor force participation. According to the World Bank's Women, Business, and the Law 2024 Report, MENA and Sub-Saharan Africa have the lowest legal framework scores worldwide. Both regions also have the lowest implementation scores during the same period. The MENA region is introducing legal reforms, especially in labor laws and in introducing laws that criminalize sexual violence and harassment in the workplace. Three MENA countries (Jordan, Oman, and Qatar) introduced 10 legal reforms in 2023/2024 (World Bank, 2024: 7, 9-10).

Being part of a couple, especially with young children, is associated with lower participation rates for women and higher rates for men, especially in the MENA region.

Research on the impact of COVID-19 on women in the region by the International Labor Organization (ILO) (2020) and UN Women (Hanna et al., 2023) confirms that the unequal division of care and domestic responsibilities inside the home is a strong driver of inequalities in labor market participation.

In 2020, the pressures of juggling work and family, coupled with school closures and job losses in female-dominated sectors, meant that fewer women were participating in the workforce. Around 113 million women aged 25–54 with partners and small children were out of the workforce in 2020 (ILO and UN Women, 2022, n.p.).

About 13 million men in the same age group were out of the workforce—up from eight million before COVID-19 (ILO and UN Women, 2022). Women's lack of access to social protection compounds the problem.

Source:

Ali (2022) with additional information from Hanna et al., (2023).

Another area that warrants attention in terms of women's roles in the RE sector is education, especially in STEM fields. Globally, “the share of women among STEM graduates has been 35 percent for the past 10 years” (UNESCO, 2024: V). As discussed earlier, relatively low levels of education and limited training in STEM for women and girls also pose a hurdle to a greater role for women in the RE and fossil fuel industries. Dominant gender norms and negative stereotypes regarding education and employment for women limit women's access to STEM. A 2024 UNESCO report shows that “women struggle to pursue STEM careers, which manifests from an early age in the form of anxiety in mathematics and develops into a reluctance to study STEM subjects, ultimately resulting in the lack of women in the technology workforce” (UNESCO, 2024, V). The same is true in various countries in the MENA region. An engineer from Jordan, for example, states in a recorded presentation that being a woman limited her ability to find employment in her field. Another engineer from Sudan tells one of the authors that most women who were in her class in the early 2000s as undergraduate students have had to abandon the field due to a lack of access to opportunities and because of household and other social responsibilities. There is also anecdotal evidence of discriminatory workplace practices against women in STEM fields, including in clean energy, where women often face discrimination in hiring, promotion, and pay. There is a need for further research in this area as well as policies aimed at closing these gaps.

As with other settings, climate change policies and the transition to clean energy in the MENA region should be gender-responsive at the designing, planning, and implementation levels (United Nations Climate Change, 2022; UN Women, 2022). The lack of commitment to integrating a concern with gender, and/or the absence of deliberate action to remove barriers to women's involvement in the transition to clean energy may thus deepen gender inequality (cf. Barron et al., 2020; Sileem et al., 2020). As discussed above, there is a growing consensus that integrating women's rights and gender equality into the mitigation of and adaptation to climate change would amplify the effectiveness of such interventions (Barre et al., 2018) and accelerate the transition to clean energy and RE. A lack of attention to inequalities may undermine climate change adaptation strategies or any developmental efforts (Khattabi et al., 2014).

There are several critical interventions to address some of these challenges in the MENA region. One is the RENEW-MENA initiative, which aims to enhance women's economic participation in the energy sector, especially in clean energy transition jobs. The initiative



also seeks to improve workplace conditions in both the private and public sectors. Further, it aims to challenge dominant negative stereotypes regarding the role of women in the energy sector. The initiative seeks to improve the recruitment and retention of women in the sector and to promote women's entrepreneurship.

Another initiative is the Women in Clean Energy platform launched by the Clean Energy Business Council (CEBC). The initiative seeks to empower and support women in the energy sector in the MENA region to address the underrepresentation of women in this sector and to ensure that women participate in decision-making at all levels. Programs include networking, mentoring, and collaborations (Adejumo, 2023) in ensuring clean energy and gender equality.

Much of women's involvement in efforts to address climate change in the MENA region is at civil society and grassroots levels, or in cooperation with governments and international development agencies. Women members of civil society organizations devoted to addressing climate change and women's organizations that seek to change gender relations have been active campaigners for climate justice since the early 1990s. For example, women activists from the region participated in and informed the agenda of the Earth Summit (the United Nations Conference on Environment and Development) held in Rio de Janeiro, Brazil, in 1992, especially in relation to the role of women and regarding the intersection between climate change and women's reproductive health.

Women have also been active across the region at the grassroots level in addressing some of the challenges that their communities face through cleaning and managing waste. An example is the work of the Society of Garbage Collectors in Egypt who contributed to shaping feminist discourse on climate change since the 1990s, including at the United Nations fourth conference on women. Another example is the cooperatives of women street vendors in Khartoum, Sudan, which launched initiatives to clean Khartoum during Sudan's transitional period following the 2018/19 uprising. When sexual violence against women collecting wood for cooking increased in Darfur, Sudan, after the war erupted in 2003/04, community initiatives to provide solar cookers flourished in the area. After the eruption of the war in 2023, women in the Algejira state in Sudan led efforts to offer alternative sources of energy for cooking.

Strategies that may help address the challenges rooted in gender inequality in the clean energy sector in the MENA region include, but are not limited to, the following:

- Committing and taking action to safeguard gender equality and women's human rights at the de facto and de jure levels.
- Promoting gender equality in education and employment by ensuring that women and girls continue to pursue STEM education. This includes providing equal access to STEM training and mentorship programs; challenging negative and restrictive sex-role stereotypes in school curricula and beyond; supporting women's employment in STEM sectors; and rendering these sectors more sensitive to women's care responsibilities.
- Supporting women's entrepreneurship by providing women with access to finance, training, and networks to support their clean energy businesses. Women should have access to finance without the standard requirements of collateral (land, houses, or capital), which women have less access to.
- Implementing gender-sensitive policies by ensuring that clean energy policies and programs are designed to be inclusive and that workplaces are free from discrimination.
- Raising awareness about gender equality by educating the public and decision-makers about the importance and merits of gender equality in the clean energy sector.
- Monitoring systemic biases in technology and artificial intelligence (AI), and ensuring "media and information literacy, to enable users of AI tools to think critically and deconstruct stereotypes" (UNESCO, 2024: VIII).
- Using an intersectional approach.
- Recognizing that war and displacement; famine, droughts, floods, and other disasters connected to climate change often exacerbate challenges that communities affected by marginalization, war, and displacement face. This is evident in how floods in Eastern Sudan in 2024 affected populations displaced by war, for example.
- Ensuring a strong role and support for independent women's movements/women's organizations committed to addressing inequalities and injustice, including in the areas of climate change and the transitions to clean energy.
- Learning from community-level resilience and resourcefulness.
- Learning from good practice models elsewhere, especially in other Global South settings.



Box 2: A Model of Good Practice: Using Technology to Break Gender Stereotypes

With digital strengths galore, Nukta Africa Ltd. focused on changing the next generation's approach to gender roles in cooking, in [various] ways. They created a website, called 'Jiko Point,' where they publish a range of blogs to promote cooking through clean energy, and now have a focus on promoting women that sell clean cooking equipment. One of their assumptions was that by providing a website where people could post articles (in their case about clean cooking and cuisine) anonymously without disclosing their gender, they would encourage more writers. However, they saw that ... offering the option not to reveal ... gender had little effect on the number of writers.

Female developers have [created] the prototype of 'Jiko Sokoni,' an application where women sellers of clean energy items were invited to sell their products. Through conversations with organizations who work closely with female clean energy sellers, such as Forum CC and Dorucs, Nukta found a group of ten testers for the app.

Another component of [this] project has been the production of the cooking show 'Mwanaume Jikoni,' 'Men's Kitchen.' These episodes show and celebrate men cooking traditional meals, whilst talking about their cooking and eating habits. To date they have produced 10 episodes, all viewable on their show on YouTube. The series covers traditional and international dishes, as the men also discuss the role of gender and clean energy in cooking.

Producing 10 episodes was no small feat, as Nukta had to overcome resistance by men to be filmed. Quite often this was because they didn't want to be filmed cooking because of societal pressure, or be filmed in their kitchen as they didn't want others to see it. In order to get more men to open to being filmed, Nukta set up their own studio, so they had a neutral place to film.

On both their YouTube channel and website, men account for [most] of their audience, with 66 and 54 percent of the overall readership being made of young men respectively. By targeting the tech savvy generation of people between 18 and 30, it is certainly influencing others through providing positive male role models.

This project is continuing through a scaling-up phase, to consolidate learnings from phase one. They will start by showcasing female clean cooking entrepreneurs on their website. This should lead to increased awareness of the products and the sellers, which is likely to boost sales, thanks to a growing audience. Alongside this they will produce a series of video tutorials to share on their YouTube channel, to support female sellers develop their business and marketing plans

Source: *Energia.com*

4. Gender equality and the transition to clean energy: a quantitative analysis

This section investigates the relationship between ensuring the equitable involvement of both women and men in MSME management, ownership, and employment on the one hand, and the transition to clean energy on the other hand. In other words, the quantitative analysis here aims to test the hypothesis that gender diversification in MSMEs and women entrepreneurs might be key drivers in the transition to clean energy. This quantitative analysis is conducted using the ERF Renewable Energy Firm Surveys for three countries in the region: Egypt, Jordan, and Morocco. The surveys cover 1,002 firms in Egypt, 1,000 in Jordan, and 1,007 in Morocco. Firm sizes vary between fewer than five workers to 99 workers.

The use of clean energy differs among the three countries. In Egypt, almost none of the firms use clean energy. In Jordan and Morocco, only five percent and four percent of the firms, respectively, use clean energy. In the case of Egypt, 21 percent of the firms are considering shifting to clean energy, while the rate is 37 percent for both Jordan and Morocco. The decision to consider using clean energy might be associated with the familiarity with the term "clean energy." In Egypt, 93 percent of the firms considering the use of clean energy state that they are familiar with the term. This share is 67 percent in Jordan and 74 percent in Morocco.

Understanding the profiles of firms using clean energy and those planning to invest in RE has policy implications for the energy transition in the region. As discussed in the literature, gender equality and gender diversification in the board and management of the firms are key drivers of improved firm performance and contribute to women's economic empowerment (Johnson et al., 2020; Dibeh et al., 2021; Baseline Survey on Gender, 2024; Kubursi et al., 2024). Female participation in the decision-making process and firm ownership might accelerate the transition to clean energy, which is a proposition this policy research report aims to verify.

In all three countries, less than 50 percent of the firms have female top managers and those are concentrated in specific fields, confirming what was discussed above regarding sex-role stereotypes in education and employment. In Egypt, 32 percent of firms have female top managers, mainly concentrated in the retail sector, followed by the industrial sector (mainly garments and textiles). It is worth noting that sectors such as construction, wood products, and furniture are male-dominated, with no female top managers. In Jordan, only 11 percent of the firms are managed by females. Among these firms, 62



percent are concentrated in the health and education sectors. In the case of Morocco, 17 percent of the firms have a female top manager, and more than 10 percent of these firms are in the retail, wholesale, information and communication technology (ICT), education, or health sectors (Figure 1). For female ownership, the survey shows that in Egypt, Jordan, and Morocco, 61 percent, 83 percent, and 60 percent of firms have no female ownership at all, respectively. These findings show that more work is required to increase female participation in firms' management and ownership in the three countries to achieve gender parity.

Among firms with female top managers, 15 percent in Egypt, 33 percent in Jordan, and 35 percent in Morocco are considering using clean energy. Only four percent and two percent of these female-managed firms already use clean energy in Jordan and Morocco, respectively. These percentages are higher among firms with male top managers.

The survey includes a question regarding the plan to invest in RE. The results show that 51 percent, 63 percent, and 65 percent of the firms replied 'yes' in Egypt, Jordan, and Morocco, respectively. Among these firms, in Egypt, 29 percent have female top managers and 25 percent have more than 50 percent female ownership. These rates are 10 percent for Jordan. In Morocco, 18 percent of the firms who plan to invest in RE have female top managers and 21 percent have more than 50 percent female ownership.

The firms planning to invest in RE technologies are concentrated in the retail sector in Egypt and Jordan. In Morocco, these firms are concentrated in more sectors, such as the industrial,¹ retail and wholesale, financial activities, education, and health sectors.

Individual characteristics, such as the age and education of the top manager, might affect firms' decision-making process. Figure 2 shows the distribution of top managers considering using clean energy by age group. They are mainly concentrated in the age group between 30 and 49 years old (Figure 2). A similar finding is noted for those using clean energy. The level of education of top managers also determines the firm's commitment to the transition to clean energy. Survey findings indicate that firms considering the transition to clean energy have managers with technical degrees, university degrees, or higher (Figure 4). The same applies to firms using clean energy in Jordan and Morocco (Figure 5).

¹ The industrial sector includes text and garment, industry of food, industry of mechanics and electronics, industry of leather and chemicals and wood products.

To better understand the drivers of the transition to clean energy, we estimate a logit model² where the dependent variable answers the following question: "Have you personally considered using clean energies?" The variable takes the value of one if the answer is yes and zero otherwise. The main explanatory variable is the gender of the top manager. The aim is to investigate whether being a female top manager influences a manager's decision regarding the transition to clean energy. Other explanatory variables include the age and education of the top manager and the geographical location of the firm. The firm characteristics that might affect the decision to consider using clean energy are included in the model. These characteristics include firm size, having a tax registration, share of electricity bill in the total operational cost, and the sector in which the firm operates. The categories included for the different variables may vary between countries based on the number of observations.

The estimated odds (probability) ratios of the logit models are presented in Tables 1-3. Contrary to the literature discussed above, the results show that having a female top manager has no significant effect on the likelihood of considering using clean energy in all three countries. Age is a key determinant of the energy transition. In Egypt and Jordan, young managers aged 18-29 and those aged 30-59 are less likely to consider using clean energy compared to older age groups. This might be explained by the experience required in this sector. However, the age of the top manager has no significant effect on the decision in Morocco.

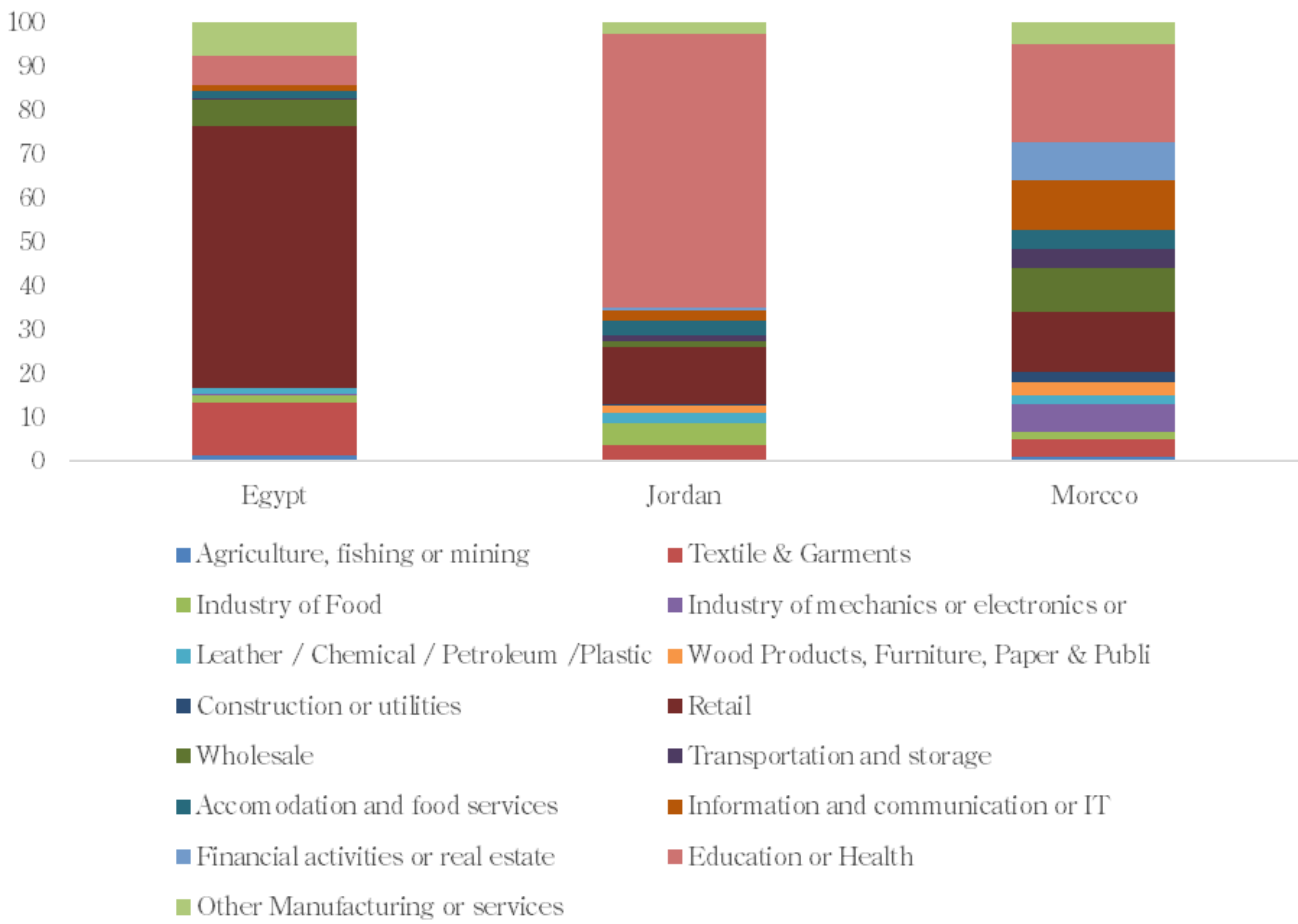
Interaction variables between the gender of the manager and other characteristics such as age, education, and formality of the firms are included in the model as well. The results show that female youth and adult top managers aged 18-59 have higher odds of considering the use of clean energy compared to those over the age of 60. This result is significant for Morocco³ and in line with the findings of

² The logit model is a commonly used regression technique when the dependent variable is a binary variable, such as the decision of considering clean energy studied here. The advantages of this technique include measuring associations between the independent variables (categorical and continuous) and the dependent binary variable. It allows us to predict outcomes and control for confounding variable effects. However, a logistic regression assumes linearity in the logit for continuous variables, which might be considered a limitation in case of non-linearity between the predicted variables and the predictor. Additionally, a logistic regression requires an adequate number of observations per independent variable for the binary outcome, an assumption that might not be easily verified in case of small samples (for more details about the logistic regression, check Stoltzfus, J. (2011). *Logistic Regression: A Brief Primer*. Academic Emergency Medicine; 18:1099–1104 2011 by the Society for Academic Emergency Medicine).

³ This variable was not included for the Egypt model as there were not enough observations.

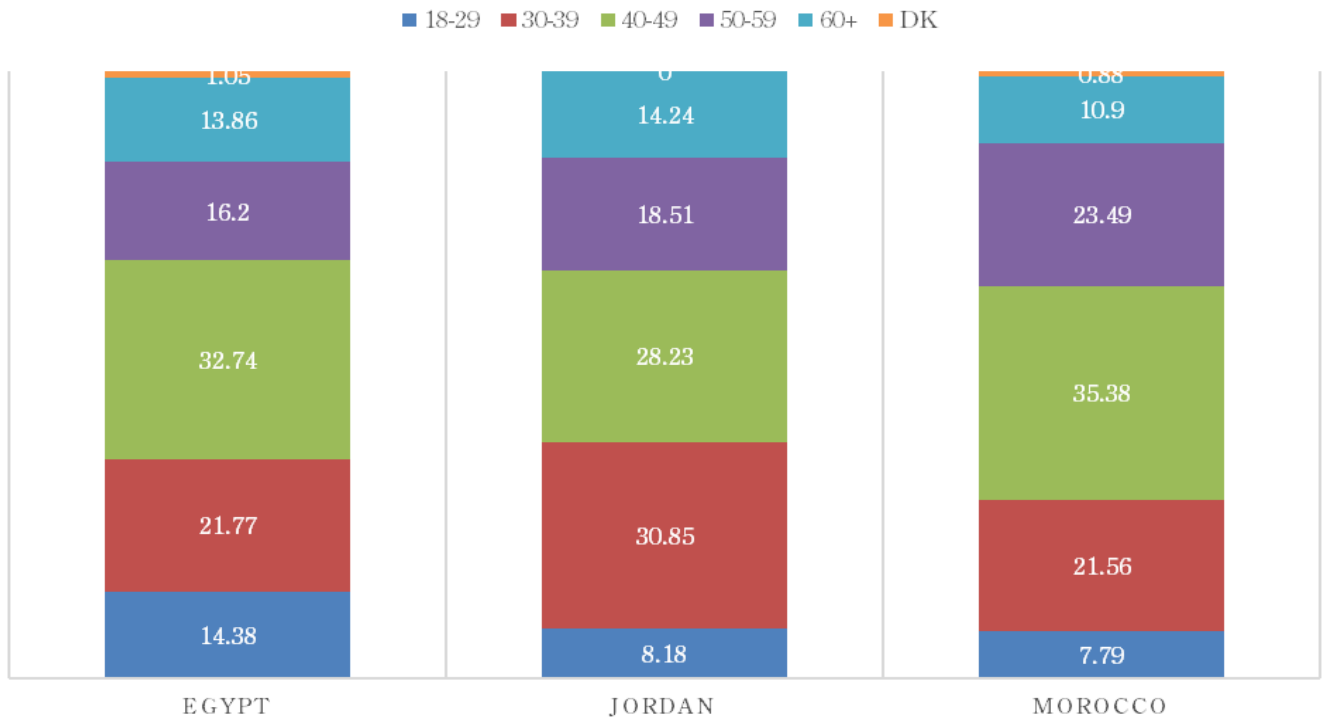


Figure 1. Distribution of female-managed firms by sector



Source: ERF Renewable Energy Firm Surveys for Egypt, Jordan, and Morocco.

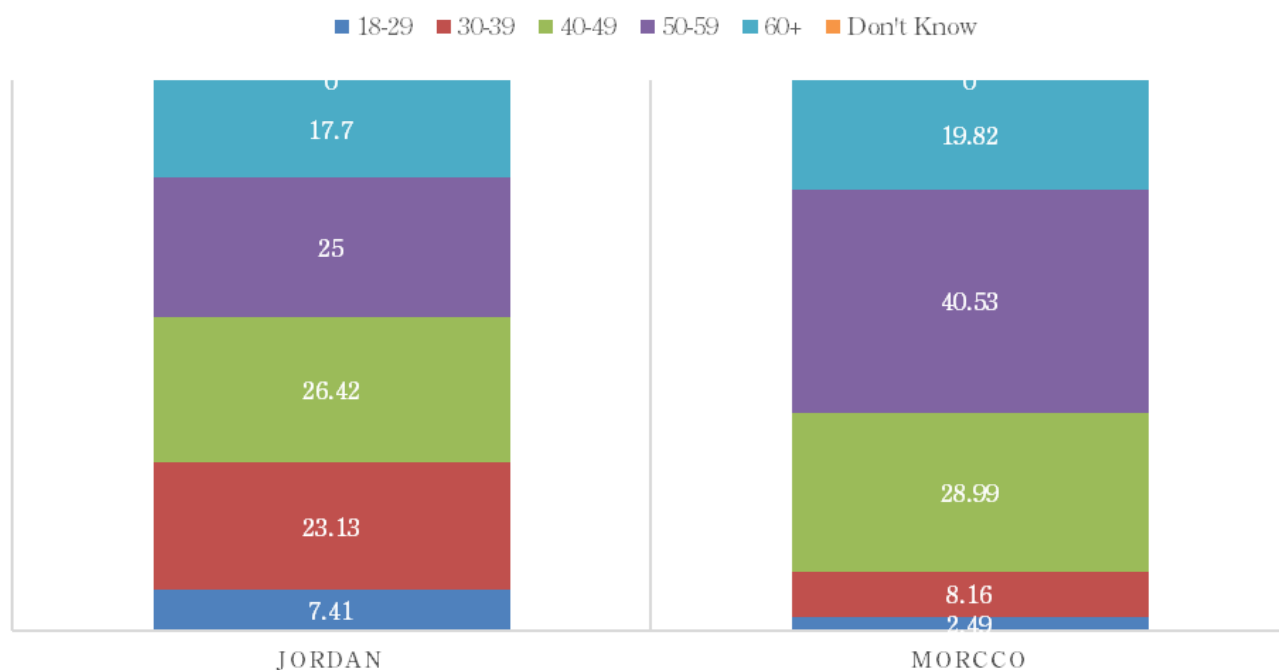
Figure 2. Age of top managers of firms considering using clean energy



Source: ERF Renewable Energy Firm Surveys for Egypt, Jordan, and Morocco.

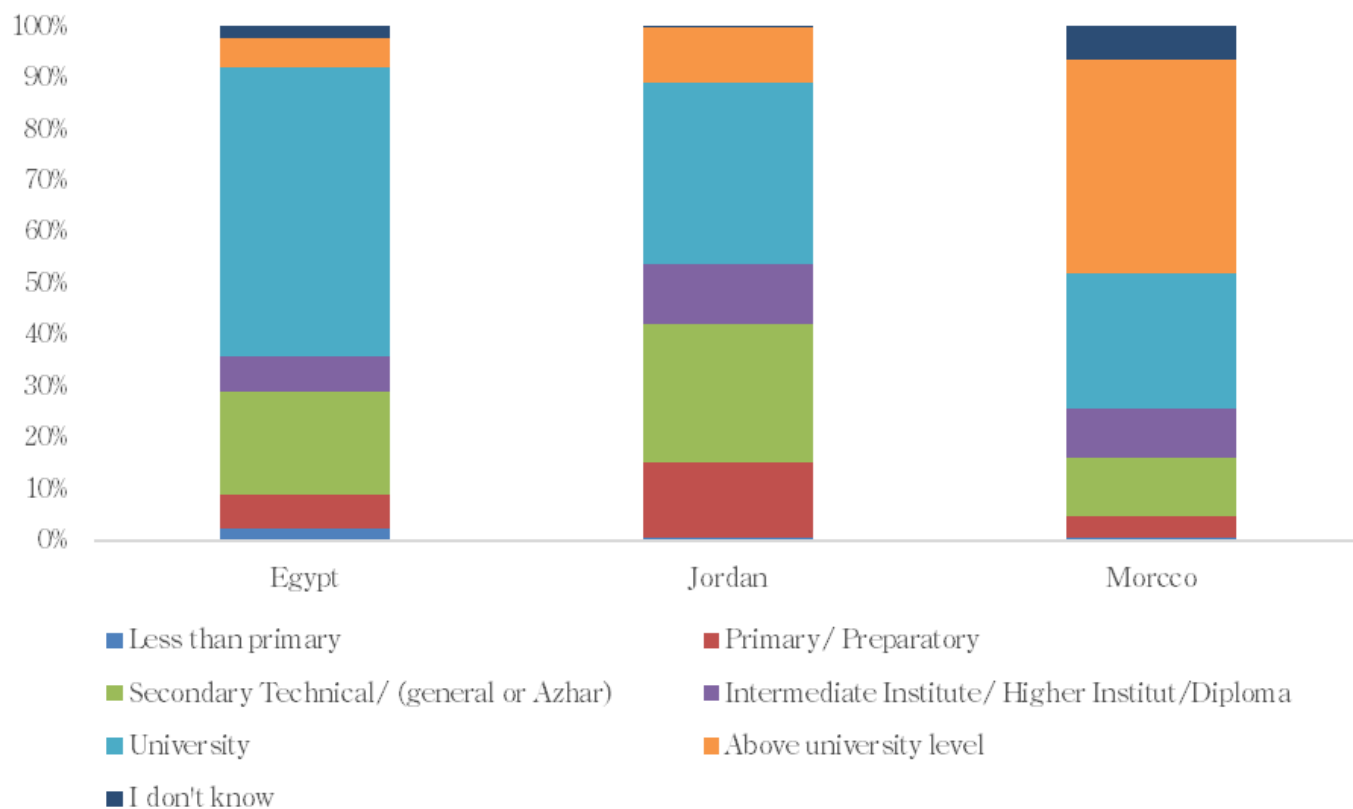


Figure 3. Age of top managers of firms using clean energy



Source: ERF Renewable Energy Firm Surveys for Egypt, Jordan, and Morocco.

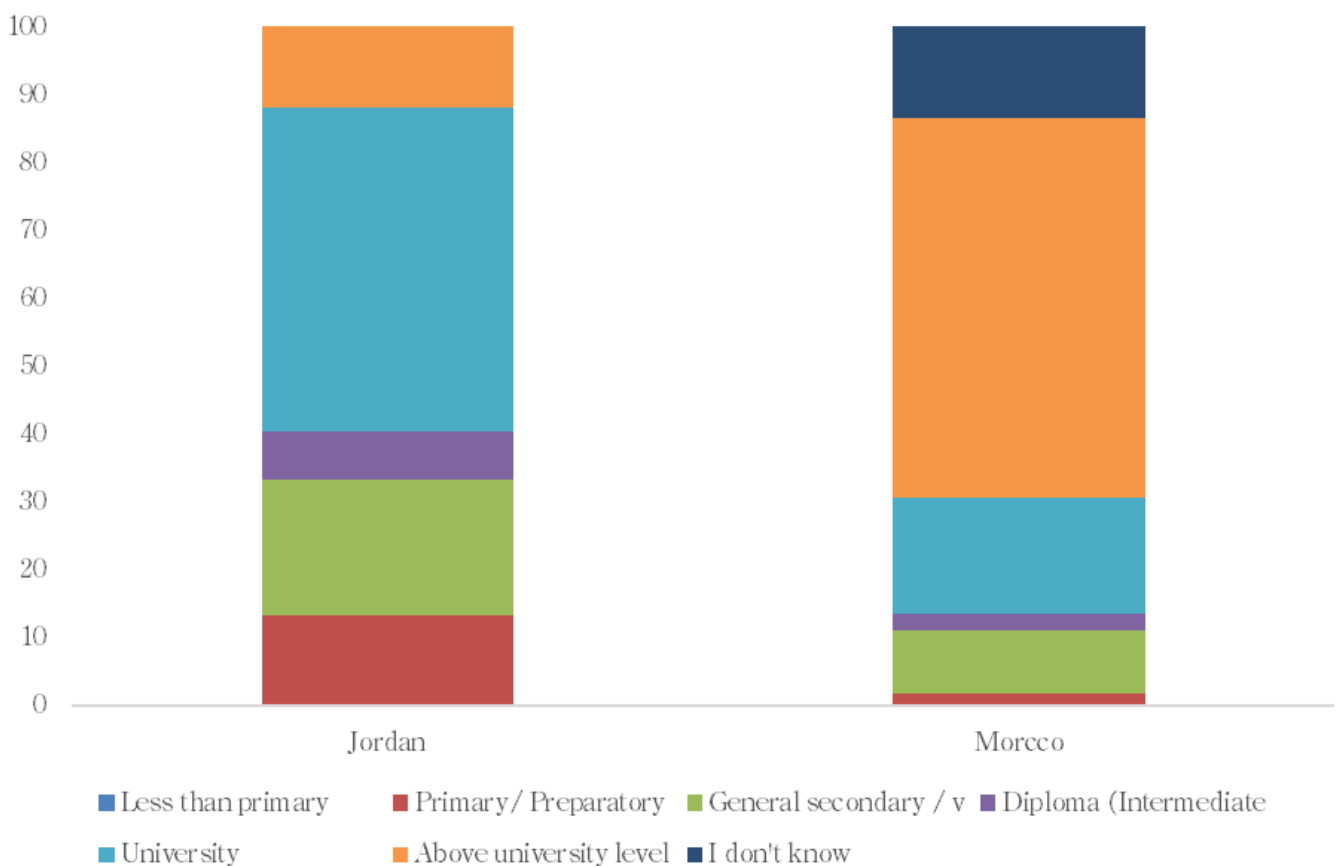
Figure 4. Education of top managers considering using clean energy



Source: ERF Renewable Energy Firm Surveys for Egypt, Jordan, and Morocco.



Figure 5. Education of top managers using clean energy



Source: ERF Renewable Energy Firm Surveys for Egypt, Jordan, and Morocco.

Dibeh et al. (2021). There is a positive correlation between being a woman and being young and environmental awareness. In Egypt, the female top managers of formally registered firms are less likely to consider using clean energy. A surprising result that requires more investigation is the negative effect of being a female manager with a diploma or university degree on the likelihood of considering using clean energy. A potential explanation is the field of study. Having a university degree in non-STEM fields might hinder the decision to use clean energy. This is a question to be investigated further with more data regarding the field of study. For the education level in general (not by gender), only top managers with a diploma in Morocco have significantly higher odds of considering the transition to clean energy compared to managers with primary education or lower levels.

Other significant determinants of the transition to clean energy include firm characteristics, mainly the size of the firm and the sector of operation. Being a small firm with six to 19 workers increases the odds of considering the use of clean energy compared to micro firms in Egypt

and Jordan. Additionally, medium firms with more than 20 workers are more likely to consider using clean energy in Morocco and Jordan compared to micro firms. This might be expected as bigger firms can invest in the technology required to transition to clean energy. In Egypt, firms operating in the ICT sector are more likely to consider using clean energy compared to firms in the agricultural sector. In Jordan, operating in the financial sector significantly decreases the odds of the energy transition compared to the agricultural sector. For Morocco, the sector of activity is not a significant determinant of the decision to consider using clean energy. An interesting finding is that the share of electricity bills in the total operational costs has no significant effect on the decision to consider using clean energy. This means that the decision is driven by other factors than the objective to reduce operational costs.

Another version of the model was estimated using all the firms from the three countries with dummy country variables to capture the effect of being in a given country. The results are presented in Table 4. Contrary to what was found in the country models, the results of this model including all three countries show that having a female



Table 1. The estimated odds ratio of the logit model of considering using clean energy in Egypt

	OR	Robust Std. Errors
Female Top Manager	0.455	0.476
Age of Top Manager (Ref: +60)		
18-29	0.397***	0.1289
30-59	0.561**	0.149
Education of Top Manager (Ref: primary or less)		
Secondary Education	1.196	0.398
Intermediate/Diploma	1.107	0.465
University Degree and Above	1.599	0.478
Firm has Tax Registration	0.991	0.240
Firm Size (Ref: Less than 5 workers)		
6-19 Workers	1.726***	0.338
20-99 Workers	1.244	0.386
Sector of Activity (Ref: Agriculture)		
Industrial	1.224	0.780
Services	1.026	0.654
ICT	4.427*	3.530
Financial	1.879	1.521
Education	0.811	0.582
Others	1.313	0.894
Construction	1.907	1.480
Share of Electricity Bill in Total Operational Cost	1.001	0.172
Firm in Urban Areas	0.698	0.196
Female Top Manager with Secondary Education	2.411	2.652
Female Top Manager with Intermediate/Diploma Education	1.432	1.733
Female Top Manager with University Education	3.307	3.444
Female Top Manager in Formally Registered Firm	0.402**	0.157
Constant	0.373	0.248

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

top manager significantly decreases the odds ratio of considering using clean energy. Similarly for young and adult managers, they are less likely to consider using clean energy, compared to elderly managers. As found in the country models, small and medium firms have higher odds of considering using clean energy compared to micro firms. For the country effect, the finding shows that firms in Jordan and Morocco are more likely to consider using clean energy, compared to Egypt. This explains the statistics above that only 51 percent of firms in Egypt plan to invest in RE compared to 63 percent and 65 percent in Jordan and Morocco, respectively. This interesting finding shows that the macro and institutional context of the country might play a crucial role in the transition to clean energy. As previously mentioned,

this result requires more investigation of the policies and incentives regarding the energy transition implemented in the different countries.

For the sensitivity analysis,⁴ two other models were estimated for each country. The first one uses the variable reflecting having female ownership and the second uses the number of the full-time employed females in the firm. These variables are used instead of the gender of the manager. For all three countries, none of the variables have a significant effect on the probability of using clean energy.

⁴ The results are available upon request.



Table 2. The estimated odds ratio of the logit model of considering using clean energy in Jordan

	OR	Robust Std. Errors
Female Top Manager	0.553	0.749
Age of Top Manager (Ref: + 60)		
18-29	0.412***	0.130
30-59	0.677*	0.156
Education of Top Manager (Ref: Primary or Less)		
Secondary Education	1.198	0.280
Intermediate/Diploma	1.065	0.306
University Degree and Above	0.940	0.214
Firm has Tax Registration	0.815	0.137
Firm Size (Ref: Less than 5 workers)		
6-19 Workers	1.789***	0.337
20-99 Workers	1.951***	0.537
Sector of Activity (Ref: Agriculture)		
Industrial	0.660	0.326
Services	0.933	0.443
ICT	0.524	0.327
Financial	0.244**	0.164
Education	0.792	0.403
Others	0.467	0.271
Construction	0.728	0.388
Share of Electricity Bill in Total Operational Cost	0.788	0.114
Firm in Urban Areas	0.558***	0.110
Female Top Manager Aged 18-29	1.152	1.503
Female Top Manager Aged 30-59	2.018	1.990
Female Top Manager with Secondary Education	1.010	1.405
Female Top Manager with Intermediate/Diploma Education	0.358	0.515
Female Top Manager with University Education	0.990	0.990
Female Top Manager in Formally Registered Firm	0.667	0.667
Constant	1.185	1.185

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

A final model⁵ is estimated with a dependent variable that equals one if the firm agrees or strongly agrees to invest in RE technologies and the same explanatory variables as the original model for each country. The results in Egypt show that being a female top manager with a university degree or higher decreases the odds of agreeing to invest in clean energy. These are the same results found earlier for the clean energy transition model, which requires more investigation. In Jordan and Morocco, the gender of the manager has no significant effect on the decision to invest in RE.

The analysis shows that the reasons why firms consider using clean energy and RE vary among the countries. Figure 6 shows that the first reason for considering investing in RE in Egypt and Morocco is the improvement of the firms' energy efficiency. In Egypt and Morocco, 73 percent and 88 percent of the firms who consider using clean energy (strongly) agree that adopting RE technologies would improve their energy efficiency, respectively. In Jordan, the first reason is that the use of RE technologies would reduce energy costs, with 90 percent of the firms (strongly) agreeing with this statement.

⁵The results are available upon request.



Table 3. The estimated odds ratio of the logit model of considering using clean energy in Morocco

	OR	Robust Std. Errors
Female Top Manager	0.343	0.527
Age of Top Manager (Ref: +60)		
18-29	1.058	0.448
30-59	1.065	0.238
Education of Top Manager (Ref: Primary or Less)		
Secondary Education	1.462	0.455
Intermediate/Diploma	2.091**	0.733
University Degree and Above	1.327	0.314
Firm has Tax Registration	0.939	0.438
Firm Size (Ref: Less Than 5 Workers)		
6-19 Workers	1.193	0.188
20-99 Workers	1.680**	0.342
Sectors (Ref: Industrial Sector)		
Services	1.318	0.247
ICT	0.980	0.267
Financial	1.246	0.323
Education	0.969	0.224
Others (including Agriculture and Construction)	1.488	0.431
Share of Electricity Bill in Total Operational Cost	1.057	0.167
Firm in Urban Areas	1.466	0.558
Female Top Manager Aged 18-29	13.692**	17.139
Female Top Manager Aged 30-59	6.847*	7.857
Female Top Manager with Secondary Education	0.142*	0.142
Female Top Manager with Intermediate/Diploma Education	0.664	0.729
Female Top Manager with University Education	0.222**	0.170
Female Top Manager in Formally Registered Firm	1.389	1.776
Constant	0.222**	0.149

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

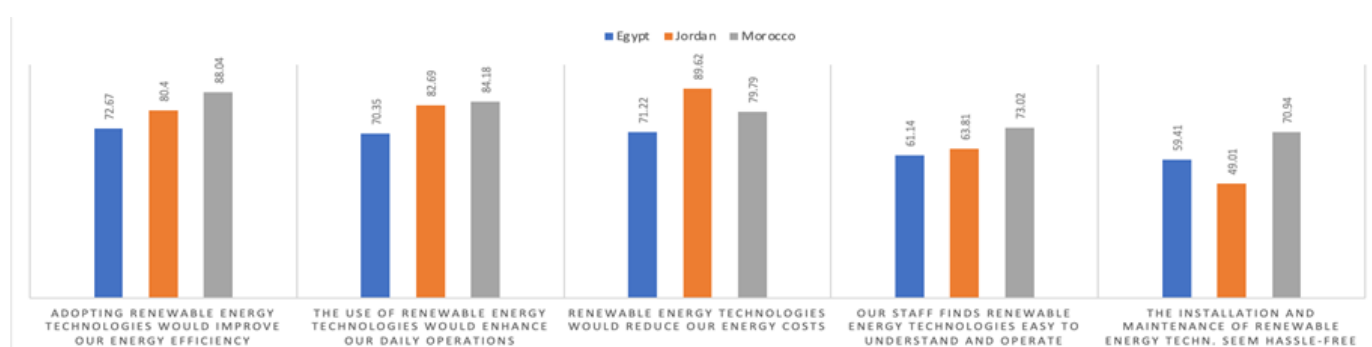


Table 4. The estimated odds ratio of the logit model of considering using clean energy in the three countries

	OR	Robust Std. Errors
Female Top Manager	0.651**	0.117
Age of Top Manager (Ref: +60)		
18-29	0.682**	0.124
30-59	0.839	0.111
Education of Top Manager (Ref: Primary or Less)		
Secondary Education	1.212	0.182
Intermediate/Diploma	1.189	0.210
University Degree and Above	1.212	0.163
Firm has Tax Registration	0.833	0.093
Firm Size (Ref: Less than 5 Workers)		
6-19 Workers	1.468***	0.148
20-99 Workers	1.617***	0.228
Sectors (Ref: Agriculture Sector)		
Industrial	0.636	0.206
Services	0.743	0.235
ICT	0.639	0.235
Financial	0.596	0.219
Education	0.604	0.203
Construction	0.705	0.261
Others	0.563	0.205
Share of Electricity Bill in Total Operational Cost	0.910	0.080
Firm in Urban Areas	0.705**	0.099
Firm in Jordan	2.072***	0.252
Firm in Morocco	1.975***	0.260
Female Top Manager in Jordan	1.235	0.360
Female Top Manager in Morocco	1.442	0.370
Constant	0.627	0.229

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 6. Reasons for investing in RE (prevalence of firms that (strongly) agree - %)



Source: ERF Renewable Energy Firm Surveys for Egypt, Jordan, and Morocco.



5. Discussion and conclusion

Women in the MENA region can play key roles in countries' efforts to transition to clean energy, and in broader efforts to halt climate change. However, the quantitative results show that having a female manager, high female ownership, or full-time female employees is not enough to achieve this goal. Significant determinants of the transition to clean energy include the age of the top manager, the size of the firm, and the sector of operation. The results vary across the three countries, showing that the macro and institutional contexts are key drivers in the clean energy transition, not only the gender or characteristics of the top manager.

What this finding shows is that including women in any sector—without using a gender perspective and without raising awareness or building commitment to transitioning to clean energy or halting climate change and addressing its consequences—would not have a significant positive impact. Rather, an adequate institutional environment is what is required to achieve this goal. There is a relatively conducive environment for achieving a better role for women in the energy sector in the MENA region, given global and regional commitments to an integrated approach to addressing climate change. These are evident in the 2030 Agenda (the SDGs), and in the World Bank Group's "Climate Change Action Plan 2021-2025: Supporting Green, Resilient, and Inclusive Development." To achieve a meaningful transition to clean energy, it is important to challenge existing inequalities and injustices in the MENA region and globally.

Initiatives like Solar Sister, Barefoot College's "solarmama" program, and Kopernik's Wonder Woman program have existed for a long time in the decentralized off-grid RE space and they have improved poor communities' access to technologies like solar cookers and solar lanterns. They've also provided income opportunities for women who often lacked better options. Alongside supporting such programs, there is a critical need within the energy sector to involve more women who are committed to gender equality and climate justice in technology design, engineering, innovation, and policymaking.

An intersectional approach that accounts for gender, race, and ethnicity, and other aspects of difference, depending on the setting is critical to designing technologies that address the needs of diverse users. Transition to clean

energy and climate justice in the MENA region and beyond hinges on ensuring an active role for women entrepreneurs, women's organizations and movements, and grassroots organizations working in the intersection of the areas of gender equality and climate change.

References

- Adejumo, Q. (2023). Empowering Women in Clean Energy: A New Initiative in the Middle East and North Africa. The People's Network. 28 September. <https://bnnbreaking.com/world/algeria/empowering-women-in-clean-energy-a-new-initiative-in-the-middle-east-and-north-africa/>
- Ali, N. (2022). Gender Equality, Women's Education, and Women's Labor Force Participation in the MENA Region. Presentation – ERF Commission, June.
- Barre, A., Dankelman, I., Stock, A., Blomstrom, E., and Burns, B. (2018). From Marrakesh to Marrakesh: The Rise of Gender Equality in the Global Climate Governance and Climate Action. In S. Duyck, S. Jodoin, and A. Johl (Eds.), *Routledge Handbook of Human Rights and Climate Governance* (pp. 239-250). Routledge.
- Beides, H. and Maier, E. (2022). Getting More Women into the Energy Sector: A RENEWed Approach for MENA. Arab Voices on World Bank Blogs. July.
- Belghiti-Mahut, S., Lafont, A-L., and Yousfi, O. (2016). Gender Gap in Innovation: A Confused Link? *Journal of Innovation Economics and Management* 2016/1 (no. 19), pages 159 and 177. Éditions De Boeck Supérieur DOI 10.3917/jie.019.0159.
- Diwan, Ishac and Irina Vartanova (2017, Jne). The Effect of Patriarchal Culture on Women's Labor Force Participation. *Economic Research Forum Working Paper No. 1101*.
- Dibeh, G., Fakh, A., Marrouch, W., and Matar, G. (2021). Who Cares about Environmental Quality in the MENA Region? *Social Indicators Research*, 157(2), 603-629
- Energia (2022). Challenging Gender Norms through Innovation in Clean Energy. August 10. <https://energia.org/challenging-gender-norms-through-innovation-in-clean-energy/>
- Hanna, T., Meisel, C., Moyer, J., Azcona, G., Bhatt, A., Duerto Valero, S., & Meagher, A. (2023). Forecasting Time Spent in Unpaid Care and Domestic Work. UN Women.
- International Labor Organization (ILO) and UN Women (2022, March 8). Over 2 million Moms Left the Labour force in 2020 According to New Global Estimates. <https://ilostat.ilo.org/blog/over-2-million-moms-left-the-labour-force-in-2020-according-to-new-global-estimates/>
- ILO (2020, January 10). Gender equality in the workplace remains elusive. www.ilostat.ilo.org
- ILO (2017). Economic Impacts of Reducing the Gender Gap. Research Briefing # 10. www.ilo.org
- Johnson, O., Yi-Chen Han, J., Knight, A., Mortensen, S., Thazin Aung, M., Boyland, M., Resurrección, B. (2020). Intersectionality and Energy Transitions: A Review of Gender, Social Equity and Low-Carbon Energy. *Energy Research and Social Science* 70 (2020) 101774.



- International Renewable Energy Agency (IRENA) (2020). Wind Energy, A Global Perspective. IRENA.
- IRENA (2019). Renewable Energy: A Gender Perspective. IRENA, Abu Dhabi.
- Khattabi, A., Matah, M., and Huber, S. (2014). Gender Inequality in the Context of Climate Change: The Case of the Boudinar Commune in Morocco. In M. Abdelali-Martini and A. Aw-Hassan (eds.), *Gender Research in Natural Resource Management* (pp. 146-183). Routledge.
- Kubursi, A. and Abou Ali, H. (2024). Potential Employment Generation Capacity of Renewable Energy in MENA. ERF Paper. January.
- Kvinna Till Kvinna Foundation (2022). *Feminist Movements and Climate Justice in the Middle East and North Africa*. Kvinna Till Kvinna Foundation, October.
- Maathai, W. (2010). *The Challenge for Africa*. Arrow Books.
- Maathai, W. (2004). *The Green Belt Movement: Sharing the Approach and the Experience*. Lantern Books.
- Matano, H. (2022). Clean Energy for Women, by Women. World Bank Blogs. <https://blogs.worldbank.org/voices/clean-energy-women-women>
- Mottaghi, Lili et. Al. (2021, May). Why is Female Labor Force Participation Low and Stagnant in MENA? Experimental Evidence from Egypt. World Bank.
- Sileem, H. (2020). The Existence of Modified Environmental Kuznets Curve for Gender Inequality in the MENA Economies: Panel Data Model. In M. Mateev and J. Nightingale (Eds.), *Sustainable Development and Social Responsibility—Volume 1: Proceedings of the 2nd American University in the Emirates International Research Conference, AUEIRC'18–Dubai, UAE 2018* (pp. 239-245). Springer International Publishing.
- Sileem, H., and Al-Ayouty, I. (2022). The Effect of Gender Equality on the Carbon Intensity of Well-Being: Panel Data Analysis for the MENA Economies 1995-2018. *Journal of Chinese Economic and Foreign Trade Studies*, 15(3), 239-260.
- Sepúlveda, M. (2024). Addressing Gender Inequality in Climate Response. *International Politics and Society*. 6 June. <https://www.ips-journal.eu/topics/economy-and-ecology/addressing-gender-inequality-in-climate-response-7367/>
- Shannon, G., Jansen, M., Williams, K., Cáceres, C., Motta, A., Odhiambo, A., Eleveld, A., and Mannell, J. (2019). Gender Equality in Science, Medicine, and Global Health: Where Are We at and Why Does it Matter? *Lancet* 2019; 393: 560-69.
- United Nations Educational, Scientific, and Cultural Organization (UNESCO) (2024). *Global Education Monitoring Report: Gender Report - Technology on Her Terms*. Paris, UNESCO.
- United Nations Climate Change (2022). *Gender and Climate Change: An Important Connection*. <https://unfccc.int/gender>. Visited 16 November 2023.
- UN Women (2022). *Women, Gender Equality and Climate Change* https://www.un.org/womenwatch/feature/climate_change/downloads/Women_and_Climate_Change_Factsheet.pdf. Visited 16 November 2023.
- United Nations (2023). *What is Renewable Energy?* <https://www.un.org/en/climatechange/what-is-renewable-energy>. Visited on 16 November 2023.
- United Nations (1992). *Report of the United Nations Conference on Environmental Development*. Rio de Janeiro 3-14 June. UN, New York. Vol. 1, Resolutions.
- United Nations Development Programme (UNDP) (2023). *Energy and Gender Equality*. <https://www.undp.org/energy/our-work-areas/energy-and-gender-equality>. Visited on 16 November 2023.
- World Bank (2024). *Women, Business, and the Law 2024*. World Bank Group.



About the Authors

Nada Mustafa Ali is an Assistant Professor in the School for Global Inclusion and Social Development at the University of Massachusetts, Boston. She is an interdisciplinary scholar who uses Black feminist theory and decolonial theory, to engage with questions of power and the intersection of gender, race, social class, disability, and other aspects of difference. Her research covers the themes of conflict, global health and human rights, climate change, social movements organizing, and the politics of care. Dr. Ali has written extensively in both Arabic and English. She is the co-author of ERF's (2022) Gender and Sudan's 2018/2019 Uprising. Her book *Gender, Race and Sudan's Exile Politics: Do We All Belong to this Country?* was published by Lexington Books in 2015.

Racha Ramadan is a Professor of Economics at the Faculty of Economics and Political Science, Cairo University and the representative of the Agence Universitaire de la Francophonie in Egypt. She worked as a consultant for different international organizations as the World Bank and UN-ESCWA. She is an ERF research fellow and a fellow of the Summer Program in Social Science (SPSS) at the Institute for Advanced Study in Princeton. She has several papers published in peer reviewed journals as *Review of Income and Wealth*. Her research interests include applied micro-econometrics on poverty, inequality, food security, gender and human development in developing countries.



ERF at a Glance: *The Economic Research Forum (ERF) is a regional network dedicated to promoting high-quality economic research for sustainable development in the Arab countries, Iran and Turkey. Established in 1993, ERF's core objectives are to build a strong research capacity in the region; to encourage the production of independent, high-quality research; and to disseminate research output to a wide and diverse audience. To achieve these objectives, ERF's portfolio of activities includes managing carefully selected regional research initiatives; providing training and mentoring to junior researchers; and disseminating the research findings through seminars, conferences and a variety of publications. The network is headquartered in Egypt but its affiliates come primarily from different countries in the region.*

Contact Information

ERF Office

Address: 21 Al-Sad Al-Aaly St. Dokki, Giza, Egypt

PO Box 12311

Tel: +202 333 18 600 - 603

Fax: +202 333 18 604

Email: erf@erf.org.eg

Website: <http://www.erf.org.eg>

Follow us



[economic-research-forum](https://www.linkedin.com/company/economic-research-forum)



[ERFLatest](https://twitter.com/ERFLatest)



[TheERFLatest](https://www.youtube.com/channel/UCqWz8v8v8v8v8v8v8v8v8v8)



www.erf.org.eg

