

# The role of Saudi women in advancing environmental sustainability: a case study of Riyadh, Saudi Arabia

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## Abstract

**Purpose** – A structured questionnaire was used in this study, which clarifies demographic, attitudinal and driver factors that influence their interest in environmental sustainability. The target population sampled in the study is predominantly teachers. They are aware of their influence in society but accept the necessity of expanding it beyond this professional group.

**Design/methodology/approach** – This research analyses the attitudes, barriers and prospects of 154 Saudi women in Riyadh, who are mostly educators, aged between 18 and 58, in Saudi Arabia towards implementing environmental sustainability.

**Findings** – The analysis delves into the role that higher education (76.0% with a bachelor's, 22.0% with a master's or doctoral degree) plays in environmental consciousness. Correlation results suggest that there is a significant connection between active engagement and personal barriers, benefits for future generations and perceived demand for improved environmental education. The study indicates diverging opinions on different aspects and a lack of interest in collaboration. The results of the correlation analysis support relationships between women's contributions to environmental sustainability and policy changes, which also suggest the need for subtle interpretations. There are also priorities like increasing the scope of involvement, improving policymakers' understanding of factors affecting women's participation and developing holistic initiatives that address roles in greater detail.

**Originality/value** – This study's distinctive contribution resides in its correlation analysis, which uncovers associations between women's contributions, policy changes and the requirement for subtle interpretations. This underscores the importance of comprehensive initiatives and increased participation.

**Keywords** Policy impact, Correlation analysis, Cultural context, Participation challenges, Inclusive initiatives

**Paper type** Research paper

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## Introduction

The incorporation of the environmental dimension into the economic realm has transformed the economic progress technique, reorienting it from the simple extraction of limited resources to the fulfilment of numerous human demands and the adoption of the idea of sustainable development (Johnson and Schaltegger, 2019; Belloumi and Alshehry, 2020; Ruggerio, 2021). This concept emphasises the need for environmental protection and resource preservation. The concept of sustainable development is to meet the demands of the present without jeopardising future generations' ability to meet their own needs (Sakalasooriya, 2021). Sustainable development emphasises the importance of ensuring that the work of restoring the environment that has been damaged by previous generations does not fall solely on the shoulders of future generations (Baumgartner and Rauter, 2017). There are two types of economic development theories: those that incorporate environmental considerations and call this approach "green development," and those that simply focus on economic growth and the exploitation of environmental resources for financial gain.

Saudi Arabia is a country in the Middle East that relies heavily on oil exports for both government spending and economic growth. Saudi Arabia is a desert country with limited agricultural and water resources (Ouassaf *et al.*, 2023). As a result, the government relies heavily on revenue from the oil industry to fund food imports and water desalination, both of which are critical to its survival (Hajimineh and Moghani, 2023). As a result, the vulnerability of the environment and the economy is at the heart of every effort to solve the challenge of climate change. The problem for policymakers is how to ensure economic development and progress while meeting climate change goals.

Saudi Arabia has demonstrated that it is making significant efforts to safeguard its natural resources and environment. Environmental conservation is a critical component of the effort to solve environmental concerns (Chaaben *et al.*, 2022). Climate change is an important aspect of the environment. Saudi Arabia's environmental protection aims, among other things, include specific efforts to reduce air pollution, monitor air quality and ameliorate water pollution (Farahat, 2016; Baig *et al.*, 2020; Arnout, 2022). Most Saudi Arabian ecosystems, on the other hand, are extremely vulnerable, with few renewable water supplies and a heavy reliance on fossil fuel exports. As stated in its 2030 vision Saudi Arabia is aggressively addressing these concerns as a result of its sensitivity to climate change by determining the root causes of the phenomenon and implementing necessary solutions (Hereher, 2015; Saudi Green Initiative, 2023).

Recently, Saudi Arabia's enormous historical and culturally varied territory has undergone unprecedented changes. The main principle of this vision is to empower women, who are a revolutionary force capable of improving nearly any industry (Alqahtany and Aravindakshan, 2021; Al-Nasrallah, 2023). Riyadh, representing the nation's capital and a reflection of its rapid growth, is an indispensable focal point for studying these changing trends. The city of Riyadh combines traditional values with modern-day comforts, and brings together timeless values with modern-day standards (Aldegheishem, 2023). Meanwhile, it offers women a stage on which to drive social change there. Although women still adhere to well-defined rules, they are more and more seen as agents of change.

Women in Riyadh who work in various fields to promote environmental sustainability are not well known. Research on women in Riyadh involved in community-based initiatives and awareness campaigns to support environmental sustainability is scarce (Zamin *et al.*, 2023). Understanding the obstacles Saudi women might encounter in their pursuit of environmental sustainability is crucial to our research. Social norms and limited resources could be problematic. Traditions and social mores could also play a role. Moreover, these challenges

offer public society, corporations and lawmakers an opportunity to enact regulations that have the potential to revolutionise the field (Sonbol, 2018; Abdelwahed *et al.*, 2022).

The study aims to analyse and address issues in Riyadh's environmental sustainability, focusing on the contributions of Saudi women. It examines ongoing programs and community efforts led by women, emphasising their roles in fostering environmental consciousness. By encouraging their participation, the study explores potential benefits and challenges for Saudi women. It seeks to present a comprehensive view of Riyadh women's perspectives on environmental sustainability issues and solutions.

### Theoretical framework for environmental sustainability

Environmental sustainability means that to support health and well-being in the now and the future, it is our responsibility to protect natural resources and global ecosystems. Being forward-looking is a defining characteristic of environmental sustainability because many decisions that impact the environment have long-term effects (Cao *et al.*, 2021; Ahmad *et al.*, 2023). Sustainability, according to the U.S. Environmental Protection Agency, is the capability to meet current needs without endangering the ability of future generations to meet their own (Onkangi and Getugi, 2020). Multinational companies successfully reduce emissions in areas with rigorous environmental regulations, but they may emit more pollutants in nations with laxer regulations, according to a study published in the Harvard Business Review (Dzhengiz and Niesten, 2019).

It is increasingly obvious that excessive consumption negatively affects people's well-being. The GDP grows together with an increase in energy consumption, which leads to higher pollution levels and the degradation of natural resources. The concepts of sustainability are compatible with some types of growth. Businesses that promote renewable energy provide a wealth of job opportunities. Profit margins can be increased by lowering energy usage and using less plastic during manufacture (Eisenmenger *et al.*, 2020; de Oliveira *et al.*, 2023). Embracing this mindset requires forward-thinking outlooks and corporate cost-benefit analyses to take environmental effects into account. But achieving this synchronisation is an investment in an emerging market where companies may thrive.

### *The role of women in environmental sustainability: A global perspective*

Historically, women have played pivotal roles in ensuring family and community well-being and overseeing resource distribution across cultures. Policymakers must shift from viewing women as disadvantaged to recognising their potential, facilitating access to resources, decision-making roles and technology training (Arceo-Gomez *et al.*, 2022; Santoniccolo *et al.*, 2023). Gender equality is not only a cornerstone of sustainable development but also a fundamental human right.

Before the 18th and 19th centuries, women were often excluded from environmental stewardship and broader social spheres (Mago and Gunwal, 2019). Their awareness of rights and responsibilities regarding environmental degradation sparked resistance and leadership in environmental and conservation efforts (do Livramento Gonçalves *et al.*, 2019). Women exhibit heightened sensitivity to climate change and possess valuable knowledge for both mitigating and adapting to its impacts. Current discourse emphasises their vulnerability to climate change and the potential benefits of integrating their experiences into programming (Jerneck, 2018; Asongu *et al.*, 2022). Efforts to combat climate change must increasingly incorporate women's economic empowerment to be effective.

### *Historical overview of Saudi women's involvement in environmental sustainability*

The evolution of social norms, traditions and structures has impacted the proficiency of Saudi women in environmental stewardship. Women in Saudi Arabia have significant challenges in accessing education and obtaining work (Alghamdi *et al.*, 2022). This hinders their ability to contribute to maintaining environmental safety. Furthermore, individuals in our culture are increasingly embracing the variances between males and females. As Saudi women acquired knowledge and assistance, they began to participate in a greater number of tasks as well (Rizvi and Hussain, 2021). This encompasses aiding in the preservation of the environment's integrity.

### *Current role of Saudi women in environmental sustainability activities in Riyadh*

Riyadh, a major metropolis in Saudi Arabia, exemplifies the increasing participation of women in several roles pertaining to environmental conservation. Women in Riyadh are collaborating to promote environmental conservation. Various activities, ranging from small-scale local teams to large-scale initiatives, involve the participation of women. An encouraging observation is the rapid growth of female-led groups in Riyadh that are addressing environmental issues. These entities are intended to address issues such as air pollution, deforestation and climate fluctuations (Ghasemi *et al.*, 2021). These activities not only benefit the environment but also enhance women's empowerment.

### *The impact of local and national policies on women's participation in environmental sustainability*

Women's participation in environmental sustainability initiatives is shaped by the policies that are made at local and national levels. A lot of countries nowadays, including my country Saudi Arabia, realised the significance of taking into account the views of women when making environmental policies (Hervías Parejo and Radulović, 2023). Policies that we learn in school usually concentrate on the equality of genders, acknowledging women as the crucial members of the decisions that concern the environment. Kingdom of Saudi Arabia is undergoing some reforms to promote women's power and provide them more chances to contribute in different fields like environmental sustainability too (Chaaben *et al.*, 2022).

### *Policy gaps and opportunities for improvement*

A problem with policies for women related to nature is that these rules stop them from using all their skills fully. This makes it harder for them to help save the environment long-term. Often, these differences happen because of unclear explanations, weak rules and not enough money to support activities for men and women (Mago and Gunwal, 2019). By fixing these problems, we have a chance to improve rules and help more women join activities that are good for the environment. This challenge comes from the need to create rules that really deal with how gender and environmental issues connect.

### *Strategies to enhance women's involvement in environmental sustainability*

Helping women with learning and skills is a key way to get them more involved in making our world last. Teaching programmes that focus on caring for the environment, green activities and becoming a leader prepare women with the needed skills to take part in making better answers.

It is very important to help people learn things outside of school, such as teaching new skills and giving guidance (Leal Filho *et al.*, 2022). These programmes can help women feel

more confident, allowing them to lead environmental groups and community activities. Women leaders can help make strong laws that bring good changes at local or large levels.

### Methodology

The researcher gathered data through a questionnaire covering various demographic aspects, including societal and cultural factors, current policies and community support related to environmental education, media influence and technology's impact.

#### *Study design*

A quantitative survey-based research design was adopted in this study. This research design was selected because it is efficient in collecting a considerable quantity of data from a considerable number of participants to understand the overall patterns and trends Saudi women are contributing towards environmental sustainability.

The survey consists of both demographic details and a set of closed-ended questions. The demographic information provides the background of participants, while the closed-ended questions provided specific data connected to the research objectives. Close-ended questions are facilitated by the use of a Likert scale, which makes it possible to gather subtle information on attitudes and perceptions among participants. This five-point scale ranges from "strongly disagree" to "strongly agree", where respondents can provide their level of agreement with each question.

Quantitative survey-based research design is justifiable since it enables standardised data to be collected, thus making it easy for one to identify trends and compare with others. It also helps the researchers access a large number of participants, which increases their generalisability (Newton, 2023). In addition, the use of a questionnaire guarantees that similar information is obtained from all subjects, hence increasing the reliability of the data collected.

#### *Study sample*

The study sample for this research is 154 Saudi women in Riyadh, the capital city of Saudi Arabia. This sample is of particular interest because of their unique position in a fast-changing sociocultural and environmental context. Because this group is addressed, it allows delving into the impact they made on environmental sustainability and factors affecting their participation.

The inclusion criteria for the study are Saudi women aged 18 years and older, residing in Riyadh, who either work or pursue education. This is to ensure that the participants are somewhat independent and will likely participate in activities related to environmental sustainability. Men, women less than 18 years old and non-Riyadh residents are the exclusion criteria. This is to keep the focus on adult Saudi women's experiences and viewpoints from Riyadh.

This specific study sample was chosen for the fact that it allows a targeted analysis of the research purposes. Through the study of this group, a viewpoint on how important Saudi women are to environmental sustainability, what challenges they face and potential ways of enhancing their participation. This is important in guiding policy and practice on women and environmental sustainability.

#### *Data collection*

The study used a structured questionnaire distributed via Google Forms for data collection, encompassing demographic details and closed-ended Likert scale questions. Targeting Saudi

women aged 18 and above in Riyadh, the method facilitated comprehensive insights into their perspectives on environmental sustainability. Participants consented to participate, were informed of the study's purpose, and assured of confidentiality. The research also prioritised cultural sensitivity in questioning, upholding ethical standards to protect participants' rights and research integrity.

The research process includes obtaining approval from an institutional review board to ensure that the study complies with all ethical guidelines. In addition, the demographic section of the questionnaire includes education as a mandatory field, which helps in understanding the educational background of the participants and its potential impact on their interest in environmental preservation.

*Data analysis*

Data analysis began with data cleaning to eliminate incomplete or inconsistent responses. This was followed by data coding, where responses were assigned numerical values to facilitate analysis. Microsoft Excel was used for statistical analysis due to its robust capabilities in handling large data sets. Descriptive statistics and correlation analyses were performed to interpret the data accurately. Excel's features ensured precise analysis, enhancing the validity and reliability of the study's findings and enabling a comprehensive understanding of the participants' views and behaviours regarding environmental sustainability.

*Reliability and validity*

The questionnaire demonstrated high internal consistency with a Cronbach's alpha of 0.899, indicating strong reliability. Its validity was ensured through careful alignment with the research objectives, ensuring content validity. The Likert scale enabled nuanced responses, enhancing construct validity. A pilot test identified and resolved potential issues, further enhancing reliability and validity. Overall, the questionnaire is reliable and valid for use in the study, supported by its robust design and feedback-driven improvements.

**Results and discussion**

*Demography*

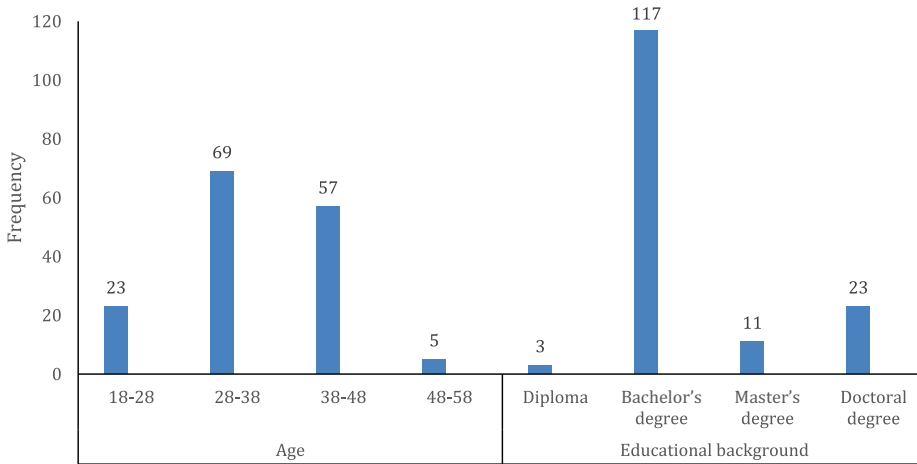
The results of the demographic data are shown in [Figure 1](#). The research concentrates on women in various age groups: 18–28 (14.9%), 28–38 (44.8%), 38–48 (37.0%) and 48–58 (3.2%). 44.8% of respondents were in the age range 28–48, with it being the most represented age group among all participants. These women, being highly active in the career stage of life, are inclined to be more current with societal issues including environmental sustainability.

The participants' high level of education could shape their understanding of environmental sustainability. Higher education, held by 76.0% of the participants with a bachelor's degree and 22.0% with a master's or doctoral degree, often provides individuals with critical thinking skills and a broader understanding of global issues. This could lead to a more profound understanding of environmental sustainability. However, only 1.9% of the participants in the survey have a diploma certificate.

The study primarily focuses on educators, who play a vital role in shaping societal attitudes. Teachers, who make up 100% of the participants, can influence their students' attitudes towards environmental sustainability.

*Insights into Saudi women's perceptions and roles*

The descriptive statistics ([Table 1](#)) show the differences in views about environmental issues among Saudi women, demonstrating both personal and professional problems. It is



Source: Author's own work

**Figure 1.** Demographic distribution of participants of the survey

**Table 1.** Descriptive analysis of perceptions and roles of Saudi women in environmental sustainability in Riyadh

|                     | Mean | SD   | Degree | Order |
|---------------------|------|------|--------|-------|
| A1                  | 3.77 | 0.86 | Agree  | 5     |
| A2                  | 3.82 | 1.44 |        | 2     |
| A3                  | 3.51 | 1.44 |        | 7     |
| A4                  | 3.57 | 1.50 |        | 6     |
| A5                  | 4.10 | 1.52 |        | 1     |
| A6                  | 3.81 | 1.51 |        | 3     |
| A7                  | 3.80 | 1.45 |        | 4     |
| Perception and role | 3.77 | 0.86 |        |       |

Notes: (N = 154); NB = A1–A7 are codes for questions

Source: Author's own work

generally agreed that the cultural environment greatly affects women's participation (Jayachandran, 2021). Nevertheless, the large standard deviation (SD) indicates that a wide variation can be observed in individual cases. The broad scope of respondent's statements reflects the wide spectrum of beliefs among the environmental sustainability community, even though they generally expressed contentment with the government support and sustainable practices members of the community took into account in their everyday activities.

There is a variation in how individuals perceive the significance of environmental sustainability (A1). The average for this category is 3.77, with an SD of 0.86. This suggests that participants generally believe that there are variations in how individuals assess the value of environmental sustainability, as noted by Du *et al.* (2021). The moderately large SD signifies moderate discrepancies within the responses.

I have faced personal or professional barriers in contributing to environmental sustainability (A2): The mean in this category is moderate at 3.82, with a larger SD of 1.44. This implies that although respondents overall tend to state that at least they have confronted personal or professional barriers to contributing to environmental sustainability, there is a high degree of diversity in opinions and experiences regarding this particular issue (Almathami *et al.*, 2020).

It is important to instil a sense of environmental responsibility in future generations (A3): This category has the lowest mean score of 3.51 and an SD of 1.44. While there is a shared recognition of the importance of fostering environmental awareness in upcoming generations, opinions vary on the most effective methods to achieve this objective(s).

There is a need for increased environmental education in schools and universities (A4): The mean is 3.57 for this category, with an SD of 1.50. This implies that respondents' generally thought there is a demand for an increase in environmental education in schools and universities, but opinions range as to the depth and type of this need.

The cultural context influence women's involvement in environmental sustainability (A5): For this category, the mean score is 4.10, the largest score among the categories, with an SD of 1.52. This indicates a high consensus among respondents regarding the fact that cultural background impacts women's engagement in environmental sustainability this is also supported by the report of Sen (2020) and Kumari *et al.* (2020). The large SD points to the large span of behaviours and views relating to this issue.

I am satisfied with the current level of government support for women involved in environmental sustainability (A6): The mean score for this category is 3.81, with an SD of 1.51. This suggests that respondents are generally satisfied with the current level of government support for women involved in environmental sustainability, but there is a wide range of opinions on this issue.

I incorporate sustainable practice into your daily life (A7): This category has an average score of 3.80 with an SD of 1.45. This implies that most respondents tend to say that they have the habit of implementing sustainable patterns into their daily lives; however, people have varied perceptions and conclusions related to this topic.

Based on the findings, the participants seem to agree on the issues in question because they agree with every statement. However, a prominent element is the broad range of experiences and perspectives that develop on such topics. The most distant level of consensus is observed concerning the cultural context and women's efforts as regards environmental sustainability. Many of the respondents acknowledge that cultural factors hold a strong influence on the women who are driving their roles in environmental projects (Shahhosseini and Taghizadeh Mosen, 2021). Such a lack of consensus over environmental responsibilities among future generations becomes apparent (Ahmad *et al.*, 2021). Though there is a recognition that environmental stewardship matters, the opinion on how to mould this knowledge varies. This shows the complexity of environmental sustainability and the variety of approaches used by people (Syropoulos and Markowitz, 2021).

Table 2 shows the Pearson correlation coefficients between the current occupational roles of females in environmental sustainability in Riyadh city and a number of other factors. The table represents the *p*-value of correlation analysis and two-tailed values that find a strong relationship between other factors and Saudi women's environmental sustainability responsibilities in Riyadh.

For A1, a correlation coefficient of 0.999 indicates a perfect positive relationship. This implies that as the influence of Saudi women on environmental sustainability increases, there

**Table 2.** Correlation analysis of perceptions and roles of Saudi women in environmental sustainability in Riyadh

|    | A1    | A2    | A3    | A4    | A5    | A6    | A7    |
|----|-------|-------|-------|-------|-------|-------|-------|
| A1 | 1.000 |       |       |       |       |       |       |
| A2 | 0.999 | 1.000 |       |       |       |       |       |
| A3 | 0.886 | 0.886 | 1.000 |       |       |       |       |
| A4 | 0.903 | 0.903 | 0.903 | 1.000 |       |       |       |
| A5 | 0.876 | 0.876 | 0.876 | 0.876 | 1.000 |       |       |
| A6 | 0.191 | 0.191 | 0.191 | 0.191 | 0.191 | 1.000 |       |
| A7 | 0.220 | 0.220 | 0.220 | 0.220 | 0.220 | 0.263 | 1.000 |

**Note:** NB = A1–A7 are codes for questions

**Source:** Author's own work

is a corresponding increase in the belief that there is an insurmountable gap between the views that men and women hold regarding the value of environmental sustainability (Ramstetter and Habersack, 2019). For A2, the high correlation coefficient of 0.886 shows a positive relationship. This implies that a higher level of engagement by women in environmental sustainability increases the chances of them facing personal or professional barriers, this is also in agreement with report of James *et al.* (2021). For A3, the value of 0.903 of the correlation coefficients shows a significant positive relationship. This implies that women, as a crucial aspect of environmental sustainability, also uphold the need for a sense of environmental responsibility that should be developed in the coming generations.

For A4, the correlation coefficient of 0.876 strongly correlates positively. This implies, therefore, that, due to the reality that many women have an active role in environmental sustainability, they also need more environmental education in schools and universities. For A5, a very weak positive relationship between the variables is found from the value of 0.191 of the correlation coefficients. This implies that though the cultural environment is a potential influencing factor on women's participation in environmental sustainability, it is not as strongly determined as the other elements.

For A6, the 0.220 correlation coefficient points out a weak positive correlation. This means that women who are more active in environmental sustainability are slightly more likely to be satisfied with the levels of government support that they receive (Ramstetter and Habersack, 2019). For A7, because the correlation coefficient is 0.263, the relationship is positive, and it is weak. This in turn implies that higher investment in environmental sustainability behaviour among women might slightly increase the probable likelihood of practising sustainability in daily life.

Through the analysis, all factors tested are seen to have significant correlations, with four variables having extremely high correlation values ( $p$ -values < 0.00). Two other factors have a lesser correlation ( $p$ -values of 0.018 and 0.006) but still play an important role statistically speaking. All variables show positive correlations with efficacy, suggesting that they greatly impact the results. Female participation in the sustainability programmes of Riyadh is closely linked to multiple aspects that influence their involvement, such as shared understanding of environmental issues and level of engagement (Abdelwahed *et al.*, 2022). The level of involvement is also associated with the degree to which they are engaged in personal and professional spheres. This thus implies that the challenges that they have to overcome may significantly influence their involvement in environmental sustainability (Ajibade and Boateng, 2021).

There is a strong correlation between the implementation of environmental accountability for future generations and the willingness to pursue activities in sustainability. To the extent to which their positions require engagement in sustainability initiatives, ecological education serves as a prerequisite for active participation (Kumari *et al.*, 2020). The interactions between the factors portray socio-politics impacting women’s engagement in environmental sustainability in Riyadh.

*Insights into Saudi’s women societal cultural and technological factors*

This study investigates several perspectives on the numerous factors that affect women’s participation in environmental sustainability duties. The respondents’ insights shed light on important topics, such as the community’s significant influence and the role of norms and media in their lives. Table 3 examines the factors of incentives, collaboration, societal forces and technology to fully understand the complexities that drive women towards environmental sustainability.

Community support plays a significant role in the success of such initiatives (B1): A mean score of 3.94 indicates that respondents in general believe that community support has a considerable impact on the success of environmental sustainability projects (Ekarini and Koestoer, 2022). 1.40 SD means that there was moderate variation among people’s answers. Cultural factors hinder women’s involvement in such initiatives (B2): The average score of 3.69 indicates that, on the whole, respondents consider that cultural factors interfere with women’s participation in such projects. With the SD of 1.41 being moderate, there is a moderate amount of variation in the responses.

There are enough incentives for women to actively participate in environmental sustainability initiatives (B3): The average of 4.42 implies that the respondents strongly agree that there are adequate incentives for women to actively engage in activities concerning environmental sustainability. The low SD of 0.98 indicates a narrow range of responses compared with other statements.

**Table 3.** Descriptive analysis of factors influencing Saudi women’s involvement in environmental sustainability in Riyadh

|                                              | Mean | SD   | Degree         | Order |
|----------------------------------------------|------|------|----------------|-------|
| B1                                           | 3.94 | 1.40 | Agree          | 4     |
| B2                                           | 3.69 | 1.41 | Agree          | 5     |
| B3                                           | 4.42 | 0.98 | Strongly agree | 1     |
| B4                                           | 4.31 | 1.21 | Strongly agree | 2     |
| B5                                           | 3.29 | 1.56 | Neutral        | 12    |
| B6                                           | 3.62 | 1.49 | Agree          | 6     |
| B7                                           | 3.58 | 1.56 | Agree          | 8     |
| B8                                           | 3.60 | 1.55 | Agree          | 7     |
| B9                                           | 4.27 | 1.16 | Strongly agree | 3     |
| B10                                          | 2.92 | 1.54 | Neutral        | 13    |
| B11                                          | 3.46 | 1.48 | Agree          | 10    |
| B12                                          | 3.48 | 1.61 | Agree          | 9     |
| B13                                          | 3.33 | 1.61 | Neutral        | 11    |
| Societal, cultural and technological factors | 3.69 | 0.78 | Agree          |       |

**Notes:** (N = 154); NB = B1–B13 are codes for questions  
**Source:** Author’s own work

I have been personally influenced by media portrayals of environmental issues (B4): The 4.31 mean score implies that the respondent strongly agreed with the statement that individuals are personally influenced by media portrayals of environmental problems, this is also in line with reported research by [Liu and Li \(2021\)](#). 1.21 indicates that there is some level of variation among the responses. Collaboration and networking are important in the success of environmental sustainability initiatives with female professionals and the society (B5): The mean score of 3.29 implies that respondents are ambivalent towards the impact of collaboration and networking on environmental sustainability initiatives with female professionals and society ([Howe et al., 2020](#)). The SD of 1.56 indicates a high level of variation in responses.

Societal factors hinder women's involvement in such initiatives (B6): The average score of 3.62 indicates that respondents, to some extent, agree that societal factors impede women's involvement in these initiatives ([Niyonkuru and Barrett, 2021](#)). 1.49 SD means that responses were highly variable.

The community and government can collaborate to better support women in environmental sustainability (B7): The mean score of 3.58 indicates that most of the respondents agreed that the community and government can work together to improve women's role in environmental sustainability ([Montalbo et al., 2021](#)). 1.56 SD shows that the responses have a large variation.

Cultural norms either support or discourage women from taking active roles in environmental initiatives (B8): The mean score of 3.60 is an indication that the respondents generally agree that cultural practices either promote or prohibit women from being actively involved in environmental activities. The value of 1.55 for the SD means that responses varied greatly.

The media significantly influences public awareness and attitudes towards environmental sustainability (B9): The mean score of 4.27 implies that the respondents highly agree that media considerably contribute to public perceptions and opinions about environmental sustainability ([Dehdarirad et al., 2020](#)). 1.16 suggests a moderate variation between the responses.

The public and private sectors can collaborate to promote and support women's contributions to environmental sustainability (B10): The mean score of 2.92 indicates that respondents are neither supporting nor denouncing the fact that the public and private sectors can work together to promote and support women's role in achieving environmental sustainability. The low SD of 1.54 suggests a high amount of variation in the responses.

Businesses should play a significant role in advancing environmental sustainability, particularly concerning the participation of women (B11): A mean score of 3.46 indicates that the respondents can be seen to agree that businesses should play a significant role in environmental sustainability, especially with regards to the participation of women. The SD of 1.48 indicates a high level of variability in responses.

Technology can bridge any existing gaps in women's participation in environmental sustainability (B12): The respondents generally seem to agree that technology can bridge any existing gender gaps when it comes to women's participation in environmental sustainability ([Kerras et al., 2020](#)), as the mean score is 3.48. The high SD of 1.61 means that there was large variability in the responses.

Gender norms impact women's participation in environmental sustainability (B13): The score of 3.33 indicates that respondents are neither pro nor against the idea that gender norms affect women's involvement in environmental sustainability. The interaction, with an SD of 1.61, suggests a substantial amount of variability in responses. The research highlights Saudi women's participation in environmental activities, driven by diverse incentives and media influences. While media shapes public perceptions, opinions vary on partnership synergies

and the influence of gender norms (Raman *et al.*, 2022). This underscores the complexity of factors influencing women’s engagement in sustainability, providing valuable insights into enhancing their involvement (Raman *et al.*, 2022).

Table 4 shows the Pearson correlation coefficients for the factors contributing to or inhibiting Saudi women’s participation in environmental sustainability in Riyadh, together with several other factors.

For B1, a score of 0.488 represents a moderately positive link. This implies that as the variables that augment or hinder Saudi women’s participation in environmental sustainability in Riyadh rise, there is a corresponding rise in the support of one’s community. For B2, the proper coefficient of 0.458 implies a moderately positive association. This implies that cultural elements that discourage the participation of women in such ventures are only partly related to the factors that facilitate or impede Saudi women’s contribution towards environmental sustainability in Riyadh (Abdelwahed *et al.*, 2022). For B3, this strong positive correlation coefficient of 0.902. This indicates that there is a high positive association between perceived incentives for women to engage actively in environmental sustainability initiatives and defining the moderating factors that enhance or obstruct women’s involvement in environmental sustainability in Riyadh.

For B4, a correlation coefficient of 0.371 assumes a weak positive correlation. This shows that the personal impact of media portrayals about environmental issues is positively correlated with the factors that enhance or limit Saudi women’s participation in environmental sustainability. Riyadh.

For B5, the correlation coefficient of 0.669 shows a high positive correlation. This implies that the role of collaboration and networking in the success of environmental sustainability initiatives with female professionals and society is closely related to the variables that influence or impede Saudi women’s participation in environmental sustainability (Alkhayyal *et al.*, 2019; Almaghlouth, 2022). For B6, the correlation value of 0.842 shows a strong positive relationship. This, therefore, implies that the societal dynamics that create hindrances on the part of Saudi women’s participation in such initiatives are strongly correlated with the factors that accentuate or castrate their participation in Riyadh’s environmental conservation.

**Table 4.** Correlation analysis of factors influencing Saudi women’s involvement in environmental sustainability in Riyadh

|     | B1    | B2    | B3    | B4    | B5    | B6    | B7    | B8    | B9    | B10   | B11   | B12   | B13   |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| B1  | 1.000 |       |       |       |       |       |       |       |       |       |       |       |       |
| B2  | 0.488 | 1.000 |       |       |       |       |       |       |       |       |       |       |       |
| B3  | 0.458 | 0.458 | 1.000 |       |       |       |       |       |       |       |       |       |       |
| B4  | 0.902 | 0.902 | 0.902 | 1.000 |       |       |       |       |       |       |       |       |       |
| B5  | 0.371 | 0.371 | 0.371 | 0.371 | 1.000 |       |       |       |       |       |       |       |       |
| B6  | 0.669 | 0.669 | 0.669 | 0.669 | 0.669 | 1.000 |       |       |       |       |       |       |       |
| B7  | 0.842 | 0.842 | 0.842 | 0.842 | 0.842 | 0.842 | 1.000 |       |       |       |       |       |       |
| B8  | 0.356 | 0.356 | 0.356 | 0.356 | 0.356 | 0.356 | 0.356 | 1.000 |       |       |       |       |       |
| B9  | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 | 0.236 | 1.000 |       |       |       |       |
| B10 | 0.866 | 0.866 | 0.866 | 0.866 | 0.866 | 0.866 | 0.866 | 0.866 | 0.866 | 1.000 |       |       |       |
| B11 | 0.590 | 0.590 | 0.590 | 0.590 | 0.590 | 0.590 | 0.590 | 0.590 | 0.590 | 0.590 | 1.000 |       |       |
| B12 | 0.478 | 0.478 | 0.478 | 0.478 | 0.478 | 0.478 | 0.478 | 0.478 | 0.478 | 0.478 | 0.478 | 1.000 |       |
| B13 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 0.435 | 1.000 |

**Note:** NB = B1–B13 are codes for questions  
**Source:** Author’s own work

For *B7*, a correlation coefficient with a value of 0.356 implies a moderately positive correlation. This indicates that the opportunities for community and government interaction to enhance women's participation in environmental sustainability may not be characterised by high correlations with the variables that lead to or thwart Saudi women's participation in the environmental sustainability of Riyadh. For *B8*, a weak positive correlation can be seen in the correlation coefficient around 0.236. This insinuates that the cultural norms that either encourage or discourage women from engaging in proactive roles pertaining to environmental initiatives are weakly associated with the factors that amplify or suppress Saudi women's contribution towards environmental sustainability in Riyadh. For *B9*, 0.866 is a correlation coefficient that implies a strong positive relationship. The media's influence on public awareness and perceptions of environmental sustainability has a strong correlation with the factors that augment or impede Saudi females' participation in environmental sustainability in Riyadh.

For *B10*, the linear correlation coefficient of 0.590 shows a positive, moderate correlation. This indicates that the strength of the relationship between the public and private sectors to achieve joint ventures in women's participation in environmental sustainability is slightly correlated with the elements that facilitate or prohibit the implementation of Saudi women's involvement in environmental sustainability in Riyadh. For *B11*, the positive relationship holds a moderate correlation coefficient of 0.478. It means that the activity of businesses in enhancing environmental sustainability, particularly in terms of women's engagement and involvement, with regard to Saudi women's participation in Riyadh, is moderately related to the factors responsible for the sustenance or blockage of Saudi women's involvement in environmental sustainability in the city. For *B12*, a weak positive correlation is presented with a value of the correlation coefficient equal to 0.43. This implies that the role of technology in filling out any vacuums in women's participation in environmental sustainability is moderately associated with the factors that stimulate or undermine Saudi women's engagement in environmental sustainability in Riyadh. For *B13*, the correlation coefficient of 0.578 shows a low positive correlation. This implies that the gender stereotype of women's involvement in environmental sustainability partially correlates with the variables that improve or deter Saudi women's participation in environmental sustainability in Riyadh.

#### *Policy and collaborative influences*

The findings from [Table 5](#) indicate unanimous agreement among participants on all statements, reflecting widespread consensus. However, diverse experiences and opinions within this consensus underscore the complexity of their viewpoints. Participants particularly emphasise the importance of policy changes to enhance women's roles in advancing environmental sustainability initiatives.

In assessing the perspectives on policy changes and women's roles in environmental sustainability, the findings reveal varying degrees of agreement and divergence. Participants generally advocate for policy changes to better support women's contributions to environmental sustainability (*C1*, mean = 3.86, *SD* = 1.48). There is also recognition that current policies impact their ability to contribute effectively (*C2*, mean = 3.51, *SD* = 1.53). Respondents acknowledge a need for improved collaboration among women in this field (*C3*, mean = 3.52, *SD* = 1.48), while they believe Saudi women influence environmental awareness in younger generations (*C4*, mean = 3.62, *SD* = 1.50). The variability in responses highlights the complexity of evaluating policy effectiveness in empowering women in environmental sustainability, reflecting diverse perspectives and experiences among participants.

**Table 5.** Descriptive analysis of policies and collaborative efforts impacting Saudi women’s participation in environmental sustainability

|                                     | Mean | SD   | Degree | Order |
|-------------------------------------|------|------|--------|-------|
| C1                                  | 3.86 | 1.48 | Agree  | 1     |
| C2                                  | 3.51 | 1.53 |        | 4     |
| C3                                  | 3.52 | 1.48 |        | 3     |
| C4                                  | 3.62 | 1.50 |        | 2     |
| Policy and collaborative influences | 3.62 | 1.13 |        |       |

**Notes:** (N = 154); NB = C1–C4 are codes for questions  
**Source:** Author’s own work

Table 6 provides Pearson correlation coefficients between factors influencing Saudi women’s ability to contribute to environmental sustainability and other factors.

The study highlights varying strengths of relationships between factors influencing Saudi women’s involvement in environmental sustainability and related variables. For C1, a very strong positive correlation (0.934) suggests that increasing factors supporting women’s participation necessitates policy changes to enhance their contribution (Khan, 2022). C2 shows a weak positive correlation (0.241), indicating minimal impact of policies on women’s contributions. C3 reveals a very strong positive relationship (0.926) between factors influencing women’s participation and collaborative efforts. Similarly, C4 indicates a strong positive correlation (0.926) between women’s influence on younger generations’ environmental consciousness and their participation factors. The statistical significance of these correlations underscores the complexity of the factors affecting Saudi women’s engagement in environmental sustainability, warranting further research into these intricate relationships.

*Impacts on Saudi women’s participation in environmental sustainability in Riyadh*

The respondents, in general, view the role that Saudi women hold in environmental sustainability practices in a favourable light with a mean score of 3.77. With SD at 0.86, it then concludes that there is a moderate level of agreement among the participants. The “Agree” degree additionally shows that there is a general agreement as to the perception that Saudi women have in environmental sustainability in Riyadh. Like the perception, most of the participants agree (with a mean score of 3.69) in factors triggering Saudi women’s enrollment in environmental sustainability. Aside from the fact that the mean and the SD are

**Table 6.** Correlation analysis of policies and collaborative efforts impacting Saudi women’s participation in environmental sustainability

|    | C1    | C2    | C3    | C4    |
|----|-------|-------|-------|-------|
| C1 | 1.000 |       |       |       |
| C2 | 0.934 | 1.000 |       |       |
| C3 | 0.926 | 0.241 | 1.000 |       |
| C4 | 0.926 | 0.241 | 0.926 | 1.000 |

**Note:** NB = C1–C4 are codes for questions  
**Source:** Author’s own work

a little lower, the first result indicates a narrower consensus. But the “agree” degree level proves that factors determining Saudi women’s involvement in environmental sustainability are still dominated by a positive attitude. The mean score of participants reflecting their agreement with the impact of local and national policies on Saudi women’s capacity to pursue environmental sustainability is 3.62. A larger SD (1.13) indicates a broader latitude of opinions relative to the previous findings. The “Agree” score shows that there may be some differences in opinions regarding the impact of policies on Saudi women’s role in environmental sustainability.

The results of the descriptive statistics as shown in Table 7 indicate a positive perception and agreement of participants towards the current position of Saudi women in environmental sustainability in Riyadh, the determinants that lead to their participation and the result of the policies on their participation.

Understanding the nuances of the involvement of Saudi women in environmental sustainability is necessary to support complete and effective initiatives. Table 8 provides the Pearson correlation coefficients and significances; the coefficients and their corresponding significances help to understand how the late women in Saudi Arabia speak to their contemporary roles and roles that influence the participation of women and how the local and national policies influence the involvement of women.

A correlation coefficient of 0.935 indicates a very high positive relationship, showing that higher levels of Saudi women’s involvement in developing environmental sustainability in Riyadh correspond to greater current involvement and positive perceptions of their role. A correlation coefficient of 0.908 signifies a strong positive relationship, indicating that factors affecting Saudi women’s participation in environmental sustainability are closely tied to their

**Table 7.** Descriptive analysis of factors impacting Saudi women’s role in environmental sustainability

|                                                                                                          | Mean | SD   | Degree | Order |
|----------------------------------------------------------------------------------------------------------|------|------|--------|-------|
| Perception and role                                                                                      | 3.77 | 0.86 | Agree  | 1     |
| Societal, cultural and technological factors                                                             | 3.69 | 0.78 |        | 2     |
| Policy and collaborative influences                                                                      | 3.62 | 1.13 |        | 3     |
| The role of Saudi women in developing environmental sustainability: a case study of Riyadh, Saudi Arabia | 3.69 | 0.86 |        |       |

**Source:** Author’s own work

**Table 8.** Correlation analysis of factors impacting Saudi women’s role in environmental sustainability

| Themes                                                                                                                                                             | Pearson correlation | Sig. (2-tailed) |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------|
| The current role of Saudi women in environmental sustainability activities in Riyadh and how do they perceive their involvement                                    | 0.935               | 0.000           |
| The factors that enhance or inhibit Saudi women’s involvement in environmental sustainability in Riyadh                                                            | 0.908               | 0.000           |
| Local and national policies affect Saudi women’s ability to participate in environment sustainability and what policy changes could better encourage their efforts | 0.947               | 0.00            |

**Source:** Author’s own work

roles in promoting it. A high correlation coefficient of 0.947 suggests a very strong positive relationship, implying that local and national policies significantly influence Saudi women's capacity to engage in environmental sustainability, highlighting the need for policy changes to support their efforts.

### Conclusions

This study explores the perceptions of environmental sustainability among women aged 28 to 48 in Riyadh, Saudi Arabia, with a predominant focus on teachers. The participants are highly educated, with 76.0% holding a bachelor's degree and 22.0% possessing a master's or doctorate, suggesting a strong foundation for understanding sustainability. However, the study notes the limited representation of women with only diplomas (1.9%), highlighting a lack of diverse professional perspectives. Surveys and correlation analysis were used to examine the attitudes and perceptions of Saudi women towards environmental sustainability. The cultural context was a significant variable, aiming to understand individual experiences, particularly in relation to instilling environmental responsibility in future generations. The findings reveal a complex spectrum of attitudes among Saudi women towards environmental sustainability. There are strong correlations between active engagement, personal challenges, commitment to future generations and the perceived need for enhanced environmental education. While participants generally agree on the value of incentives and the impact of media, opinions differ on the roles of various sectors, with notable indifference towards cooperation. The study underscores the necessity of reforming existing policies to enhance women's contributions to environmental sustainability. Despite a general agreement on this need, the diversity of experiences and opinions among participants highlights the complexity of their perspectives. The correlation analysis supports these findings, suggesting that policy changes should consider the various influencing factors to be effective. Tailored approaches are necessary to address specific challenges and behavioural patterns. One limitation of this study is the limited representation of women with diverse educational backgrounds, particularly those with only diplomas. This lack of diversity may have constrained the range of perspectives captured in the research. Future research should aim to include a more diverse participant base in terms of education and occupation. This broader approach will provide a more comprehensive understanding of the dynamics of environmental sustainability among Saudi women. Policymakers should leverage these insights to better support women's active participation in environmental sustainability initiatives.

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#### Further reading

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