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INTEGRATING GENDER IN ENERGY: A CASE STUDY OF PAKISTAN WATER AND POWER DEVELOPMENT AUTHORITY (WAPDA)

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Abstract: Energy policies are often viewed as gender neutral, whereas policy decisions have far-reaching consequences and implications for women's economic empowerment and equality between men and women. The detrimental consequence of having a gender-neutral policy is that the energy sector inadvertently discriminates against women's integration in energy sector and their particular needs and expertise. In Pakistan, women constitute only 4 percent of the total energy workforce. The aim of the study was to present a case study on Pakistan Water and Power Development Authority (WAPDA), the leading institution of energy in Pakistan in relation to integration of women in energy policy. For this purpose, primary data was collected through an online survey designed specifically for employees of WAPDA. The responses were enriched through conducting interviews of key female informants at WAPDA in leadership positions. The analysis technique used to gauge the level of gender-mainstreaming in WAPDA was through thematic analysis of identifying themes in interviews and statistical analysis of online responses. The findings highlighted almost 70 percent fewer women were employed in energy sector. Further issues in relation to retention of women, leadership and advancement were discussed to understand systemic obstacles for joining the energy sector. This study has implications for designing a gender-responsive energy framework that aims to integrate differential socio-cultural requirements, needs and priorities of women and men in order to overcome gender biases that hinder actions based on equality.



INTRODUCTION

A sustainable energy transition is emerging and projected to increase from a current 11 to almost 42 million employees by 2050. In order for this energy transition to happen and meet its sustainable energy requirements and three-fold objectives underpinning SDG 7. The society will need to harness talent in all forms through gender diversity in energy sector. In addition to changing energy systems – this global transition offers a chance for a deeper socio-cultural transition; towards an inclusive workforce and to societies that leave no one behind. There is evidence that shows broad participation of women in energy sector will lead to a successful clean energy transition (ENERGYA, UN Women, & World Bank, 2018). In terms of employment, the energy sector remains the most gender- imbalanced sector globally and within South Asia in particular. Women employees represent only 3 to 16 percent of the energy sector staff, this proportion is even lower for female engineers and technical staff where it is

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less than 1 to 6 percent. This study analyzed the integration of women in the energy sector of Pakistan. Emphasis is on to study female participation in the energy sector in relation to Water & Power Development Authority (WAPDA); a government-owned public utility maintaining power and water in Pakistan. According to World Bank's South Asia Gender and Energy Facility (2019), WAPDA has recently collaborated with WePOWER, South Asia Women in Power Sector Professional Network, this initiative encourages female participation in technical roles in the energy sector.

For the purpose of this study 'gender' will be used a socially constructed system, that defines socially acceptable roles, privileges, attitudes and relationships between men and women, which are embedded in the socio-cultural fabric of the society and not biologically determined (Cecelski, E., 2011).

LITERATURE REVIEW

Gender Mainstreaming & Energy

Gender mainstreaming in global energy policy has been widely highlighted as a process that assess the implications of planned actions, programs and policies on men and women at all levels. The aim is to ensure that policy decisions take into consideration the differential interests and requirements of men and women and take into account cultural barriers and challenges faced by both genders alike. According to Global Women's Network for the Energy Transition (2020), participatory approach is encouraged that aims to tackle energy issues through the contribution and involvement of all stakeholders, both men and women collectively.

Another research revealed that higher number of female workers are positively correlated with a meaningful work culture that results in higher profitability and increasing levels of employee retention, the study concludes the need to provide equal opportunity to women to advance at every step of their professional development. Women in Energy Association (2018), there is growing evidence that suggests higher gender diversity in energy sector in leadership and board positions improves innovative capacity in conjunction to financial benefits.

Global Female Participation in Energy

Globally, women remain marginalized from decision-making processes in relation to the energy sector. Empirical studies on developed countries revealed that the share of female employees in energy-based industries is still 20 percent, they tend to take more administrative and public relations roles. The results revealed that women occupy 7 percent of energy ministerial posts. The World Bank (2020) report concludes that enrollment in STEM fields is lower for women, hence they lack necessary skills required for technical roles in the energy sector, leading to an inadvertent male bias.

To understand the level of gender mainstreaming in energy policies, a national assessment was undertaken of 192 energy plans and strategies from 137 developed and developing countries (Prebble, M., & Rojas, A., 2018). The study aimed to capture how often gender equality and women's economic participation is contextualized in energy frameworks. The results revealed 68 percent of the frameworks did not include any gender related mentions in their national energy policies. Furthermore, from 192 documents reviewed only two categorized women as 'agents of change', recognizing their potential to drive policy decisions in energy-based activities, whereas the highest category viewed women as either beneficiaries (17 percent) or as vulnerable groups (5 percent).

The World Bank Group Gender strategy conducted an in-depth study on employment in the energy sector. The main aim was to understand female economic participation and design interventions to monitor impacts in energy institutions. The survey covered countries in sub-Saharan Africa and south Asia. The total combined staff footprint that was surveyed was 92,727 people of whom 56 percent are in Pakistan. The findings revealed that women on average constituted 21 percent of the power workforce in energy utilities, whereas in Pakistan the figure was as low as 4 percent. Majority of female employees constitute of junior, non-supervisory positions in the energy sector; 25 percent of women constituted managerial positions in three African countries in contrast to Pakistan where women in senior and executive roles was 2 and 4 percent respectively. The underlying reasons for lower rates of female staff was due to lack of support in terms of flexible working hours and traditional gender roles where women had to bear the responsibility of child-care.

Moving across continents, the situation in Pakistan is even lower at 4.6 percent among technical workforce. Maldives had the lowest regional representation of technical women (0.24) percent in contrast to Bhutan (16.5) and Sri Lanka (15) percent. The plethora of reasons presented in survey showed a range of factors that perpetuated gender inequality in the power-sector. In Bangladesh and Nepal, female staff cannot participate in field trainings due to lack of suitable quarters for females. Lack of facilities at sites such as separate lodges, toilets and food facilities were a major deterrent (Berthaud, A. et al., 2004).

Challenges for Females in Energy

While there is considerable momentum on improving the integration of women in energy globally, it appears that potential gains are not fully realized owing to the nature of persistent barriers that women are challenged with in the energy sector. According to International Renewable Energy Agency (2019), one of the main reasons is lack of women in technical fields, this limits the role of women in the retail segment of the value chain and hinders participation and involvement in technological areas and use of equipment. This explains the overrepresentation of women in administrative position, in energy ministries, whereas men are overrepresented in technical and managerial roles. Hence, it is crucial to develop a national regulatory framework, that encompasses clear understanding of gender and social responsibility-based policies and need for gender awareness.

A recent report by United Nations Industrial Development Organization (2014) conducted a survey to understand possible reasons for lower female participation in energy sector based on working conditions, policy practices and leadership and advancement of women in higher roles. The results of the survey revealed that while total female participation is at 28 percent this figure significantly drops to 17 percent at board membership positions. The findings revealed women's interest and passion to work in energy sector was as promising as male counterparts, yet they lacked adequate support to achieve their professional goals. Furthermore, women role models did not exist for aspiring women as 40 out of 232 people claimed to have no females in leadership roles. Interviews, revealed that energy sector still embodies the culture of having a 'male centric' environment. Whereas 68 percent of the respondents claimed lack of technical experience and qualifications posed a major barrier for women.

Gender & Energy Policy – Pakistan

The focus on gender concerns and need for greater diversity has been a fairly strong agenda for the Government of Pakistan. In terms of the policy-making process, this has often been reflected in Five-year plans that highlight the need for greater gender diversity for women in economic participation. Historically since 1947 until 1971, most government policies were gender neutral and women were often categorized as a vulnerable segment of the society that required focus on social welfare schemes. The 1973 constitution, under article 32 stipulated that; *'there shall be no discrimination on the basis of sex alone'*.

Under the 18th Constitutional Amendment, a gender and energy strategy was designed to streamline gender considerations and empower women in energy departments, provincially. The strategic goals, highlighted the need to increase representation in decision-making and leadership positions in the Department of Energy, Punjab by 15 percent job quota allocation. Other policies included age relaxation; up to 38 years for women and equal wages for work of equal value.

A report Rural Support Programs Network (2011) analyzed gender mainstreaming in the Pakistan Domestic Biogas Program (PDBP) from 2009 to 2011 and revealed that higher turnover of female staff, meant that involvement in project planning phase was limited, whereas the ratio of women to men in technical department was 1 to 5. A total of two female employees were seen as program officers, in contrast to 20 men. The underlying reasons for why female participation was low, was a lack of conducive working conditions designed for female workers. No woman was seen as adapting a supervisor role as lack of mobility in other areas and socio-cultural reasons raised concerns for women who were interested in working as project supervisors or activists. The report highlighted the need for capacity building of the PDBP staff regarding gender diversity across the project cycle.

A data-driven analytical gender case-study that aimed at measuring the impact of gender diversity on technical and financial performance in South Asian energy sector was piloted with K-Electric, that supplies power to an importance economic hub and a populous city in Pakistan; Karachi. KE, has been committed in improving diversity and inclusion as part of its policy since 2016. This inculcates the need to have a more diverse workforce, an enhanced focus on women's retention and empowerment and an embedded culture that demonstrates the importance of diversity at workplace. The employee database showed a commitment towards higher number of females from 3.42 percent in 2019 to 3.5 percent in 2020. Women are mostly given enabling roles, whereas technical areas such as distribution, generation and transmission is largely catered by male workforce, accounting for 4.6 and 3.2 percent of the female workforce respectively.

According to World Bank's South Asia Gender and Energy Facility (2019), a successful implementation could be seen in under the case-study of WAPDA's collaborative efforts under the WePOWER agenda to strengthen female participation in energy. WAPDA conducts orientation sessions of almost 500 female students to educate them on career growth and opportunities in the STEM field. Furthermore, female role-models conduct ted-talks to deliver inspiration to females that aim to break glass-ceilings in the energy sector. Moreover, certified internships are offered to aspiring female students and seminars are held in engineering universities.

A recent baseline assessment performed by Energy Sector Management Assistance Program (2020) for eight South Asian regions, revealed the underrepresentation of women in power sector and engineering programs as complex and multi-dimensional phenomena. The results revealed, that while all countries, including Pakistan have clear policy goals to improve female participation in energy sector, the policy does not specify the need to promote more women in STEM or technical educational fields. Furthermore, maternity benefits and leaves vary across each country; in Pakistan maternity leave is granted for 3 months, whereas Bangladesh, Bhutan and India offer 6 months of paid maternity leave for women (Berthaud, A. et al., 2004).

While a dearth of studies exist that stress the need to improve women's economic participation in energy projects, no systematic studies are conducted that are disaggregated by gender, position or salary. There is limited gender-disaggregated data in relation to employment in the energy sector.

This study will aim to contribute to the sparse literature conducted in Pakistan, in relation to integrating women in energy. It can help gauge our understanding of how normative change can be inculcated in the leading public organization; WAPDA. The evidence-based approach will be a way forward in filling the gap for disaggregated data in the energy sector.

Aims and Objectives

This study examines how well women are currently integrated into the energy sector, by focusing on WAPDA. It further aims to understand the obstacles that women encounter in relation to their employment at WAPDA. Thirdly, it aims to develop recommendations based on existing experiences of female employees and emerging best practices to promote the integration of women in terms of participation at par with men at this organization. This study advocates the need to not only focus on diversifying our energy mix but also create an opportunity for diversifying energy work-force in Pakistan's leading – WAPDA.

The objectives of the current assessment include a detailed examination of the following areas:

- How female participation is being currently integrated at WAPDA; what obstacles hinder career progression and retention
- Based on evidence from baseline survey and interviews what recommendations can be drawn, including best practices to promote women's participation at par with men in energy sector.

METHODOLOGY

For the purpose of this study primary data has been collected from WAPDA employees. A close-ended questionnaire was designed for the first part of the study. The questionnaire was divided into three sections;

- 1) **Retention:** this section aimed to understand level of female retention at WAPDA based on obstacles that hinder career progression.
- 2) **Leadership and Advancement:** this section aims to capture responses to understand whether gender equality in the senior positions exist at WAPDA and whether females in decision-making exist in energy policy
- 3) **Polices for Institutional Change:** this section captures the effectiveness and existence of current policies and programs at WAPDA that either encourage or retain more women.

The second stage of the study entails key informant interviews with three leading female's at WAPDA. Key themes were identified through a thematic analysis technique. Each interview was transcribed verbatim and reiterated and coded independently based on categories.

Sampling Frame

To understand the manner in which WAPDA ensures gender-responsive policies are being implemented, this research was conducted on a total of forty-four engineers employed at WAPDA. About 27.3 percent of respondents were females, whereas the rest of the respondents were males owing to the gender imbalance in the energy sector (see Figure 1).

The sample was disaggregated by marital status, basic pay scale level and role classification. Majority of the respondents belonged to the junior executive/engineer role (63.6 percent) in the hydel project (see Figure 2).

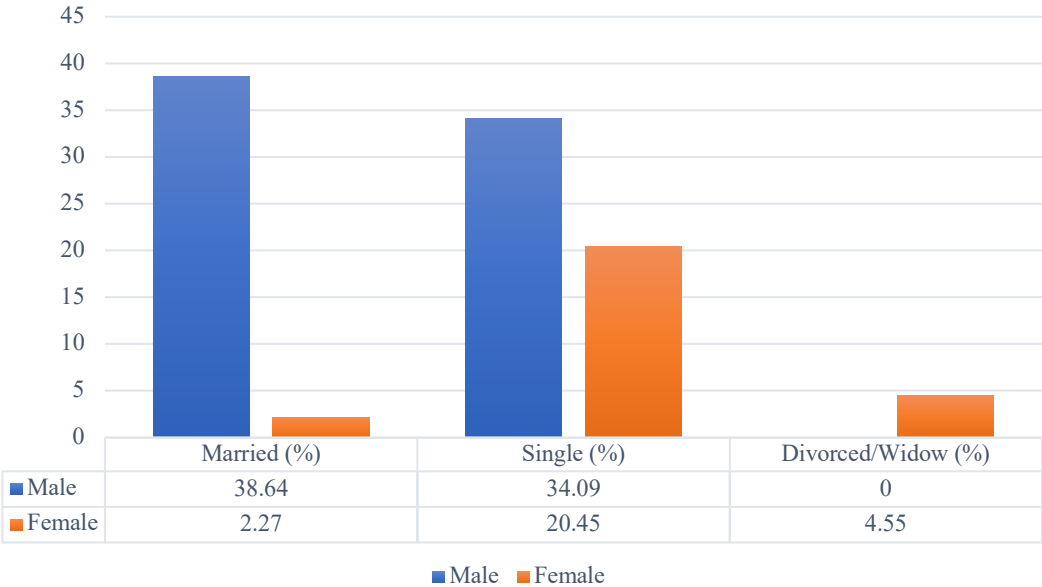


Figure 1: Marital status (by gender)

It is crucial to note that this study is not intended to be a representative sample of the entire energy sector. Rather, it is an investigation focused on WAPDA as a case study. The analysis is guided through literature and discussion with colleagues willing to share their experience as females working for a public organization.

Nonetheless, the data collected makes a valuable contribution for the integration of women in energy sector by offering specific insights and challenges faced.

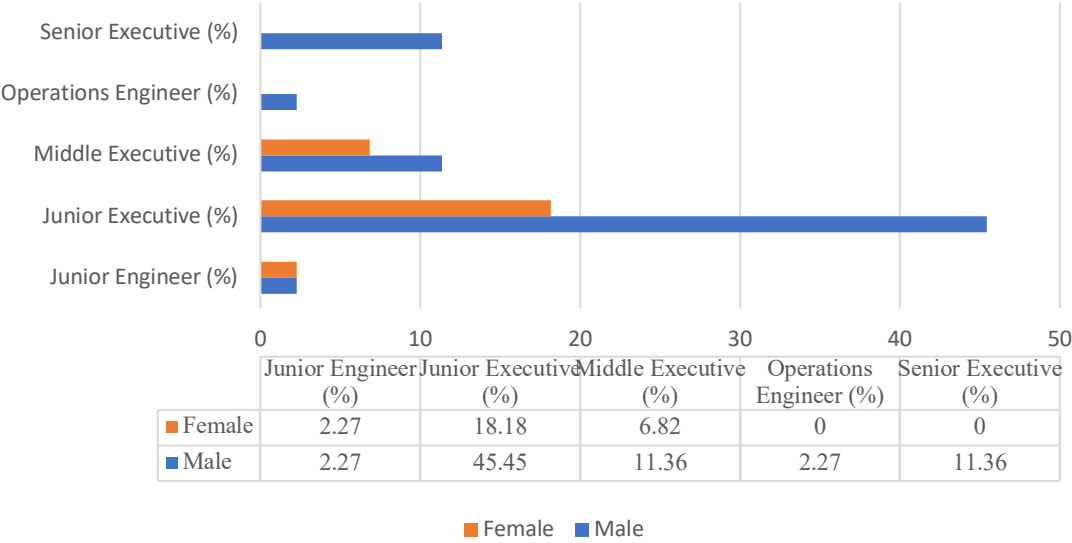


Figure 2: Role classification in Mangla and Tarbela hydel power projects

RESULTS

This section will aim to present an analysis of the survey conducted online. This survey was specifically designed for engineers involved in two main hydel-power projects; Mangla and Tarbela. Given the lack of publicly available sex-disaggregated information of employees at WAPDA, this analysis will help understand perceptions on integration of women in energy.

As presented graphically below in figure (3), the most decisive factor was challenging opportunity (63.6%) and long-term job security (38.6%). However, the survey responses were further disaggregated based on gender and differences emerged. Women considered training and development (13.6%) as the top first reason for joining the energy sector, whereas men considered challenging opportunity (52.3%) as a crucial reason which was the second defining factor for women (11.4%).

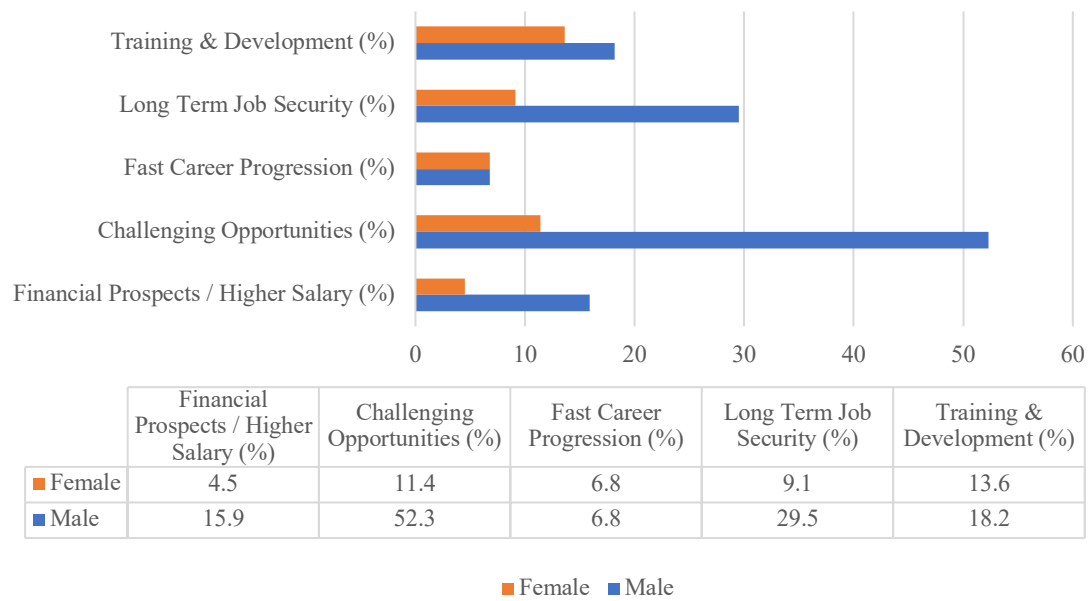


Figure 3: Reasons why respondents chosen to work in the energy sector

A further disaggregated revealed that perceptions in regard to obstacles faced by women in energy sector differ across males and females. While men considered a lack of technical experience (27.3%) as the main impediment for progress, only 2.3% of the females reiterated this particular stance. For women, lack of encouragement from senior leaders (11.4%) and lack of endorsement (9.1%) emerged as potential obstacles that could hinder their progress.

Leadership and Advancement

Based on overall responses from the survey, there is consensus on the under-representation of women in the energy sector, 65.9 percent of respondents agreed that there was under-representation of women in higher roles; Gender ratios vary across positions, at top leadership positions women board members are non-existent. 86.4 percent of the respondents claimed to have no female-led leaders for projects.

The underlying reasons for low representation of women were then interpreted in light of the responses received. The cumulative highest reason for why women are under-represented in leadership roles was that women tend to leave careers mid-way (55.8%). The second top reason was lack of qualified women in the energy sector (41.9%), followed by lack of same level of support as male employees (30.2%). However, sex-disaggregation of results revealed that women believed that lack of same level of help or support as male colleagues (16%) prevented representation in higher roles. The second factor selected by female respondents was lack of qualified women to

serve in higher positions (11.4%). Contrasting evidence showed that 50 % men attributed under-representation in higher roles to the possibility of women leaving their careers mid-way. The graphical representation in figure below shows role of other reasons in regard to promotion, lack of confidence and gender requirements for pool of promotion.

Findings also revealed that women constituted only 4.5 percent of 18 scale rank in contrast to 18.2 percent men. Higher number of women came under the category of 17 scale officer category (22.7) percent however this figure was lower than men who constituted 50 percent of 17 scale jobs.

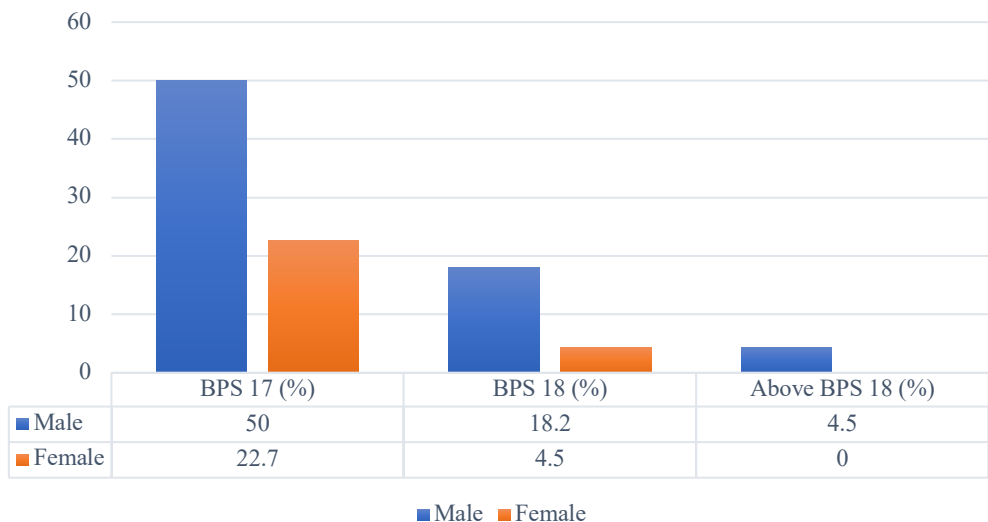


Figure 4: Basic pay level (by gender)

Policies for Institutional Change

This sub-section will provide a detailed overview of existing policies at WAPDA that are crucial in overcoming gender inequality at workplace and issues specific to women.

While, results revealed that equal opportunity and pay exists at WAPDA. This reveals that salaries are based on salary structures that do not discriminate by gender and are based on equal qualifications and work experiences. This however can perpetuate pre-existing inequality of opportunities as women often take breaks in career for child-birth or child-care obligations. This leads to a gender pay gap in absolute terms, due to higher concentration of women in junior positions, hence women have weaker negotiating abilities once they return to work.

Thematic Analysis

In order to gauge an in-depth understanding of the challenges and roles of women currently employed at WAPDA, three key interviews were conducted with women in leadership positions; a gender specialist (grade 19), a civil engineer (grade 19) and a deputy director (grade 18). The four key themes that emerged from the responses based on integration of women in energy policy and in relation to WAPDA will now be discussed in detail.

Lack of Female Representation and Role Models

A recurring theme in all three interviews were lack of female representation and role-models during the start of their career. These challenges reiterated a similar stance on the lack of female representation when these women initially joined WAPDA. The average career span for the women interviewed was 14 to 17 years, hence responses showed that female representation was not only low but none existence in some roles initially. As echoed in response to the question on their earlier role and challenges faced at the organization;

‘I think I paved the way for females at WAPDA, because when I joined in 1991, there were only two female candidates in my batch’ – Deputy Director (grade 18)

'I am among the senior most five engineers at WAPDA, before me there were only two female engineers and I had to face a lot of criticism'

The underlying reason often displayed in responses to challenges faced was the fact that since no female employee before had ventured in certain roles such as coordination cell, and thus this led to a narrowed and limited understanding of the areas where women could work as reiterated in this shared experience.

On-Site Female Participation and Field Visits

As revealed in our survey, women tend to self-select out of these field visits to dam sites. This reflects women's own self-perceptions about their competence in technical occupations in energy sector.

'Females don't like to go to field areas or such challenging environments themselves because they think the environment is difficult and they will have difficulty in adjusting, if they have families, their kids will suffer' – Deputy Director (grade 18);

However, all women interviewed agreed that field visits to construction sites was impertinent for their career advancement. *'People will not allow their daughters to move to near city sites because there are not enough females working on site. It is not only societal pressures but lack of females on site as well' – Civil Engineer (grade 19).*

Lack of Social Acceptance and Social Skill Development

A cross-cutting theme among the interviews conducted was a lack of social acceptance towards women in energy sector and the need to focus on social skill development for male employees. This highlighted a gender-divide in accepting the role of women in an originally male-dominated sector.

During my official dinners I am standing alone and no one comes and talks to me as other people will judge. Even my male colleagues do not carry forward discussions on political or policy matters. 'Institutions don't give confidence. Most male engineers are not social' – Civil Engineer (grade 19)

Existing Policies & Facilities

Policies and facilities at WAPDA are mandated by the Federal government and are implemented. This theme focused on gender-responsive policies at WAPDA, while all respondents highlighted that there was no form of gender inequality perpetuated at WAPDA, this showed that recruitment policies were based on equal opportunities and merit rather than gender differences. Respondents highlighted how the workplace environment has evolved from when they first joined. This shows adaptability and dynamic shift in policies and facilities at WAPDA.

'There was no set salary or promotion policies to guide on pay raise or promotion and set such criteria was established for this new role of land acquisition and resettlement and now it is a permanent job' – Member of Anti-harassment wing & Gender Specialist (grade 19).

CONCLUSION

This report captures the major barriers that affect integration of women in energy sector of Pakistan, particularly at WAPDA. In agreement with existing evidence, the energy sector remains a male-dominant sector with persisting gender stereotypes, resulting in a lack of female role-models. This report can act as a baseline assessment for energy-based organizations to develop gender-specific interventions that will help develop inclusive work environments. Hence, a green economy for Pakistan should ensure that 'No one is left behind' in commitment to Agenda 2030.

Based on findings from the survey and interviews conducted, following policy recommendations have been drawn. An overarching recommendation for all stakeholders is to ensure that they conduct an internal analysis to identify existing barriers and enablers to ensure workplace environments encourage gender diversity and inclusivity.

Strengthening STEM-based fields: It is crucial for networks such as WePOWER and WIE to make a systematic effort to encourage engineering students to engage in power sector by offering field-visits and internships with energy sectors.

Greater Awareness & Visibility: A knowledge hub and repository of data for research and outreach can ensure that representation of females and barriers become visible to the public sphere

Mapping Energy Policies: The lack of sex-disaggregated data makes it difficult to measure the extent at which gender objectives are being met through current energy policies. Further research through collaboration can help understand the degree to which gender-responsive policies are being translated into action.

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