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## Gender And Nuclear Security: Assessing Women's Participation In Strategic Security Institutions In Pakistan

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### Abstract

*In this study, I explore the linkages between gender inclusion and nuclear security governance in Pakistan through the lens of women's engagement in strategic security institutions. Yet, despite the growing global awareness of how women are present in diverse roles within the security sectors, women's participation in nuclear policy-making and strategic planning and in decision-making institutions in the defense sector is still limited. This imbalance calls into question issues of inclusion, the effectiveness of policy and holistic security governance. The issue being studied in this paper is lack of representation of women in strategic security institutions, which can impact the complexity and range of views in the policy-making process and in risk assessment frameworks for nuclear security. The study builds on feminist frameworks of security and institutional inclusivity, focusing on security governance and the roles of gendered structures. The design used was a mixed-method research design, including two types of methods: the qualitative type, which included interviews with policymakers, and the quantitative type, which involved an institutional representation analysis of the gender dimension. The findings were confirmed by content analysis of policy documents. Primary data were gathered from official documents of the defence-oriented institutions and from records of public service commission as well as semi-structured interviews with the security professionals in Pakistan (n = 25). The results show that only less than 12% of the personnel are women in strategic security institutions and hardly any are working in nuclear policy advisory positions. Institutional constraints, socio-cultural norms and restricted professional access to defense sectors are some of the major hindrances. Derived from these findings, measurable outcomes are proposed that include a target of 20% for women in strategic security roles within five years as well as recommendations to ensure a more gender-responsive approach to recruitment and to institute structured capacity-building initiatives to increase opportunities for women to participate and lead in strategic security positions.*

**Keywords:** Gender inclusion, nuclear security, Pakistan, feminist security theory, strategic institutions, policy governance

### 1. Introduction

Nuclear security governance is among the most complex and sensitive areas of contemporary statecraft, and calls for specialist knowledge, institutional coordination, and policy foresight. The nuclear security architecture has developed in Pakistan in a centralized command and control structure with a highly technical and hierarchical decision making process and an atmosphere of high confidentiality. These characteristics are necessary for strategic deterrence and state security, but can give rise to institutional cultures that are not inclusive, including in gender representation.

According to research in Europe, the more diverse an institution's gender mix, the better the quality of decision-making, risk assessment, and resilience to good governance. Research in Europe indicates that the more gender diverse an institution, the better the quality of decision-making, risk assessment and resilience to good governance. Hudson et al. (2012) contend that, in the context of conflict prevention and strategic stability, gender-balanced security institutions are more effective because they have more cognitive diversity in formulating policies. However, these are not yet fully incorporated into the processes of nuclear governance, particularly in developing countries such as Pakistan, where strategic security institutions are still largely dominated by traditional military norms and roles expectations.

Women in Pakistan have come a long way in higher education, especially in international relations, defense studies, Physics, and Engineering etc. Investment in these strategic nuclear institutions is still unbalanced regarding them, in spite of this educational improvement. This means that the barrier is not the student's academic qualification, but is structural exclusion, built into institutional structures. Feminist security theorists point to historical frameworks of gender that link authority, rationality, and technical expertise with masculinity as a basis for inclusion (Tickner 2001).

Further, nuclear governance systems are subject to confidentiality rules, something that is essential for national security, but can inadvertently strengthen closed institutional networks. Such networks are frequently built on non-formal channels of recruitment, seniority and trust and credibility defined within the network. These are mechanisms that may have disproportionately negative effects on women, in a context where professional networks are still male dominated. As previously noted, security professions tend to be dominated by men and highly technical, which can restrict access to strategic decision-making for non-dominant groups as Cohn (2013) points out.

Within Pakistan's strategic context, policy making on Nuclear issues is intertwined with Defense institutions, Scientific research institutions, and the institutions of National security. They form the basis for deterrence policies, manage strategic risks and comply with international nuclear standards. Women, however, continue to be poorly represented in these institutions, and over-represented in positions of leadership, advisory and policy making are women.

This gender disparity is a concern in terms of governance. If women are not involved in decision making on nuclear security, they are missing out on the range of views necessary to a comprehensive risk analysis. This can constrain institutional capacities to respond to new security threats like cyber threats to nuclear facilities, regional geopolitical security risks, and new non-traditional security threats. Feminist academics have developed the concept of "epistemic blindness," a lack of which results from the absence of women in security governance, is the result of neglecting critical social, ethical, and human aspects of security (Enloe 2014).

Moreover, the international security landscape is increasingly becoming sensitive of the importance of inclusive governance structures. Gender equality in peace and security processes is a focus of the United Nations and other international organizations, as seen in UN Security Council Resolution 1325 which mandates more women's participation in decision-making roles in peace and security processes (UNDP 2022). Nuclear security is not always defined explicitly in gender instruments, but it is nonetheless a relevant consideration due to its strategic value.

Pakistan's institutional reform in the defense and security industry has slowly opened doors for women, creating an opportunity to fill positions in administrative and technical jobs. The shift from grassroots involvement to decision making at the strategic level is still

minor. This indicates that although formal policies of inclusion might be in place, informal institutional practices still contribute to gender gaps.

### **Research Gap**

Although the field of gender and security studies has gained momentum and increased in literature, there is a lack of empirical research specifically on women's involvement in nuclear security governance. Research so far focuses largely on women in peacekeeping, military recruitment or in the broader public sector, and neglects strategic nuclear institutions.

Also, there is little research that examines the interplay between institutional opacity, command structures and technical specialism vis-à-vis gender exclusion in nuclear governance. Lack of Pakistan specific empirical information about the female representation in nuclear policy making institutions, advisory councils and strategic planning institutions is also the issue. Moreover, prior literature does not often look into women leaders' career growth or career hurdles to leadership positions in high-security sectors.

The present study seeks to fill these voids by presenting empirical data on representation levels, institutional barriers and experiences of the women involved in or associated with strategic nuclear institutions in Pakistan.

### **Research Objectives**

1. To assess the current level of women's participation in Pakistan's strategic nuclear security institutions across technical, administrative, and policy-making roles.
2. To identify structural, institutional, and socio-cultural barriers limiting women's entry and progression in nuclear security governance.
3. To analyze the impact of gender underrepresentation on decision-making processes in nuclear policy and strategic planning.
4. To evaluate existing institutional policies and frameworks regarding gender inclusion in Pakistan's security sector.
5. To propose evidence-based reforms for improving gender balance in nuclear security institutions.

### **Research Questions**

1. What is the current proportion of women employed in Pakistan's strategic nuclear security institutions?
2. What institutional and socio-cultural factors restrict women's participation in nuclear security governance?
3. How does the underrepresentation of women affect nuclear policy-making and strategic decision-making processes?
4. To what extent are existing institutional policies effective in promoting gender inclusion in security institutions?
5. What practical policy measures can enhance women's participation in nuclear security and strategic institutions in Pakistan?

### **Scope of the Study**

The study here is targeted towards strategic nuclear security institutions in Pakistan such as policy advisory bodies, regulatory institutions, and scientific research institutions engaged in the sphere of nuclear governance. It does not include operational roles in military action, nor battlefield-level analysis. The scope is not tactical military functions but governance and policy-making and institutional participation structures.

### **Significance of the Study**

The significance of this study is a multi-faceted one. It is academically valuable for feminist security studies for the new focus on nuclear governance, a relatively under-studied area. It fills a gap between gender studies and the considerations of strategic security literature.

The findings offer evidence-based policy recommendations to enhance gender inclusion in high-security institutions from a policy perspective. These recommendations are applicable to institutional change, recruitment process, and leadership development program. With a governance lens, the study shows that a diversified decision-making process contributes to the resilience of institutions, risk assessment and policy effectiveness. Last, socially it helps to bring gender parity issues in Pakistan up for discussion, especially in traditionally male dominated strategic sectors.

## 2. Literature Review

Over the past 30 years, the field of gender and security has undergone a dramatic transformation from state-centric to more gender-inclusive and human centric perspectives. Until recently, gender was not considered a category for security studies, and the emphasis was put on military strength, deterrence, and geopolitics. However, this narrow view was later criticized by feminist scholars who saw security as a socially-constructed notion influenced by the gender power dynamics (Tickner 2001).

Cynthia Enloe (2014) states that international security systems are highly gendered and in many cases count on the invisible work of women, while simultaneously keeping them away from formal security decision making. The operation of military and security institutions relies on the contributions of both formal and informal, and sometimes ignored, marginalized parties, Enloe said. In cases of nuclear governance this is especially true as the institutions are more hidden because of confidentiality and hierarchies.

Carol Cohn's (2013) important work on nuclear discourse has pointed to the way in which technical language in defence institutions can dehumanise the discussion about security. She believes that the language of nuclear policy is characterised by abstract, mathematical and technical concepts that often leave out of the picture those who are not socialised into masculinised epistemologies of security knowledge. This process of gender exclusion further gives greater weight to technical rationality than to social or ethical aspects in strategic decisions.

Further, Hudson et al. (2012) offer empirical evidence that gender-inclusive institutions work better in conflict prevention and policy resilience. Their study finds that more gender-equality societies are less likely to resort to violent conflict and are more likely to establish stable government systems. They have also made important contributions to studies of peace and conflict but there is limited application of their work for the nuclear security governance, especially in South Asia.

In the literature of South Asian countries, there are continuing differences in gender representation in defence and strategic domains. However, as noted by Kapur (2019), although a larger number of women are now involved in education and other civil services, they have yet to be represented in defense-related strategic institutions in countries such as Pakistan and India. Some of the institutional, cultural and mentorship issues that are cited as factors hindering women's progression in security industries are summarized below.

The majority of gender and security research in Pakistan has centered on peacekeeping missions, military recruitment, or administrative involvement in military institutions. But the study of nuclear governance has been scarcely developed in the academic world. This is a critical gap because nuclear security institutions work under special circumstances of security, technical specialization and secrecy that can exacerbate gender exclusion.

Moreover, feminist security theory highlights that knowledge production in the field of security studies is not neutral. Tickner (2001) suggests that traditional security approaches tend to favour masculine views of rationality, control and technical expertise and discount alternative approaches. This theoretical approach is crucial to understanding why women are still under-represented in the nuclear decision-making system despite a growing number of highly qualified women in related fields.

This also applies to the notion of “epistemic exclusion”. As Cohn (2013) notes, security institutions tend to have a very technical definition of expertise, and this can at times leave out of the conversation those who do not behave in line with the dominant institution. In the context of nuclear governance, this exclusion is further strengthened by the strict clearance regime, promotion systems, and lack of transparency in recruitment procedures. In general, the literature outlines a clear pattern: although the issue was addressed to include women as gender in global security is a prominent topic, their participation in nuclear governance is still limited, particularly in the developing world such as Pakistan. This discrepancy underscores the need for empirical studies, which focus on both women's lived experiences and structural barriers in strategic security institutions.

### **3. Research Methodology**

The current research is a mixed methods research design that explores the involvement of women in Pakistan's strategic nuclear security bodies. The aim of the mixed-method approach is to highlight both observable positions of women in the institutions and the underlying processes of these structures that cannot be measured or quantified at a glance. The methodology enables the study to correlate statistical patterns to real-world experiences in intricate and sensitive security contexts.

#### **3.1 Research Design**

This research design is a combination of quantitative descriptive analysis and qualitative interpretive inquiry. The quantitative dimension aims to draw maps of the placement of women at different levels of nuclear security institutions, namely at entry-level, technical, administrative and policy-making levels.

The qualitative perspective is concerned with the issues of institutional culture, work experiences and constraints influencing women's career path. This dual architecture allows studying “what is happening” and “why it is happening” in the nuclear governance systems.

#### **3.2 Population and Sampling Strategy**

The target population includes professionals working in strategic security institutions, policy advisory bodies, and nuclear-related governance organizations. Since direct access to all institutional members is not feasible due to confidentiality constraints, a purposive sampling technique was used.

A total of 25 participants were selected based on their relevance to the research objectives. The sample included policy analysts, researchers, administrative officers, and strategic planners. Both male and female participants were included to ensure balanced perspectives on institutional dynamics.

#### **3.3 Data Collection Methods**

Data were collected using three primary methods:

##### **1) Document Analysis**

Official institutional reports, recruitment records, and publicly available policy documents were reviewed to gather quantitative data on gender representation. This helped establish baseline statistics on women's participation in strategic institutions.

##### **2) Semi-Structured Interviews**

In-depth interviews were conducted to explore personal experiences, institutional challenges, and perceptions regarding gender inclusion. The semi-structured format allowed flexibility in responses while maintaining focus on key themes such as recruitment, promotion, and workplace culture.

##### **3) Secondary Data Review**

Relevant academic studies, policy frameworks, and organizational guidelines were also reviewed to contextualize findings within broader national and international discussions on gender and security governance.

### 3.4 Data Analysis Procedures

The data analysis process was divided into two components:

#### Quantitative Analysis

Descriptive statistical tools were used to calculate gender distribution percentages across institutional categories. This helped identify patterns of underrepresentation and concentration of women in specific roles.

#### Qualitative Analysis

Thematic analysis was applied to interview transcripts. Data were coded into recurring themes such as:

#### Institutional barriers

- Cultural and social constraints
- Career progression challenges
- Access to leadership roles
- Perceptions of gender bias in security institutions

These themes were further grouped into broader categories to understand structural patterns affecting women's participation in nuclear governance.

### 3.5 Research Framework

The study is guided by an interdisciplinary framework combining gender analysis and institutional behavior. It examines how formal rules (such as recruitment policies) and informal norms (such as workplace culture and networking systems) interact to shape gender inclusion or exclusion in strategic security environments.

### 3.6 Ethical Considerations

Due to the sensitive nature of nuclear security institutions, strict ethical guidelines were followed. Participants were informed about the purpose of the study before interviews, and their consent was obtained. Confidentiality was maintained throughout the research process by using pseudonyms instead of real names. Data were stored securely to prevent unauthorized access. No sensitive or classified institutional information was requested or recorded.

### 3.7 Limitations of the Study

The study acknowledges certain limitations. Access to nuclear security institutions is restricted due to confidentiality protocols, which limited the depth of organizational data available. The sample size, while sufficient for qualitative insight, may not fully represent all institutional perspectives. Additionally, reliance on self-reported experiences may introduce subjective bias.

### 3.8 Strength of Methodology

Despite these limitations, the methodological design ensures strong analytical depth through triangulation of multiple data sources. The combination of statistical evidence and qualitative narratives enhances the reliability of findings and provides a comprehensive understanding of gender dynamics in nuclear security governance.

## 4. Dataset with Thematic Structure

The dataset for this study was constructed from institutional reports, recruitment records, and semi-structured interviews conducted with 25 participants working in or associated with strategic security institutions. To maintain confidentiality and ethical integrity, all participants were assigned pseudonyms. The dataset combines numerical representation data with qualitative narrative insights to ensure a holistic understanding of gender participation in nuclear security governance.

### 4.1 Quantitative Dataset Overview (Institutional Representation 2015–2025)

The institutional dataset shows a persistent gender gap across strategic security roles:

- Total workforce in sampled institutions: 100%

- Women’s overall representation: less than 12%
- Men’s representation: more than 88%

**Role-wise distribution pattern:**

- Administrative roles: Highest female presence (moderate inclusion)
- Technical/scientific roles: Low female representation
- Policy advisory roles: Very minimal female presence
- Strategic decision-making roles: Extremely limited or near absence

This pattern indicates occupational clustering, where women are concentrated in supportive roles while being excluded from strategic governance structures.

**4.2 Qualitative Dataset**

Pseudonym	Role Category	Institutional Position
Analyst A	Policy Analyst	Strategic Research Unit
Officer B	Technical Officer	Nuclear Regulatory Support
Researcher C	Academic Expert	Security Studies Division
Planner D	Strategic Planner	Defense Coordination Unit
Advisor E	Senior Advisor (Retired)	Strategic Governance Consultant
Officer F	Administrative Officer	Security Secretariat
Analyst G	Junior Policy Researcher	Think Tank Division
Engineer H	Technical Specialist	Scientific Research Wing
Officer I	Mid-level Administrator	Nuclear Support Unit
Planner J	Strategic Analyst	Policy Development Cell

**4.3 Thematic Coding Structure**

From qualitative interviews, the following major themes emerged:

Theme 1: Institutional Barriers

Participants highlighted structural limitations in recruitment, promotion, and access to specialized training programs. Many reported that entry pathways into strategic roles are indirectly restrictive.

Theme 2: Gendered Occupational Segregation

A consistent pattern of role segregation was observed, where women are placed in administrative or documentation roles rather than technical or strategic positions.

Theme 3: Informal Network Influence

Several respondents noted that informal professional networks significantly influence career progression, often favoring long-established male-dominated circles.

Theme 4: Limited Leadership Access

Women reported minimal access to leadership training programs and strategic assignments, limiting their upward mobility within institutions.

Theme 5: Perception of Security Work as Masculine

A recurring narrative suggests that nuclear and defense-related work is culturally perceived as male-oriented, discouraging women from pursuing long-term careers in this sector.

**4.4 Pattern Synthesis from Dataset**

When combining quantitative and qualitative findings, a clear structural pattern emerges:

- Women are present in the system but not proportionally represented in decision-making roles
- Institutional pipelines favor technical male-dominated career trajectories
- Advancement opportunities are unevenly distributed
- Gender inclusion is symbolic in entry roles but limited in leadership structures

**4.5 Key Analytical Insight**

The dataset demonstrates that gender disparity in nuclear security institutions is not simply numerical but structural. Even where women are present, institutional design and cultural norms restrict their transition into strategic authority positions. This suggests that inclusion is not only about recruitment but also about transformation of institutional pathways and governance culture.

### **5. Theoretical Analysis**

The analysis of women's participation in Pakistan's nuclear security institutions is grounded in a combination of feminist security theory, institutional theory, and constructivist approaches to security governance. These frameworks collectively help explain how gendered structures are embedded in strategic institutions and how they shape access, authority, and decision-making power.

#### **5.1 Feminist Security Perspective**

Feminist security theory challenges the traditional assumption that security institutions are neutral, merit-based systems. Instead, it argues that security knowledge and institutions are historically shaped by gendered power relations. In the context of nuclear governance, this perspective is crucial because strategic security environments often privilege masculine-coded attributes such as technical rationality, hierarchy, control, and militarized decision-making.

Within Pakistan's nuclear institutions, these gendered assumptions manifest in subtle but structural ways. Women may be formally included in the workforce, yet they remain underrepresented in strategic decision-making roles. This reflects what feminist theorists describe as "symbolic inclusion," where participation exists in numbers but not in influence or authority.

#### **5.2 Institutional Theory and Structural Constraints**

Institutional theory explains how formal rules and informal norms shape organizational behavior over time. In nuclear security institutions, formal recruitment policies may appear neutral; however, informal practices often determine actual career progression.

Key institutional mechanisms influencing exclusion include:

- Hierarchical promotion systems based on seniority and internal networks
- Limited transparency in selection for strategic assignments
- Concentration of decision-making power within closed professional circles
- Preference for traditionally established career pathways in defense and engineering fields

These institutional structures create path dependency, meaning that historical gender imbalance continues to reproduce itself over time, even without explicit discrimination.

#### **5.3 Constructivist Interpretation of Security Roles**

Constructivist theory emphasizes that security is socially constructed rather than purely technical or objective. In this framework, the concept of a "security expert" is shaped by socially shared beliefs, norms, and institutional expectations.

In Pakistan's strategic environment, nuclear expertise is often socially constructed as a masculine domain associated with technical strength, authority, and defense-oriented thinking. As a result, women entering this field may be perceived as exceptions rather than standard participants.

This social construction influences:

- Recruitment preferences
- Perceptions of leadership capability
- Allocation of strategic responsibilities
- Informal workplace credibility

Thus, exclusion is not only structural but also symbolic and cultural.

#### 5.4 Intersection of Secrecy and Gender Exclusion

A unique feature of nuclear governance is its reliance on secrecy and restricted access. While secrecy is necessary for national security, it also reinforces institutional closure. This creates an environment where informal networks become highly influential.

From a theoretical perspective, secrecy amplifies gender exclusion in three ways:

- It limits external accountability mechanisms
- It strengthens reliance on internal trust networks
- It reduces transparency in career progression pathways

These conditions often disadvantage women, particularly in male-dominated institutional cultures where access to informal networks is limited.

#### 5.5 Synthesis of Theoretical Frameworks

When combined, these theories reveal a multi-layered explanation for gender imbalance:

- Feminist theory explains why security is gendered
- Institutional theory explains how exclusion is structurally maintained
- Constructivism explains how meanings of authority and expertise are socially produced

Together, they demonstrate that women's underrepresentation in nuclear security institutions is not the result of a single barrier but a system of interconnected structural, cultural, and epistemological constraints.

#### 5.6 Key Theoretical Insight

The theoretical synthesis suggests that improving gender inclusion in nuclear security requires more than policy reform. It requires transformation at three levels:

1. Structural reform of institutional pathways
2. Cultural redefinition of security expertise
3. Epistemic inclusion of diverse forms of knowledge in strategic governance

Without addressing all three levels, gender disparity is likely to persist even in the presence of formal inclusion policies.

### 6. Discussion and Analysis

The conclusion of this study shows that there is a sharp gender imbalance in terms of structural and cultural issues in Pakistan's nuclear security institutions. Though women have been making little headway in education and public-sector jobs, their influence on strategic security governance is still very restricted. This is also the case in other areas of the world as women are under-represented in high-security and defense-related activities compared to other professions (UNDP 2022). In the field of nuclear governance, however, the effects of exclusion are more serious as the decisions made directly affect the security stability of the nation and the region.

#### 6.1 Deep-Rooted Structural Exclusion in Strategic Institutions

One of the key findings is the high level of occupational segregation in nuclear security institutions, with women overrepresented in the administrative or clerical category and underrepresented in the technical, advisory and decision making roles. This not only underrepresents the level of inequalities in employment but also institutional design that reinforces inequalities in the hierarchy.

These patterns are similar to the ones observed in other world defense sectors, where women are generally not included in strategic decision-making despite the presence of formal equality policies (Enloe 2014). In the context of Pakistan, the recruitment systems may favor engineering and military and technical streams, traditionally attended by men. Consequently, even qualified women are seen as having indirect barriers to access strategic positions.

Cohn (2013) points out that security institutions often tend to understand “expertise” in technical and masculinized terms, thereby systematically silencing other viewpoints. This is why, even when women are present in institutions, they are not as likely to be given high level strategic assignments.

### **6.2 Gendered Production of Security Knowledge**

Another important conclusion is that nuclear security knowledge is not a purely technical, but a social construct. It reveals that the perceptions of competence held by institutions are shaped by deeply-entrenched gendered ideas of authority, rationality and leadership. According to Tickner (2001), traditional models of security are based on masculine coded characteristics, including control, technical mastery and decisiveness. These traits are then built into the institutional assessment and evaluation systems used for recruitment and promotion. In Pakistan's nuclear institutions, this leads to implicit bias, singling out men for leadership roles even if there are no formal discriminatory policies. The gendered framing of expertise restricts the recognition of other skills, like analytical communication, ethical thinking, and interdisciplinary problem solving that are crucial in complex nuclear governance contexts.

### **6.3 Détente and the End of the Cold War**

Exclusion of women has direct impact on policy diversity and quality of strategic decision making. The lack of wider social, ethical and humanitarian concerns in discussions about nuclear policy was mentioned by respondents. This tight definition can limit institutions' flexibility in reacting to new security challenges like cyber threats to nuclear facilities, environmental threats, and possible regional turmoil.

Gender-inclusive institutions have the advantage of leveraging a variety of cognitive frameworks and thus, according to Hudson et al. (2012), improve policy resilience. Homogeneous environments for decision making may suffer from strategic rigidity and from restricted threat perception, on the other hand. The lack of women in nuclear governance is thus a gender issue as well as a policy-making gap.

#### **7.4.1 The Context of the Culture at the Institution**

The study identifies institutional culture as one of the critical factors which contributes to gender exclusion. Career advancement in the country's nuclear security context is also largely determined by informal networks, networking opportunities, and recognition based on hierarchy and seniority. These are usually informal arrangements that also contribute to actual opportunities for promotion in addition to the formal systems.

Enloe (2014) points out that where there is formal equality, gender inequalities have the potential to be reproduced through informal institutional practices. This is exacerbated by the secrecy in the field of nuclear governance, which cuts down on transparency and external accountability, thus fostering a stronger trust-based network internally.

Consequently, women can be part of formal decision-making processes, but be absent in the informal decision-making where strategic influence happens.

This course describes the socio-cultural constraints affecting the development and use of careers and related information. In addition to institutional issues, broader norms and values in the socio-cultural sphere also constrain women's engagement in nuclear security institutions. Defense & strategic sectors are traditionally considered more male dominated sphere in Pakistan, thus affecting organizational culture and individual career decisions.

In the South Asian context, Kapur (2019) observes that women may not be encouraged to pursue careers in defense and strategic areas for longer periods of time because of societal pressures. The cultural expectations affect recruitment pools and the number of women seeking specialized security occupations. In addition, women's advancement to strategic roles is hindered by a lack of mentorship and role models as well as structured leadership pathways.

### **7.7 Inconsistencies and Alternative Explanations of Events**

The nuclear governance maintains confidentiality with great care, in order to ensure national security. This study, however, reveals that also the lack of transparency plays a role in institutional closure. Lack of transparency in selection and promotion hampers external scrutiny, and enhances the use of internal selection processes. Access to knowledge and decision-making in highly classified environments of security tends to be limited to the narrow band of individuals who work there, what Cohn (2013) calls epistemic closure. In the Pakistani context, this is further contributing to the gender imbalance, with women's visibility restricted in strategic pathways. Enloe (2014) furthermore states that such institutional configurations may look neutral, but are actually operating in ways that maintain the status quo of power distribution. The research finds that there has been a trend towards symbolic inclusion, as women are increasingly hired in entry-level jobs, but not in leadership and policymaking positions. This is a disparity between representation and real power.

Cohn (2013) identifies this as a typical pattern in technical security institutions, where diversity is present, but is not manifested in the institutional structure. In Pakistan's nuclear governance system, it translates to women's participation in the education process and recruitment are steadily rising but they are still far from occupying strategic authority within institutions.

### **7.8 Comparative Global and Regional Perspective**

Worldwide, there is a positive correlation between gendered representation in governance and better institutional performance, transparency, and effectiveness (UNDP 2022). But at present, it is one of the least gender-integrated sectors in the world, technical in nature and sensitive to security considerations.

Pakistan, like the rest of the world, is characterized by exclusion but in a more pronounced manner particularly in the strategic security arenas. Moreover, Hudson et al. (2012) highlight that societies with greater gender equality are more resilient, with the implication that nuclear governance gender imbalance may also have long-term strategic consequences.

### **7.9 Analytical Synthesis**

In conclusion, the study provides an evidence base showing that gender bias in Pakistan's nuclear security institutions is not simply attributable to one cause, but is a consequence of a complex of structural exclusion, cultural norms, institutional secrecy and epistemological bias.

Feminist security theory is used to account for gendered institutional knowledge, institutional theory for the on-going existence of institutional obstacles, and constructivist theories for ways in which authority and expertise are socially constructed. These frameworks together point to the need for structural, cultural and epistemic change, not just policy changes, in order to achieve meaningful reform.

## **8. Conclusion**

The present study analyzed the status of women representation in Pakistan's strategic nuclear security institutions, institutional obstacles and what it means for the nuclear governance of the country. The results were again very clear; although there has been an increase in women's education and their overall participation in the public sector, there has been a lack of women in nuclear security institutions, especially in the policy-making, advisory and strategic decision-making positions. Fewer than 12% of the people in these institutions are women, suggesting that there is a strong structural gender imbalance in one of the most sensitive areas of national security governance.

The analysis reveals that gender imbalance is not caused by a single factor, it is a result of an intricate relationship between institutional structures, cultural norms and

epistemological frameworks. Women face fewer advancement opportunities due to structural barriers, including restricted recruitment process, hierarchical promotion systems, and lack of access to strategic jobs. Meanwhile, societal norms also influence the perception of defense and nuclear security as masculine professions, which hinders women's continuous involvement in these spheres.

While institutional secrecy is necessary for the protection of national security, it also has a negative impact on transparency in career progression and decision making processes. This sometimes creates an informal network that is dominated by men, thereby restricting women from entering influential professional areas. Moreover, the gendered nature of the construction of security expertise further marginalizes women by linking technical knowledge and expertise with masculine coded characteristics.

The study also emphasizes that the lack of women's representation in nuclear governance is not just an issue of gender equality. Limited cognitive variation in policy analysis due to lack of diversity in decision making may restrict risk assessment and strategic innovation. Overall, inclusive governance structures are linked with greater institutional resilience, which implies that gender imbalance could have indirect implications for the quality of nuclear policy outcomes.

### **8.1 Key Findings Summary**

- Women remain significantly underrepresented in strategic nuclear security institutions.
- Their participation is concentrated in administrative rather than strategic roles.
- Institutional promotion systems and informal networks limit upward mobility.
- Cultural perceptions of security work reinforce gendered occupational segregation.
- Secrecy and lack of transparency amplify exclusion in decision-making structures.

### **8.2 Policy Recommendations**

1. Establish a structured gender inclusion policy framework within strategic security institutions.
2. Introduce a minimum 20% representation target for women in technical and policy-making roles over the next five years.
3. Develop transparent recruitment and promotion systems to reduce informal gatekeeping.
4. Create specialized training and leadership programs for women in nuclear and strategic studies.
5. Promote mentorship networks connecting senior professionals with early-career women in security fields.
6. Integrate gender-sensitive modules into defense and strategic studies curricula at academic institutions.

### **8.3 Measurable Outcomes**

- Increase women's representation in strategic roles from less than 12% to at least 20% within five years.
- Ensure at least 30% female participation in training and capacity-building programs in security institutions.
- Improve retention rates of women in defense-related careers by reducing early career attrition.
- Establish formal mentorship programs in at least 50% of strategic security institutions.
- Enhance policy diversity indicators through periodic gender audits of decision-making bodies.

### **8.4 Final Statement**

The study concludes that gender inclusion in nuclear security is not merely a question of equality but a strategic necessity. Enhancing women's participation in Pakistan's strategic security institutions can strengthen institutional resilience, broaden policy perspectives, and improve the overall quality of nuclear governance. Achieving this requires coordinated reforms that address structural, cultural, and institutional barriers simultaneously, ensuring that gender inclusion becomes an integral component of national security architecture rather than a peripheral concern.

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