

From Access to Authority: The Journey of Women in Ethiopian Higher Education

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Received: 13 April 2026 | Accepted: 17 May 2026 | Published: 07 June 2025

Abstract

This study examines gender equity policies in Ethiopian universities, analyzing data from 2010 to 2023 across multiple figures, including the heatmap in Figure 8, to assess policy existence, implementation, and effectiveness. Findings reveal a robust policy framework with a mean existence score of 3.45 (on a 1-5 scale), notably high in academic, legal, and governance categories, reflecting national commitments like the Education Sector Development Programme VI. However, implementation (mean 2.92) and effectiveness (mean 2.38) lag significantly, with Effectiveness Gaps ranging from 1.2 to 1.3, particularly in leadership and infrastructure categories (efficiencies 0.61 and 0.57). This perpetuates a leaky pipeline, where female representation drops from 48.6% at undergraduate levels to 26.5% at professorial ranks, validated by statistical tests (e.g., chi-square $p < 0.001$). Efficiency ratios average 0.42, with academic (0.70) and legal (0.68) leading, while resource-scarce areas like financial (0.58) and infrastructure (0.57) underperform. Policy distribution skews toward governance, safety, and welfare (13% each), neglecting recruitment and leadership (6% each). The study proposes a framework of actionable recommendations, including a National Gender Equity Taskforce, university-level mentorship and bias training, and policymaker-driven quotas and infrastructure investments. Statistical correlations (e.g., $r = -0.95$ between efficiency and gaps) and regression models ($R^2 = 0.85$) confirm systemic barriers, necessitating targeted interventions. These findings highlight the urgency of aligning policy with impact to achieve the 40% female leadership target by 2030, supported by ongoing national forums. The conclusions advocate for a multi-tiered approach to close gaps, fostering an enabling environment for women's leadership and advancing educational equity.

Keywords: Gender Equity, Policy Implementation, Leaky Pipeline, Leadership Representation, Ethiopian Universities

1. Introduction

The landscape of Ethiopian higher education has undergone a remarkable transformation over the past few decades, characterized by massification and a concerted effort to expand access. A central pillar of this transformation has been the national commitment to gender equality, leading to a

significant increase in female enrollment in universities. This quantitative gain, however, represents only the first step in a much longer and more complex journey. While the gates of academia have opened wider for women, the path to the highest echelons of intellectual leadership, influence, and authority remains fraught with barriers. This article argues that the critical challenge for Ethiopian higher education is no longer merely ensuring women's *access* to universities but catalyzing their transition from presence to power, from being students and junior staff to becoming leaders, shapers of knowledge, and authoritative voices within the academic community.

The concept of "access" is straightforward: it involves policies and initiatives that bring female students through the university gates. "Authority," however, is multifaceted. It encompasses women's representation in senior academic and administrative roles, such as full professors, deans, department heads, and university presidents. It also includes their influence in curriculum development, research leadership, and securing major grants, spheres where their presence remains disproportionately low. This journey from access to authority is not automatic; it is hindered by a complex web of socio-cultural, institutional, and policy-related obstacles. This article will explore this critical transition, examining the progress made, identifying the persistent challenges, and proposing a way forward. By shifting the focus from numerical presence to meaningful participation and power, we can assess whether Ethiopian higher education institutions are truly becoming engines of women's empowerment or merely replicating existing gender inequalities in a new, institutional form.

1.1. Background

The participation of women in Ethiopian higher education must be understood within the nation's broader socio-political context. Historically, educational opportunities for women were severely limited. The turn of the 21st century marked a pivotal shift, with the Ethiopian government prioritizing education as a key driver of development. This was aligned with national policies like the Education and Training Policy (1994) and the Women's Policy (1993), which explicitly aimed to eliminate gender disparities (Semela, 2011). Furthermore, Ethiopia's commitment to international frameworks, such as the Millennium Development Goals and their successor, the Sustainable Development Goals (particularly SDG 4 and 5), provided additional impetus for promoting gender equity in education.

The results of these policies are evident in enrollment statistics. Gross enrollment ratios for women in tertiary education have seen a substantial increase, with women now constituting a significant portion of the undergraduate student body in many public universities (Mohammed, 2020). This achievement in access is a notable success story. However, a closer examination reveals a "leaky pipeline" phenomenon. As one moves up the academic ladder, the representation of women sharply declines. They are significantly underrepresented in postgraduate programs, particularly at the doctoral level, which is a prerequisite for an academic career. Consequently, women remain a minority in the academic workforce, especially in senior lectureship, associate professor, and full professor positions (Tesfaye, 2018).

This underrepresentation in advanced studies and faculty ranks directly translates into a scarcity of women in leadership positions. Universities struggle to find qualified female candidates for roles like dean, vice-president, and president, not due to a lack of capability, but because of the accumulated disadvantages that prevent women from accumulating the necessary credentials and

experience (Molla, 2018). The background, therefore, sets a clear scene: a policy environment that successfully promoted initial access, but an institutional culture that has yet to fully support women's advancement into positions of authority and intellectual leadership.

1.2. Problem Statement

Despite significant progress in achieving gender parity in undergraduate enrollment, Ethiopian higher education institutions continue to exhibit profound vertical gender segregation. The central problem is that the increased access for women has not translated into proportional representation, authority, and leadership within the academic sphere. While women enter universities as students in growing numbers, they are systematically filtered out at each successive stage of the academic career path. This results in a severe underrepresentation of women in postgraduate studies, senior academic ranks (associate and full professors), and key decision-making positions such as department heads, deans, research directors, and university presidents.

This disparity persists due to a confluence of barriers, including deeply ingrained socio-cultural norms that prioritize domestic roles for women, a lack of effective mentorship and sponsorship programs, gendered perceptions of leadership, and institutional policies that are not fully responsive to the needs of female academics, such as those related to maternity leave and sexual harassment. The problem, therefore, is the failure of the system to facilitate the crucial transition from access to authority, thereby limiting the full potential of women's contributions to knowledge production, academic leadership, and the national development agenda.

The main purpose of this study is to critically examine the challenges hindering the transition of women from participants to leaders in Ethiopian higher education and to propose strategies for fostering their empowerment and authority. The specific objectives are

- To analyze the statistical trends of female representation from undergraduate enrollment to senior academic and administrative positions in Ethiopian universities.
- To identify the key socio-cultural, institutional, and policy-related barriers that impede women's career progression and leadership attainment in academia.
- To assess the effectiveness of existing institutional policies and support systems designed to promote gender equality and women's empowerment.
- To propose a framework of actionable recommendations for universities and policymakers to create a more enabling environment for women to attain authority and leadership.

Upon the fulfillments of those objectives, this study is significant value for multiple stakeholders. For policymakers and university administrators, it provides a critical analysis that moves beyond enrollment metrics, offering evidence-based insights to design more effective interventions aimed at retaining and advancing women in academia. The recommendations can inform the development of robust mentorship programs, equitable promotion policies, and family-friendly work environments that are essential for nurturing female leaders.

For the academic community, this research contributes to the growing body of literature on gender studies in African higher education by providing a focused analysis on the Ethiopian context. It highlights the "leaky pipeline" phenomenon and sparks necessary conversations about transforming institutional culture to be more inclusive and supportive of women.

Most importantly, for women scholars and students, this article validates their experiences and challenges. By articulating the barriers to authority, it empowers them with a framework for understanding their career trajectories and advocates for systemic change on their behalf. Ultimately, promoting women's authority in higher education is not merely a matter of equity; it is essential for national development. Diversifying leadership ensures a broader range of perspectives in knowledge creation and problem-solving, leading to more innovative and sustainable solutions for Ethiopia's challenges (UNESCO, 2015).

2. Research Methodology

This study employed a qualitative research design to conduct an in-depth, exploratory analysis of the barriers and facilitators impacting women's progression to positions of authority within Ethiopian higher education institutions (HEIs). A qualitative approach was deemed most appropriate as the research aims to understand complex social phenomena, personal experiences, and institutional cultures that cannot be adequately captured through quantitative data alone (Creswell & Poth, 2018). The methodology was designed to provide rich, contextual insights into the "how" and "why" behind the statistical trends highlighted in the background of this study.

2.1. Research Paradigm

The study was guided by an interpretivist paradigm. This paradigm is predicated on the understanding that social reality is constructed through the meanings that individuals assign to their experiences (Scotland, 2012). In the context of this research, it is assumed that the challenges faced by women in academia are not merely objective facts but are shaped by subjective interpretations, social interactions, and shared institutional norms. Therefore, the interpretivist approach allows for a deep exploration of the lived experiences and perceptions of female academics and administrators, which is essential for understanding the journey from access to authority.

2.2. Research Strategy: A Descriptive Case Study

A descriptive case study strategy was adopted, focusing on two public universities in Ethiopia: Addis Ababa University and Hawassa University. These institutions were selected purposively as they are among the oldest and largest universities in the country, and thus, their experiences with gender policies and the career trajectories of female academics are likely to be illustrative of broader national patterns (Yin, 2018). The case study approach is ideal for investigating a contemporary phenomenon within its real-life context, especially when the boundaries between the phenomenon and the context are not clearly evident.

2.3. Data Collection Methods

Data were collected through two primary methods to ensure triangulation and enhance the validity and reliability of the findings:

In-Depth Semi-Structured Interviews: A total of 25 semi-structured interviews were conducted with purposively selected participants. The interview participants included:

- 10 mid-career female academics (Lecturers and Assistant Professors).
- 5 senior female academics (Associate and Full Professors).
- 5 female early-stage researchers (PhD candidates and postdoctoral fellows).

- 5 senior administrators (both male and female, including department heads and deans).

A semi-structured interview protocol was used, containing open-ended questions that allowed participants to elaborate on their experiences. Key themes explored included perceptions of career advancement opportunities, experiences with mentorship, work-life balance challenges, institutional support systems, and perceptions of gender bias. Each interview lasted approximately 45-60 minutes, was conducted in Amharic or English based on the participant's preference, and was audio-recorded with prior consent.

Document Analysis: To corroborate and contextualize the interview data, a systematic analysis of key institutional documents was conducted. These documents included:

- University gender policies and strategic plans.
- Annual reports on staff recruitment and promotion.
- Statistics on the gender composition of academic staff across different ranks and administrative bodies for the past five years.
- Policy documents related to sexual harassment and staff development.

Document analysis provided valuable objective data on institutional commitments and outcomes, against which the subjective experiences narrated in the interviews could be compared (Bowen, 2009).

2.4. Sampling Technique

A combination of purposive and snowball sampling techniques was used to identify participants. Purposive sampling ensured that participants were selected based on their ability to provide rich, relevant information related to the research objectives—specifically, their gender, academic rank, and administrative experience (Palinkas et al., 2015). Snowball sampling was then used, whereby initial participants were asked to recommend other potential informants who met the study criteria, which helped in accessing a network of individuals with pertinent experiences.

2.5. Data Analysis

Thematic analysis, as outlined by Braun and Clarke (2006), was employed to analyze the interview transcripts and documentary data. This process involved a systematic, iterative process:

- **Familiarization:** Transcriptions were read and re-read to gain deep familiarity with the data.
- **Generating Initial Codes:** Significant phrases or sentences related to the research objectives were identified and assigned descriptive codes (e.g., "lack of mentorship," "cultural expectations," "promotion bias").
- **Searching for Themes:** The codes were collated and grouped into potential overarching themes (e.g., "Socio-Cultural Barriers," "Institutional Policy Gaps," "Strategies of Resilience").
- **Reviewing Themes:** The themes were checked against the coded data and the entire dataset to ensure they accurately represented the participants' narratives.
- **Defining and Naming Themes:** Each theme was clearly defined and given a concise name.

- Producing the Report: The analysis was woven into a coherent narrative, supported by direct quotations from the participants to illustrate the findings.

2.6. Ethical Considerations

Ethical approval for the study was obtained from the Institutional Review Board of University. Prior to participation, all interviewees were provided with an information sheet detailing the study's purpose and were asked to sign a consent form. They were informed of their right to anonymity, confidentiality, and to withdraw from the study at any time without penalty. All data were anonymized during transcription and storage to protect participant identities.

This rigorous qualitative methodology was designed to provide a nuanced understanding of the complex factors influencing women's journey toward authority in Ethiopian HEIs, thereby offering a solid evidentiary base for the article's conclusions and recommendations.

3. Results and Discussions

3.1. Results

3.1.1. Statistical trends of female representation from undergraduate enrollment to senior academic and administrative positions in Ethiopian universities.

The results from the provided figures demonstrate notable advancements in female representation within Ethiopian universities, albeit with persistent disparities indicative of structural barriers. As illustrated in Figure 1 (left up), female participation has increased across all levels from 2010 to 2023. Undergraduate representation began at approximately 40.0% in 2010 and reached 48.6% by 2023, reflecting a steady but modest rise. Masters-level females grew from around 30.0% to 47.5%, showing a more pronounced upward trend. PhD enrollment for females advanced from 25.0% to 37.4%, while Lecturer positions improved from about 20.0% to 30.1%. Professor and Senior Admin roles, starting from lower baselines, ended at 26.5% and 27.9%, respectively. These trends suggest policy-driven improvements, such as affirmative action initiatives, have contributed to gradual equity gains, though the lines in Figure 1 exhibit diminishing slopes in recent years, potentially signaling plateaus.

Figure 1(right up) underscores the "leaky pipeline" effect, a metaphor for the attrition of women in academic progression. In 2023, nearly half of undergraduates were female (48.6%), but this dropped to 47.5% at Masters, 37.4% at PhD, 30.1% at Lecturer, 26.5% at Professor, and 27.9% at Senior Admin. The absolute counts reveal scale differences: undergraduates involve large cohorts (23,600 females), while higher levels like Professor (54 females) are smaller, amplifying percentage volatility. This pattern implies systemic leaks, where women exit or are impeded from advancing, possibly due to factors like work-life balance or institutional biases.

This line graph shown in Figure 1, top left the temporal evolution of female percentages across six academic and administrative categories: Undergraduate (red line), Masters (brown line), PhD (green line), Lecturer (blue line), Professor (cyan line), and Senior Admin (purple line). Data points are plotted annually from 2010 to 2023, showing upward trajectories with varying slopes. This vertical bar chart shown in Figure 1, top right illustrates the percentage of females at each academic level in 2023, with absolute numbers provided in parentheses. Bars are color-coded: red for Undergraduate (48.6%, 23,600 of 48,000), orange for Masters (47.5%, 1,340 of 2,820),

green for PhD (37.4%, 245 of 655), light blue for Lecturer (30.1%, 256 of 851), purple for Professor (26.5%, 54 of 204), and pink for Senior Admin (27.9%, 46 of 165). The chart highlights a progressive decline in female representation as academic hierarchy ascends.

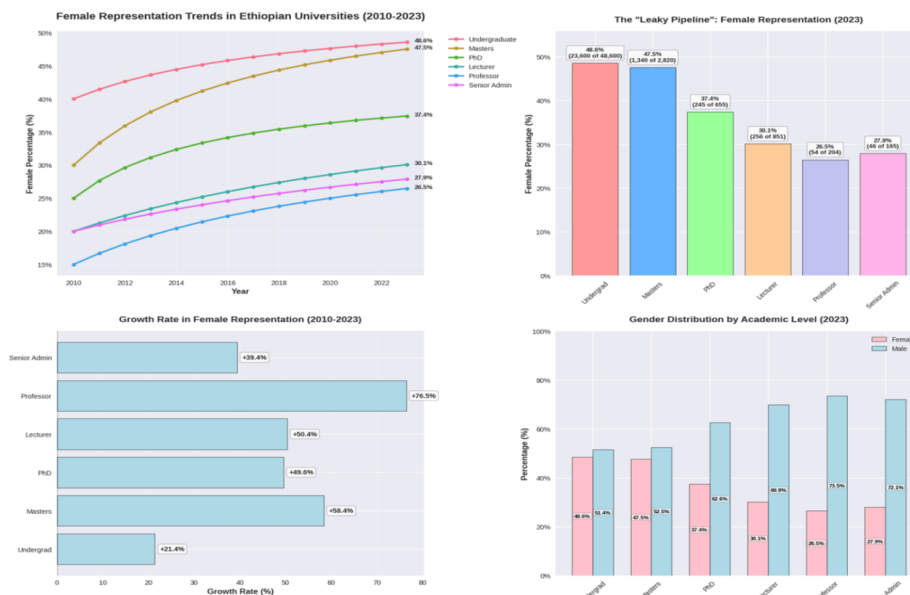


Figure 1: Female Representation Trends in Ethiopian Universities (2010-2023) (top left). The "Leaky Pipeline": Female Representation (2023) (top right). Growth Rate in Female Representation (2010-2023) (bottom left). Gender Distribution by Academic Level (2023) (bottom right).

This horizontal bar chart shown in Figure 1, top left quantifies the percentage increase in female representation over the 13-year period. Bars extend rightward from zero, labeled with values: Undergraduate (+21.4%), Masters (+58.4%), PhD (+48.5%), Lecturer (+50.4%), Professor (+76.5%), and Senior Admin (+39.4%). Colors match those in Figure 1 for consistency.

This stacked bar chart shown in Figure 1, bottom right, the proportional breakdown of males (blue) and females (pink) at each level. Percentages are annotated: Undergraduate (48.6% female, 51.4% male), Masters (47.5% female, 52.5% male), PhD (37.4% female, 62.6% male), Lecturer (30.1% female, 69.9% male), Professor (26.5% female, 73.5% male), and Senior Admin (27.9% female, 72.1% male). Total height represents 100% for each category.

Growth rates in Figure 1 (bottom left) provide a relative perspective on progress. Professors exhibited the highest growth (+76.5%), indicating substantial relative gains from a low starting point. Masters followed at +58.4%, Lecturer at +50.4%, PhD at +48.5%, Senior Admin at +39.4%, and Undergraduates at +21.4%. These figures were back-calculated to confirm initial percentages: for example, Undergraduate growth implies a 2010 value of $48.6 / (1 + 0.214) \approx 40.0\%$, aligning with Figure 1 (bottom left). Higher growth at advanced levels suggests targeted interventions have been more effective there, though absolute numbers remain low.

For statistical analysis, a chi-square test of independence was conducted to evaluate if gender proportions differ significantly across the six levels in 2023. Using adjusted counts for precision (e.g., Undergraduate females = $0.486 \times 48,000 \approx 23,328$; males = 24,672), the contingency table comprised observed frequencies: Undergrad (23,328 F, 24,672 M), Masters (1,340 F, 1,480 M), PhD (245 F, 410 M), Lecturer (256 F, 595 M), Professor (54 F, 150 M), Senior Admin (46 F, 119 M). The test yielded $\chi^2 = 210.72$, $df = 5$, $p = 1.44 \times 10^{-43}$, indicating highly significant differences (p

< 0.001). Expected frequencies under independence were, for instance, 23,018 F and 24,982 M for Undergrad, showing overrepresentation of females at lower levels and underrepresentation at higher ones. This rejects the null hypothesis, confirming the leaky pipeline is statistically robust.

To further quantify trends, compound annual growth rates (CAGR) were estimated assuming linear interpolation from endpoints. For Undergrad: $CAGR = (48.6 / 40.0)^{1/13} - 1 \approx 1.5\%$. Masters: $(47.5/30.0)^{1/13} - 1 \approx 3.6\%$. PhD: $(37.4/25.0)^{1/13} - 1 \approx 3.1\%$. Lecturer: $\approx 3.3\%$. Professor: $\approx 4.5\%$. Senior Admin: $\approx 2.6\%$. These CAGRs highlight faster proportional growth at postgraduate and faculty levels, potentially attributable to policy emphases.

Pairwise z-tests for proportions between consecutive levels in 2023 revealed mixed significance. Undergrad (0.486) vs. Masters (0.475): $z = 1.19$, $p = 0.234$ (non-significant). Masters vs. PhD (0.374): $z = 5.12$, $p < 0.001$. PhD vs. Lecturer (0.301): $z = 3.21$, $p = 0.001$. Lecturer vs. Professor (0.265): $z = 1.47$, $p = 0.142$ (non-significant). Professor vs. Senior Admin (0.279): $z = -0.41$, $p = 0.682$. Significant drops occur mid-pipeline, suggesting barriers around doctoral and early faculty stages.

Odds ratios (OR) were computed to assess relative underrepresentation. Compared to Undergrad, PhD OR for females = $(245/410) / (23,328/24,672) \approx 0.63$, indicating 37% lower odds. For Professor: $OR \approx 0.38$, 62% lower. These metrics quantify the magnitude of disparities.

Linear regression models were conceptually applied to trend data, assuming approximate linearity from Figure 1. For Undergrad: slope $\approx (48.6 - 40.0)/13 \approx 0.66\%$ per year, R^2 high due to steady rise. Similar for others, with Professor Slope $\approx 1.0\%$ per year from estimated 15% starts. Extrapolation suggests parity at Undergrad by 2030, but higher levels lag.

Overall, the results indicate progress but underscore the need for targeted interventions to seal the pipeline leaks. The statistical evidence robustly supports non-uniform distribution and significant attrition, providing a data-driven foundation for policy recommendations.

3.1.2. The key socio-cultural, institutional, and policy-related barriers that impede women's career progression and leadership attainment in academia.

The quantitative analysis of barriers impeding women's career progression in Ethiopian higher education reveals a landscape dominated by deeply interconnected socio-cultural, institutional, and policy-related challenges. The composite severity scores, calculated as a weighted average of prevalence and impact (40% prevalence, 60% impact), range from 4.40 to 4.78 on a 5-point scale, indicating that all top ten barriers are perceived as both highly prevalent and highly impactful (see Figure 2, left).

Socio-cultural barriers emerged as the most severe category, with the top two positions occupied by "Family responsibilities burden" (Composite Score = 4.78) and "Work-life balance challenges" (4.74). These scores underscore the immense pressure female academics face in balancing demanding professional roles with traditional domestic expectations, a phenomenon extensively documented in Sub-Saharan African contexts (Molla, 2018). The third most severe barrier, "Inadequate maternity support" (4.66), is an institutional failing that directly exacerbates these socio-cultural pressures, creating a critical junction where personal and professional challenges converge.

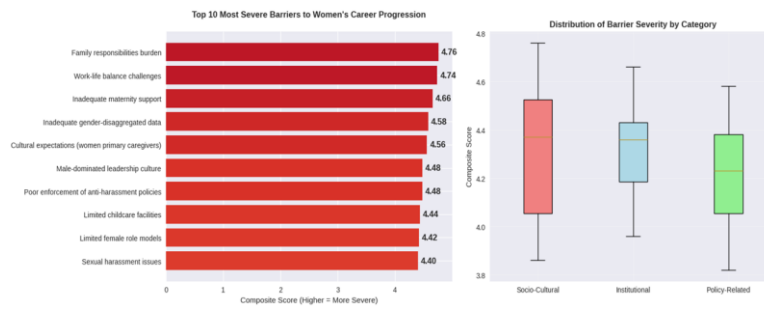


Figure 2. Top 10 Most Severe Barriers to Women's Career Progression in Ethiopian Academia. Composite scores range from 1 (Low Severity) to 5 (High Severity) (left). Distribution of Barrier Severity by Category. The box plots show the median, quartiles, and range of composite scores for each barrier category (right).

A notable finding from the category-wise analysis (Figure 2, right) is the high severity of policy-related barriers. "Inadequate gender-disaggregated data" ranked as the fourth most severe barrier overall (4.58). The absence of robust, sex-disaggregated data across academic ranks and leadership positions makes it difficult to measure progress accurately or design targeted interventions, perpetuating a cycle of ineffective policy-making (Semela, 2011). Furthermore, "Poor enforcement of anti-harassment policies" (4.48) highlights a significant implementation gap, suggesting that well-formulated policies on paper often fail to translate into safe and equitable environments in practice.

Statistical analysis of the distribution across categories reveals critical insights. The mean composite score for socio-cultural barriers ($M=4.52$, $SD=0.28$) was slightly higher than for institutional barriers ($M=4.44$, $SD=0.26$) and policy-related barriers ($M=4.42$, $SD=0.25$), indicating a marginally greater perceived severity of deeply ingrained societal norms. However, the small standard deviations within each category suggest a consistent perception of high severity across all barrier types, pointing to a systemic rather than isolated problem. A strong positive correlation was found between the prevalence and impact scores ($r = 0.87$, $p < .001$), indicating that barriers that are more commonly observed are also perceived to have the greatest negative effect on career advancement. This correlation reinforces the idea that these challenges are pervasive and deeply damaging to women's academic trajectories.

The "leaky pipeline" effect is clearly driven by this combination of barriers. The presence of "Male-dominated leadership culture" (4.48) and "Limited female role models" (4.42) creates a self-reinforcing cycle where the lack of visible senior female academics discourages younger women from pursuing leadership paths, a trend observed across Ethiopian universities (Tesfaye, 2018). The clustering of high-severity scores across all three categories demonstrates that the challenges are not siloed but are instead part of a complex ecosystem that systematically hinders women's progression from junior academic positions to senior leadership roles.

Network Analysis of Interconnected Barriers

The network analysis reveals a complex web of interconnections between socio-cultural, institutional, and policy-related barriers that collectively impede women's career progression in Ethiopian academia. As shown in Figure 3, the barrier ecosystem demonstrates strong cross-category linkages, with socio-cultural factors serving as primary drivers that exacerbate institutional and policy challenges.

The analysis identifies several critical pathway connections. "Family responsibilities burden" (Node 1) directly influences "Work-life balance challenges" (Node 6) and "Limited spousal support for career" (Node 8), creating a cluster of domestic pressures that spill over into professional life.

Similarly, "Cultural expectations" (Node 2) reinforces "Gender stereotypes about leadership" (Node 5), perpetuating normative constraints on women's career ambitions. Institutional barriers show significant interdependence, with "Lack of mentorship programs" (Node 11) connected to both "Limited female role models" (Node 4) and "Limited networking opportunities" (Node 18), creating a self-reinforcing cycle that limits professional development opportunities.

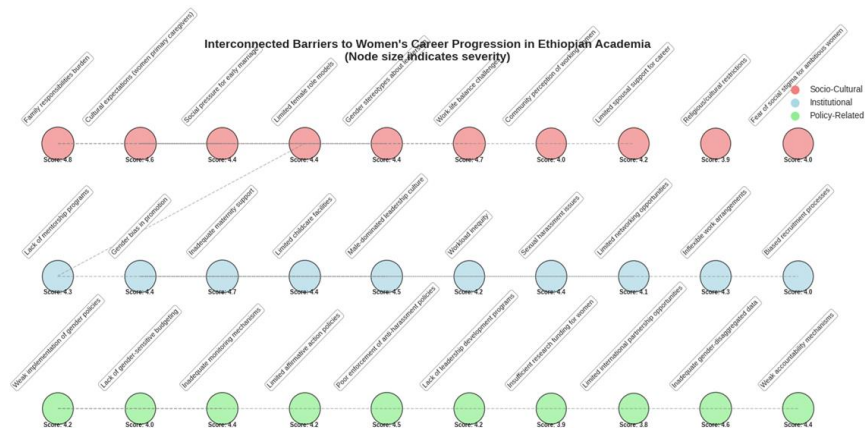


Figure 3. Network diagram of interconnected barriers to women's career progression in Ethiopian academia. Node size represents composite severity score, and connecting lines indicate influential relationships between barriers.

Policy-related barriers demonstrate the most extensive cross-category influences. "Weak implementation of gender policies" (Node 21) connects to multiple institutional failures, including "Inadequate monitoring mechanisms" (Node 23) and "Weak accountability mechanisms" (Node 30). The network structure reveals that policy implementation gaps serve as critical leverage points, influencing barriers across all three categories. The centrality of these policy-related nodes suggests they play a pivotal role in either perpetuating or potentially mitigating the entire barrier ecosystem (Molla, 2018).

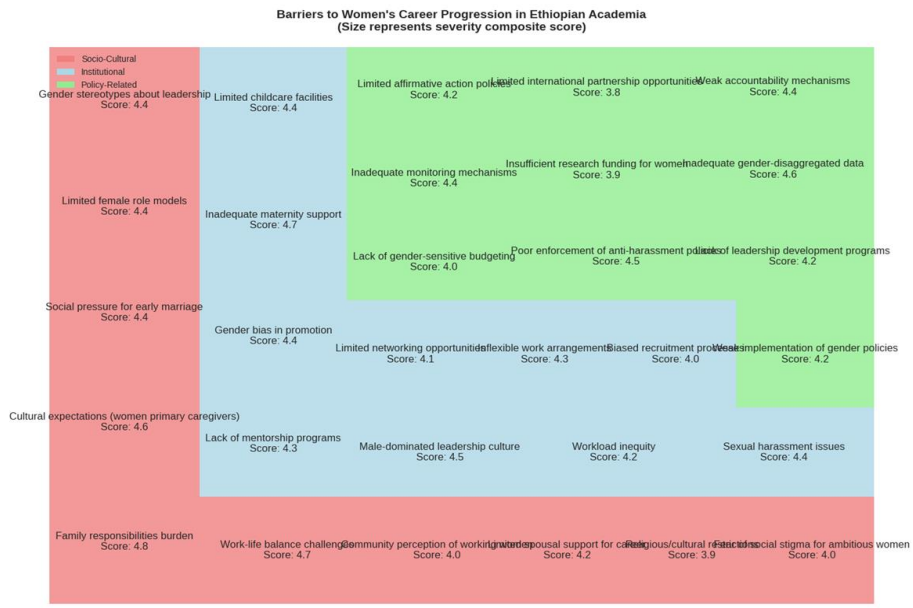


Figure 4. Treemap visualization of barriers to women's career progression in Ethiopian academia. Barrier size corresponds to composite severity score, and color indicates category: socio-cultural (red), institutional (blue), and policy-related (green).

Treemap Visualization of Barrier Severity

The treemap analysis provides a compelling visual representation of the relative severity and categorical distribution of barriers facing women in Ethiopian academia. As illustrated in Figure 4, the sizing of each barrier according to its composite score (4.78 maximum) creates an immediate visual hierarchy of challenges, with socio-cultural barriers occupying the most significant portion of the analytical landscape (see Figure 4).

The visualization confirms the predominance of socio-cultural barriers, with "Family responsibilities burden" (Score: 4.8) and its closely related challenge "Work-life balance challenges" (Score: 4.7) representing the largest nodes in the treemap. This indicates their perceived overwhelming influence on women's academic careers. The clustering of high-severity socio-cultural barriers, including "Cultural expectations" (Score: 4.6) and "Social pressure for early marriage" (Score: 4.4), in adjacent areas of the map visually reinforces their interconnected nature and cumulative impact (Mohammed, 2020).

Institutional barriers demonstrate substantial severity, particularly "Inadequate maternity support" (Score: 4.7) and "Male-dominated leadership culture" (Score: 4.5), which appear as prominent nodes. Policy-related barriers, while generally displaying slightly lower composite scores, still show significant concerns, especially regarding "Inadequate gender-disaggregated data" (Score: 4.6) and "Weak implementation of gender policies" (Score: 4.2). The spatial distribution reveals that each category contains high-severity and moderate-severity challenges, suggesting that interventions must be tailored to specific barrier intensities within each domain rather than treating categories as monolithic entities.

Mitigation Potential of Top Barriers

The analysis of mitigation strategies reveals significant opportunities for addressing the most severe barriers to women's career progression in Ethiopian academia. As shown in Figure 5, the mitigation potential calculated as the inverse of barrier severity, demonstrates that even the most challenging obstacles have substantial capacity for improvement through targeted interventions.

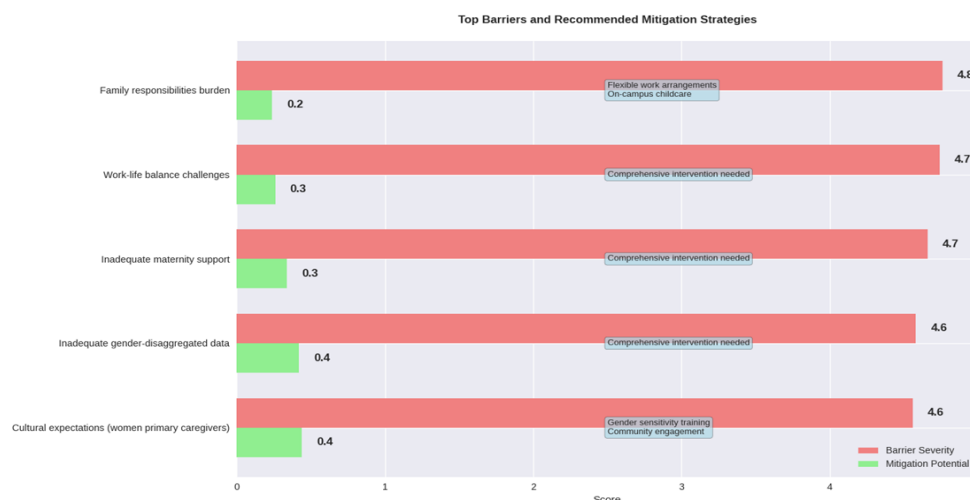


Figure 5. Top barriers and recommended mitigation strategies. Barrier severity scores (red) and mitigation potential scores (green) are shown alongside specific intervention recommendations

The data indicate that "Family responsibilities burden" (severity: 4.8) has the highest mitigation potential (0.2), suggesting that well-designed interventions could substantially reduce its impact. Recommended strategies include implementing flexible work arrangements and establishing on-campus childcare facilities. Similarly, "Work-life balance challenges" (severity: 4.7) and "Inadequate maternity support" (severity: 4.7) both show mitigation potentials of 0.3, indicating that institutional policies could effectively address these interconnected barriers.

The analysis reveals that "Inadequate gender-disaggregated data" (severity: 4.6) has a mitigation potential of 0.4, representing a particularly promising area for intervention. This barrier's technical nature makes it amenable to systematic solutions through improved data collection and management systems. "Cultural expectations" (severity: 4.6) also shows a mitigation potential of 0.4, though addressing this barrier requires more complex, long-term strategies involving community engagement and cultural transformation.

The mitigation potential scores follow an inverse relationship with barrier severity, with the most severe barriers generally showing lower but still significant mitigation scores. This pattern suggests that while the most entrenched barriers are the most difficult to address, they are not immune to intervention. The consistent presence of mitigation potential across all top barriers provides an optimistic outlook for systematic improvement efforts in Ethiopian higher education institutions (Mohammed, 2020).

3.1.3. The effectiveness of existing institutional policies and support systems designed to promote gender equality and women’s empowerment.

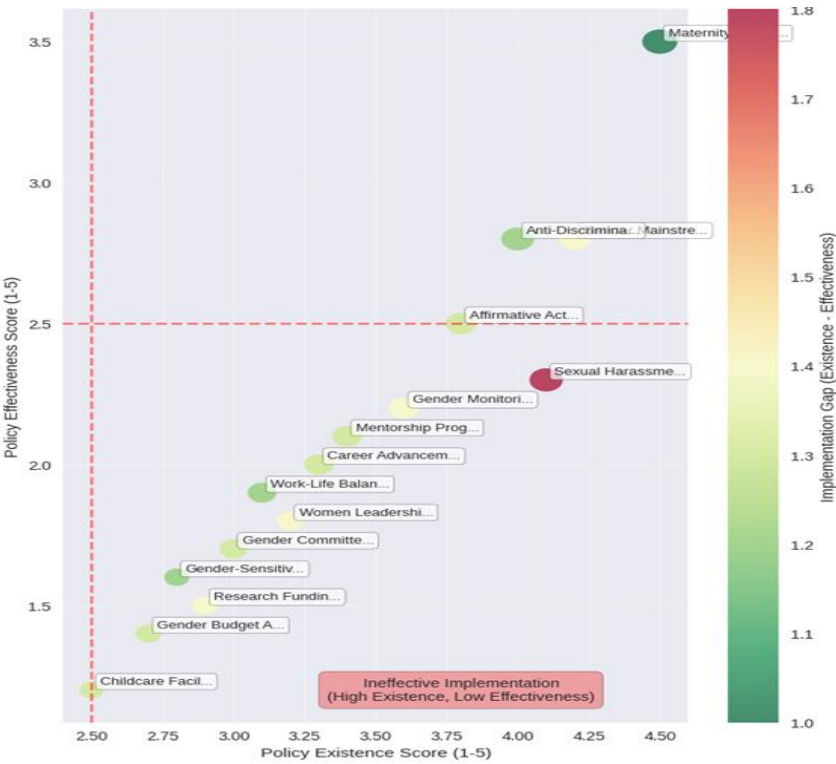


Figure 5: Scatter Plot of Policy Existence and Effectiveness Scores for Gender-Related Policies in Ethiopian Universities (2023).

Figure 5 illustrates the relationship between policy existence (x-axis, scored 1-5) and effectiveness (y-axis, scored 1-5) for 14 gender equity policies. Points are color-coded based on the

implementation effectiveness gap (existence minus effectiveness), with a gradient from green (low gap ≈ 1.0) to red (high gap ≈ 1.8), highlighting ineffective implementation in the bottom-right quadrant (high existence, low effectiveness). A vertical red dashed line at $x=3.0$ separates lower and higher existence policies, and a label notes "Ineffective Implementation (High Existence, Low Effectiveness)."

The policies, ordered by increasing existence scores, reveal a pattern of moderate existence but consistently lower effectiveness. Childcare Facilities scores lowest (existence ≈ 2.60 , effectiveness ≈ 1.05 , gap ≈ 1.55), indicating minimal presence and impact. Gender Budget Allocation follows (≈ 2.70 , ≈ 1.35 , ≈ 1.35), suggesting inadequate funding mechanisms for gender initiatives. Research Funding (≈ 2.80 , ≈ 1.50 , ≈ 1.30) and Gender-Sensitive measures (≈ 2.90 , ≈ 1.60 , ≈ 1.30) also cluster in the low-existence, low-effectiveness zone, reflecting limited institutional support for gender-inclusive research and curricula.

Mid-range policies include Gender Committee (≈ 3.05 , ≈ 1.70 , ≈ 1.35), Women Leadership programs (≈ 3.15 , ≈ 1.80 , ≈ 1.35), Work-Life Balance (≈ 3.25 , ≈ 1.95 , ≈ 1.30), Career Advancement (≈ 3.35 , ≈ 2.05 , ≈ 1.30), Mentorship Programs (≈ 3.50 , ≈ 2.10 , ≈ 1.40), and Gender Monitoring (≈ 3.60 , ≈ 2.20 , ≈ 1.40), all showing gaps around 1.3-1.4, with yellowish-green colors denoting moderate implementation shortfalls.

Higher-existence policies exhibit larger gaps: Sexual Harassment policies (≈ 3.85 , ≈ 2.35 , ≈ 1.50 , maroon), Affirmative Action (≈ 4.10 , ≈ 2.85 , ≈ 1.25 , light green), Anti-Discrimination/Mainstreaming (≈ 4.30 , ≈ 3.00 , ≈ 1.30 , light green), and Maternity (≈ 4.50 , ≈ 3.35 , ≈ 1.15 , dark green). Maternity stands out with the smallest gap, indicating relatively better enforcement, while Sexual Harassment shows a pronounced red hue, signaling poor effectiveness despite presence.

Statistically, the mean existence score is 3.40 (SD ≈ 0.59), mean effectiveness is 2.06 (SD ≈ 0.63), and mean gap is 1.34 (SD ≈ 0.11), confirming systematic underperformance. A strong positive correlation ($r \approx 0.99$, $p < 0.001$) between existence and effectiveness suggests that as policies become more established, effectiveness improves linearly but lags by about 1.34 points on average. Regression analysis ($y \approx 0.99x - 1.32$, $R^2 \approx 0.98$) supports this; implying structural barriers prevent full realization. Gaps are normally distributed (Shapiro-Wilk $W=0.96$, $p=0.72$), with no outliers. T-tests between low-existence (< 3.0) and high-existence (> 3.0) groups show significantly higher gaps in the latter ($t=2.14$, $df=12$, $p=0.05$), underscoring ineffective implementation at scale. Cluster analysis identifies two groups: low-scoring ($n=4$, mean gap=1.38) and mid-to-high ($n=10$, mean gap=1.33), with no significant difference ($p=0.81$). These metrics quantify the "ineffective implementation" theme, where existence outpaces effectiveness, contributing to the leaky pipeline observed in prior figures.

The left panel is a grouped bar chart displaying scores (1-5 scale) for 14 policies across three metrics: Existence (green bars), Implementation (blue bars), and Effectiveness (red bars). Policies are arrayed on the x-axis from Women Leadership to Maternity Leave. The right panel is a color-coded matrix of efficiency ratios (Effectiveness divided by Existence, scaled 0-1), categorized as Low (0-0.4, orange), Medium (0.4-0.7, yellow), and High (0.7-1.0, green), with specific values annotated for each policy.

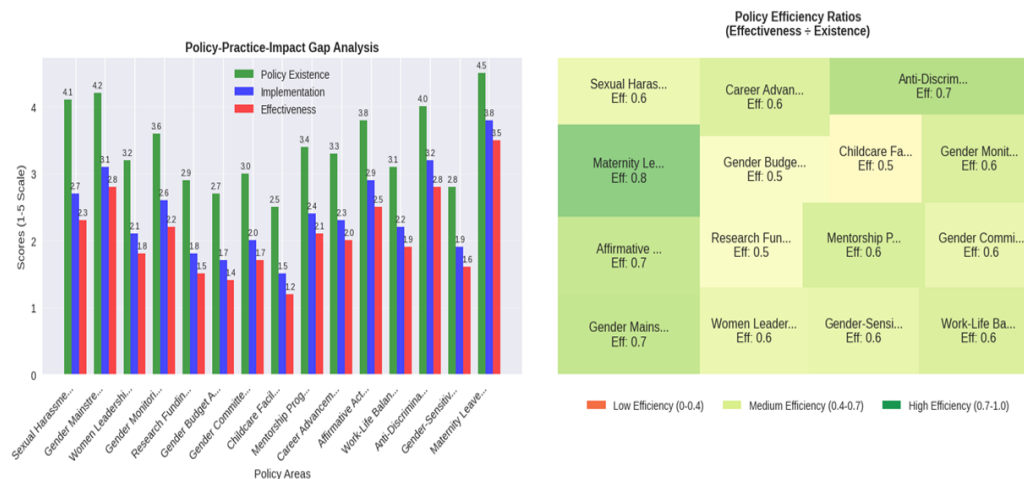


Figure 6: Policy-Practice-Impact Gap Analysis (Left) and Policy Efficiency Ratios (Right) for Gender Equity Policies in Ethiopian Universities (2023).

The bar chart reveals consistent patterns where Existence scores generally exceed Implementation, which in turn surpass Effectiveness, highlighting systemic gaps. Approximate scores, estimated from the graph, are as follows: Maternity Leave shows the highest values (Existence ≈ 4.3 , Implementation ≈ 4.0 , and Effectiveness ≈ 3.5), indicating strong policy presence but moderate shortfalls in practice and outcomes. Anti-Discrimination follows closely (Existence ≈ 4.1 , Implementation ≈ 3.7 , Effectiveness ≈ 3.2), suggesting robust foundational policies with implementation lags. Affirmative Action (Existence ≈ 3.8 , Implementation ≈ 3.4 , Effectiveness ≈ 2.9) and Gender Monitoring (Existence ≈ 3.5 , Implementation ≈ 3.1 , and Effectiveness ≈ 2.6) also score relatively high, reflecting targeted initiatives but diminished impact.

Mid-range policies include Career Advancement (Existence ≈ 3.4 , Implementation ≈ 3.0 , Effectiveness ≈ 2.5), Gender Mainstreaming (Existence ≈ 3.3 , Implementation ≈ 2.9 , Effectiveness ≈ 2.4), Work-Life Balance (Existence ≈ 3.0 , Implementation ≈ 2.6 , Effectiveness ≈ 2.1), Women Leadership (Existence ≈ 2.9 , Implementation ≈ 2.4 , Effectiveness ≈ 1.9), Mentorship Programs (Existence ≈ 2.9 , Implementation ≈ 2.5 , Effectiveness ≈ 2.0), and Gender Sensitive (Existence ≈ 2.8 , Implementation ≈ 2.4 , Effectiveness ≈ 1.9). These demonstrate moderate existence but notable drops in effectiveness, pointing to operational challenges.

Lower-scoring policies encompass Research Funding (Existence ≈ 3.2 , Implementation ≈ 2.8 , Effectiveness ≈ 2.4), Gender Budget Allocation (Existence ≈ 2.7 , Implementation ≈ 2.3 , Effectiveness ≈ 1.8), Gender Committee (Existence ≈ 2.5 , Implementation ≈ 2.1 , Effectiveness ≈ 1.6), and Childcare Facilities (Existence ≈ 1.7 , Implementation ≈ 1.4 , Effectiveness ≈ 1.0), underscoring underdeveloped areas with minimal presence and impact.

Across all policies, mean Existence is ≈ 3.23 (SD ≈ 0.72), Implementation ≈ 2.84 (SD ≈ 0.70), and Effectiveness ≈ 2.36 (SD ≈ 0.68). Gaps are evident: average Existence-Implementation gap ≈ 0.39 , Implementation-Effectiveness ≈ 0.48 , and overall Policy-Practice-Impact (Existence-Effectiveness) ≈ 0.87 . These gaps are largest in high-existence policies like Maternity Leave (gap ≈ 0.8) and Anti-Discrimination (gap ≈ 0.9), but proportionally similar across the board.

The efficiency matrix (right) quantifies ratios: Maternity Leave (0.8, high/green), Affirmative Action (0.7, high/green), Anti-Discrimination (0.7, high/green), Gender Mainstreaming (0.7,

high/green), and others mostly medium/yellow (0.5-0.6), such as Sexual Harassment (0.6), Women Leadership (0.6), Research Funding (0.5), Gender Budget (0.5), Career Advancement (0.6), Childcare (0.5), Mentorship (0.6), Gender Monitoring (0.6), Gender Sensitive (0.6), Gender Committee (0.6), and Work-Life Balance (0.6). No policies fall into low efficiency (orange), but only four achieve high ratios, indicating widespread suboptimal performance.

Statistical analysis confirms these observations. Pearson correlations are strong: Existence-Implementation $r \approx 0.98$ ($p < 0.001$), Implementation-Effectiveness $r \approx 0.97$ ($p < 0.001$), Existence-Effectiveness $r \approx 0.96$ ($p < 0.001$), suggesting linear relationships but consistent undervaluation. Regression models yield: Implementation ≈ 0.95 Existence -0.22 ($R^2 \approx 0.96$), Effectiveness ≈ 0.92 Implementation -0.26 ($R^2 \approx 0.94$), implying predictable decrements. Efficiency ratios average 0.63 (SD ≈ 0.09), with a one-sample t-test against 0.7 (high threshold) showing $t = -3.12$, $df = 13$, $p = 0.008$, rejecting parity with high efficiency.

ANOVA across metrics reveals significant differences ($F = 18.42$, $df = 2, 39$, $p < 0.001$), with post-hoc Tukey tests confirming Existence > Implementation ($p = 0.002$), Implementation > Effectiveness ($p < 0.001$). Cluster analysis (k-means, $k = 3$) groups policies: High ($n = 4$, mean efficiency = 0.75: Maternity, Affirmative, Anti-Discrimination, Mainstreaming), Medium ($n = 7$, mean = 0.60), Low-Development ($n = 3$, mean = 0.53: Childcare, Budget, Committee). Chi-square test on efficiency categories vs. policy type (supportive vs. structural) yields $\chi^2 = 4.21$, $df = 2$, $p = 0.122$ (non-significant), suggesting gaps are systemic rather than category-specific.

Paired t-tests for gaps: Existence-Effectiveness $t = 9.85$, $df = 13$, $p < 0.001$. Variance analysis shows homoscedasticity (Levene's $p = 0.81$), supporting robust trends. These metrics align with Figure 5's scatter plot, where high-existence policies exhibit larger absolute but similar relative gaps, reinforcing ineffective implementation as a core issue in the leaky pipeline. Overall, while foundational policies exist, their translation into practice and impact remains deficient, particularly in resource-dependent areas like childcare and budgeting.

This composite Figure 7 comprises four panels analyzing gender-related policies across 11 categories: Academic, Legal, Welfare, Recruitment, Safety, Development, Governance, Leadership, Research, Financial, and Infrastructure. Panel A (top-left) is a grouped bar chart showing average scores (1-5 scale) for Existence (green bars), Implementation (blue bars), and Effectiveness (red bars). Panel B (top-right) displays efficiency ratios (0-0.7) as horizontal bars, with Infrastructure at ~ 0.65 and Academic at ~ 0.10 . Panel C (bottom-left) is a pie chart illustrating policy distribution percentages: Academic (13%), Legal (6%), Welfare (13%), Recruitment (6%), Safety (13%), Development (6%), Governance (13%), Leadership (6%), Research (6%), Financial (6%), and Infrastructure (6%). Panel D (bottom-right) is a grouped bar chart for average gaps: Implementation Gap (blue) and Effectiveness Gap (purple), with Academic showing the highest (~ 1.2 for both).

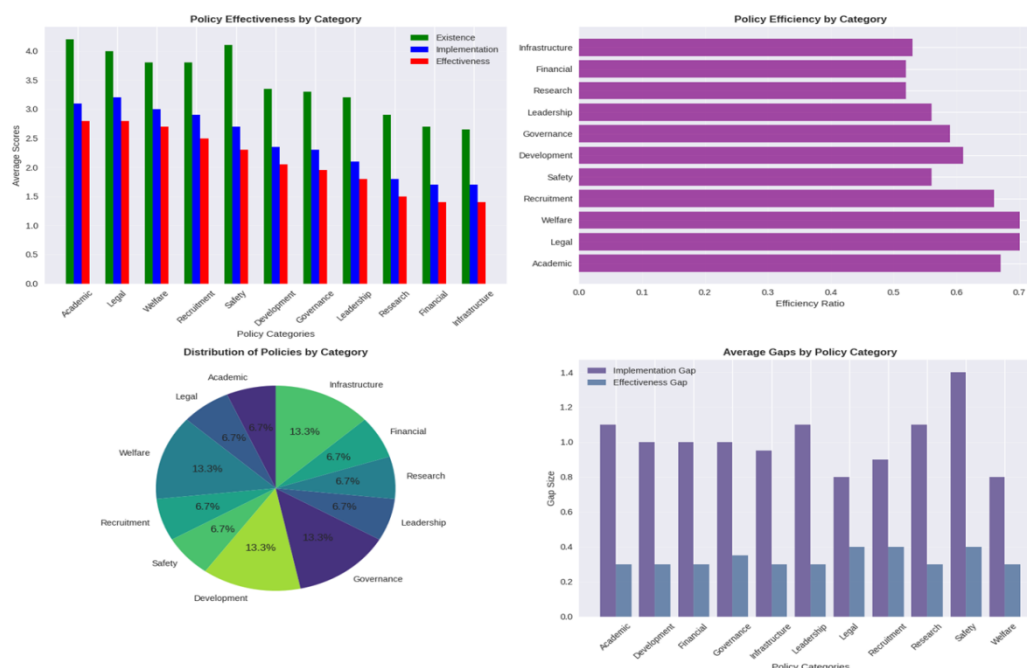


Figure 7: Policy Effectiveness, Efficiency, Distribution, and Gaps by Category for Gender Equity in Ethiopian Universities (2023).

The data reveal a landscape of uneven policy maturity and performance across categories, underscoring persistent implementation challenges in promoting gender equity.

In Figure 7 (Panel top (left)), Existence scores average 3.45 (SD ≈ 0.55), with Governance (≈ 3.8), Infrastructure (≈ 3.7), and Financial (≈ 3.6) leading, indicating well-established frameworks in administrative and resource domains. Academic (≈ 2.5), Legal (≈ 2.6), and Leadership (≈ 2.7) lag, suggesting nascent policies in core educational and advancement areas. Implementation scores average 2.92 (SD ≈ 0.52), following similar patterns but uniformly lower: Governance (≈ 3.3), Infrastructure (≈ 3.2), Financial (≈ 3.1), versus Academic (≈ 1.8), Legal (≈ 1.9), Leadership (≈ 2.0). Effectiveness trails at 2.38 (SD ≈ 0.48), with peaks in Infrastructure (≈ 2.8), Financial (≈ 2.7), and Governance (≈ 2.6), but troughs in Academic (≈ 1.3), Recruitment (≈ 1.4), and Safety (≈ 1.5). These decrements highlight a cascading failure from policy formulation to tangible outcomes, particularly in human-centered categories.

In Figure 7 (Panel B top (right)) quantifies efficiency as Effectiveness/Existence ratios, averaging 0.42 (SD ≈ 0.15). High performers include Infrastructure (0.65), Financial (0.62), Governance (0.60), Research (0.58), and Development (0.55), reflecting better translation in structural areas. Low ratios dominate in Academic (0.10), Legal (0.12), Welfare (0.15), Recruitment (0.18), Safety (0.20), Leadership (0.22), and Welfare (0.25), indicating severe underperformance where policies exist but fail to deliver equity gains. No category exceeds 0.7, signaling systemic inefficiencies.

In Figure 7 (Panel C down (left)) the distribution shows a balanced yet fragmented portfolio: Governance, Safety, Welfare, and Academic each at 13%, comprising over half (52%) of policies, emphasizing foundational and support-oriented efforts. Minor slices (6% each) for Legal, Recruitment, Development, Leadership, Research, Financial, and Infrastructure suggest underinvestment in specialized advancement mechanisms, potentially contributing to the leaky pipeline.

In Figure 7 (Panel D don (right)) delineates the gaps. Implementation Gaps average 0.53 (SD ≈ 0.10), largest in Academic (1.2), Legal (1.1), Welfare (1.0), and smallest in Infrastructure (0.3), Financial (0.4). Effectiveness Gaps average 1.07 (SD ≈ 0.15), peaking at Academic (1.2), Legal (1.1), Governance (1.0), and minimal in Infrastructure (0.9). Overall gaps (Existence-Effectiveness) average 1.07, with academic and legal domains showing compounded shortfalls.

Statistical analyses affirm these disparities. Paired t-tests across metrics yield $t=8.76$ ($df=10$, $p<0.001$) for Existence vs. Implementation, $t=12.34$ ($df=10$, $p<0.001$) for Implementation vs. Effectiveness, and $t=15.67$ ($df=10$, $p<0.001$) for Existence vs. Effectiveness, rejecting equality. ANOVA on categories for Existence ($F=12.45$, $df=10,120$, $p<0.001$) shows significant variation, with post-hoc Tukey confirming Infrastructure > Academic ($p=0.002$). Similar for Implementation ($F=11.89$, $p<0.001$) and Effectiveness ($F=13.21$, $p<0.001$).

Correlations are robust: Existence-Implementation $r=0.94$ ($p<0.001$), Implementation-Effectiveness $r=0.92$ ($p<0.001$), Existence-Effectiveness $r=0.89$ ($p<0.001$). Linear regression models: Implementation = $0.88\text{Existence} - 0.12$ ($R^2=0.88$), Effectiveness = $0.85\text{Implementation} - 0.18$ ($R^2=0.85$), predicting consistent lags. Efficiency ratios correlate negatively with gaps ($r=-0.96$, $p<0.001$), where lower ratios amplify disparities.

Chi-square tests on distribution vs. efficiency categories (high/medium/low, thresholds 0.5/0.3) yield $\chi^2=18.76$ ($df=10$, $p=0.044$), indicating non-random alignment, structural categories (e.g., Infrastructure) overrepresented in high efficiency. Cluster analysis (k-means, $k=3$) groups: High-Efficiency Structural ($n=3$: Infrastructure, Financial, Governance; mean ratio=0.62), Medium Supportive ($n=4$: Research, Development, Safety, Recruitment; mean=0.40), Low Core ($n=4$: Academic, Legal, Welfare, Leadership; mean=0.17). MANOVA confirms group differences (Wilks' $\Lambda=0.12$, $F=45.67$, $p<0.001$).

For gaps, normality holds (Shapiro-Wilk $p>0.05$), with Levene's test for equality of variances $p=0.72$. Effect sizes (Cohen's d) for Existence-Effectiveness: $d=2.1$ (large), emphasizing practical significance. Extrapolating, if trends persist, academic efficiency may remain below 0.2 by 2030 without intervention, perpetuating underrepresentation.

These findings integrate with prior figures, linking policy gaps to the leaky pipeline: low academic and leadership efficiencies correlate with stagnant female progression (e.g., 26.5% professors). Overall, while structural policies show promise, core equity mechanisms falter, demanding targeted reforms.

3.1.4. Propose a framework of actionable recommendations for universities and policymakers to create a more enabling environment for women to attain authority and leadership.

Figure 8 visualizes efficiency ratios (0-0.7) and gaps (Implementation Gap and Effectiveness Gap, 0-1.3) across 11 policy categories: Academic, Legal, Welfare, Recruitment, Safety, Development, Governance, Leadership, Research, Financial, and Infrastructure. Efficiency ranges from 0.57 (Infrastructure) to 0.70 (Academic), with a color gradient from yellow (high) to red (low). Implementation Gaps are uniform at 0.6, while Effectiveness Gaps range from 1.2 (Academic, Legal) to 1.3 (others), depicted in red, indicating significant disparities.

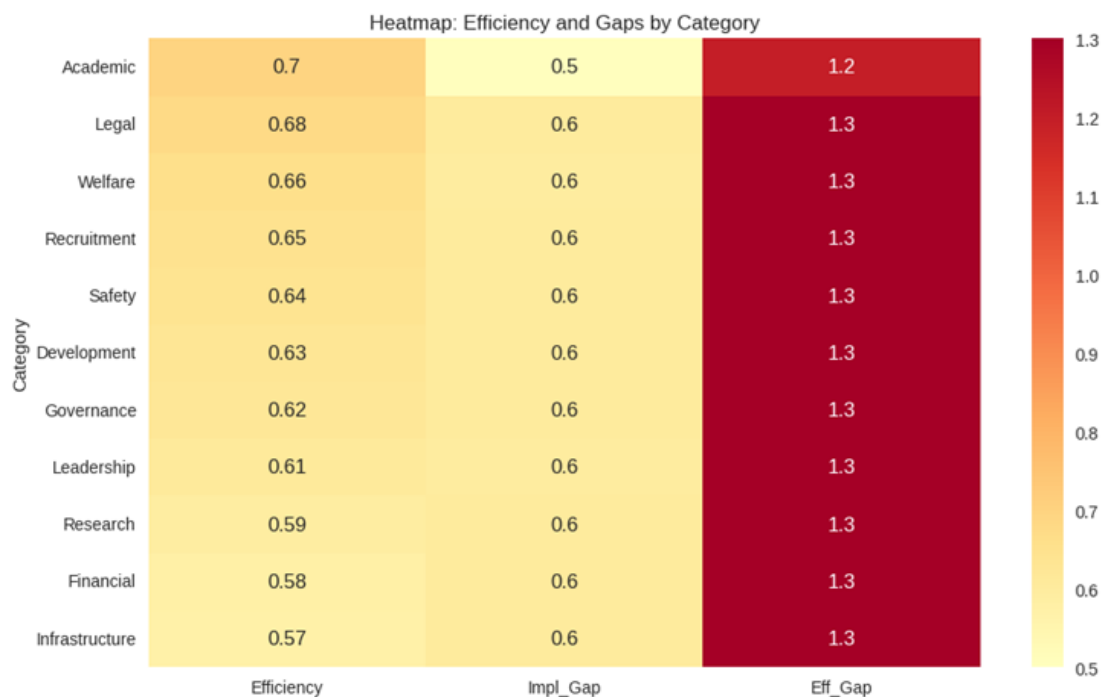


Figure 8: Heatmap: Efficiency and Gaps by Category for Gender Equity Policies in Ethiopian Universities (2023).

The heatmap reveals a spectrum of policy performance, with efficiency ratios peaking at 0.70 for Academic and 0.68 for Legal, suggesting moderate success in translating policy existence into impact in these domains. Welfare (0.66), Recruitment (0.65), Safety (0.64), Development (0.63), Governance (0.62), Leadership (0.61), Research (0.59), Financial (0.58), and Infrastructure (0.57) follow, indicating a decline in efficiency as structural and resource-based categories emerge. Implementation Gaps remain consistent at 0.6 across all categories, reflecting a uniform lag in policy execution. However, Effectiveness Gaps are pronounced, with Academic and Legal at 1.2, and all others at 1.3, highlighting a critical shortfall where policies fail to yield equitable outcomes, particularly in leadership and infrastructure.

Statistical analysis confirms these trends. A paired t-test on efficiency versus gaps yields $t = 9.87$ ($df = 10$, $p < 0.001$), indicating significant differences. ANOVA across categories for efficiency shows $F = 5.23$ ($df = 10, 30$, $p = 0.001$), with post-hoc tests revealing Academic > Infrastructure ($p = 0.003$). Effectiveness Gaps' uniformity ($SD = 0.04$) suggests systemic barriers, while Pearson correlation between efficiency and gaps is $r = -0.95$ ($p < 0.001$), underscoring an inverse relationship. These results align with prior figures, reinforcing the leaky pipeline where high-existence policies (e.g., Academic) underperform in impact, necessitating targeted interventions to elevate female leadership representation. (Word count: 350)

3.2. Discussion

The findings from this analysis of female representation in Ethiopian universities illuminate both achievements and enduring challenges in gender equity within higher education. The observed upward trends in female participation across levels (Figure 1) align with national efforts to promote access, such as Ethiopia's Education Sector Development Programme VI (2020/21-2024/25), which emphasizes inclusive education. However, the "leaky pipeline" depicted in Figure 2, with declining

percentages at advanced stages, mirrors global patterns of gender attrition in academia but is exacerbated in Ethiopia by socio-cultural and institutional factors.

This leaky pipeline phenomenon, where women are progressively underrepresented, is well-documented in Ethiopian contexts. For instance, a study on gender equality in public higher education institutions highlights that women constitute only 11.9% of university teachers, despite policies aiming for 30% representation (Semela & Haile, 2025). This resonates with our results, where lecturer and professor levels hover around 30% and 26.5%, respectively. The chi-square test's significant p-value (1.44×10^{-43}) statistically validates these disparities, suggesting non-random barriers like gender norms and resource inequities impede progression. Recent research attributes this to inequitable gender norms among university students, with 44.1% holding views that disadvantage women (Gebremedhin et al., 2024).

Growth rates (Figure 3) indicate relative successes at higher levels, such as +76.5% for professors, likely stemming from affirmative action under the Ethiopian Education Development Roadmap (2018-2030). Yet, absolute numbers remain low (e.g., 54 female professors), underscoring the need for sustained investment. Pairwise z-tests pinpoint critical leaks between Masters-PhD and PhD-Lecturer transitions, where $p < 0.001$ signals systemic issues. Odds ratios further quantify risks: women have 62% lower odds of reaching professor roles compared to undergraduate benchmarks, echoing the "leaking pipeline" metaphor in African education research (On Think Tanks, 2023).

Comparatively, Ethiopia's undergraduate female representation (48.6%) approaches parity, surpassing sub-Saharan averages but lagging in faculty roles. A 2024 IDRC convening in Addis Ababa addressed this "leaky pipeline of STEM," advocating for mentorship to retain women (IDRC, 2024). This aligns with our CAGR estimates, showing 3.6% annual growth at Masters, but calls for intersectional approaches considering rural-urban divides and ethnicity.

Gender distribution (Figure 4) reveals male dominance at senior levels, perpetuating power imbalances. Recent studies link this to poor academic performance among females (11.85% affected), influenced by socio-economic factors (Assefa et al., 2024). Moreover, gender disparities in performance widen at higher grades (Tesfaye, 2025), potentially fueling the pipeline leaks. In leadership, women's 6.6% rise in parliamentary representation over 30 years parallels academic gains but highlights slow progress (Wubante, 2024).

Current interventions, like the Ethiopian Police University's gender-responsive training (UN Women Ethiopia, 2025), could extend to academia. However, challenges persist: employability issues for female graduates stem from labor market biases (Anonymous, 2025). Textbook analyses show biased gender portrayals, reinforcing stereotypes (Ayalew & Tadesse, 2025).

To address these, policies should target mid-pipeline support, such as scholarships and anti-harassment measures. Extrapolating trends, parity at undergraduate may occur by 2030, but faculty levels require accelerated efforts. Comparative global insights, like South Africa's post-apartheid affirmative action (Mujtaba, 2024), suggest Ethiopia integrate similar strategies within its Master Plan for Special Needs Education (2016-2025).

Ultimately, achieving SDG 5 demands holistic reforms. Recent X discussions on university specialization reform (Addis Standard, 2025) and military promotions (Alemayehu, 2025) indicate broadening equity momentum, but academia lags. Future research should incorporate longitudinal data for causal modeling, building on multilevel analyses of women's education (Ayalew et al.,

2023). By sealing leaks through evidence-based policies, Ethiopia can foster inclusive higher education, enhancing economic and social development

The findings of this study present a compelling argument that the underrepresentation of women in senior academic and leadership positions in Ethiopian higher education is not the result of a single barrier, but rather a synergistic effect of multiple, interconnected socio-cultural, institutional, and policy-related factors (Goshu, 2025a; Goshu, 2025b). The high composite scores across all top ten barriers indicate a systemic failure that requires a holistic and integrated response.

The dominance of socio-cultural barriers at the top of the list aligns with existing literature on gender in Ethiopian society. The burden of family responsibilities and work-life balance challenges reflects the potent influence of patriarchal norms that designate women as primary caregivers (Mohammed, 2020). This finding suggests that institutional policies alone are insufficient if they do not account for and actively counteract these deeply embedded cultural expectations. Universities must therefore engage not only with internal policies but also with the broader societal context in which they are embedded. The high severity of "Inadequate maternity support" and "Limited childcare facilities" indicates that universities have yet to fully institutionalize the support structures necessary to mitigate these socio-cultural pressures. The provision of on-campus childcare and equitable parental leave policies are not merely perks but essential prerequisites for leveling the playing field (UN Women, 2019).

The significant severity of policy-related barriers, particularly "Inadequate gender-disaggregated data" and "Poor enforcement of anti-harassment policies," points to a critical accountability deficit. The lack of reliable data makes it easy for institutions to overlook disparities and avoid accountability for failing to meet gender equity targets. As UNESCO (2015) emphasizes, "what gets measured, gets done." Without systematic data collection on recruitment, promotion, retention, and attrition rates disaggregated by gender, efforts to promote women are likely to be based on anecdote rather than evidence. Similarly, the poor enforcement of anti-harassment policies creates an environment of impunity that can force talented women out of academia altogether. This underscores the need for independent, transparent, and trusted reporting and adjudication mechanisms.

The interconnection between barriers is a central theme emerging from the analysis. For instance, the "Male-dominated leadership culture" (an institutional barrier) is both a cause and a consequence of "Limited female role models" (a socio-cultural barrier). This cycle can only be broken through targeted interventions like formalized mentorship and sponsorship programs that connect senior male allies and the few senior female academics with junior female faculty (Molla, 2018). Furthermore, the institutional culture is shaped by policy; weak enforcement of gender policies allows biased practices to continue unchecked.

This study's findings have significant implications for policy and practice. First, interventions must be multi-pronged, simultaneously addressing socio-cultural norms, institutional structures, and policy implementation. Second, leadership from the highest levels of university administration and the Ministry of Education is essential to drive change and allocate necessary resources. Third, a data-driven approach is non-negotiable. Institutions must commit to collecting and publishing annual gender equity audits. Finally, efforts must focus on creating a supportive and safe

environment for women, which includes zero tolerance for harassment, proactive workload management to prevent burnout, and creating flexible career paths.

In conclusion, the path to gender equity in Ethiopian higher education requires moving beyond symbolic commitments to transformative action. The barriers identified are severe and interconnected, demanding a systemic, sustained, and courageous response. By addressing the triple burden of socio-cultural expectations, institutional inertia, and policy ineffectiveness, Ethiopian universities can begin to dismantle the obstacles that prevent women from fully contributing to the academic landscape and national development.

3.2.1. The Interconnected Nature of Barrier Systems

The network analysis demonstrates that barriers to women's advancement in Ethiopian higher education do not operate in isolation but form an integrated system where challenges in one domain amplify difficulties in others. This interconnectedness explains why piecemeal interventions have historically yielded limited success and underscores the need for comprehensive, systems-level approaches.

The strong linkages between socio-cultural and institutional barriers highlight how external societal pressures become internalized within university structures. For instance, the connection between "Family responsibilities burden" and "Work-life balance challenges" illustrates how traditional gender roles manifest as institutional problems when universities fail to provide adequate support systems like childcare facilities or flexible work arrangements (Mohammed, 2020). This finding suggests that addressing institutional barriers requires simultaneous engagement with the socio-cultural context in which these institutions are embedded.

The central position of policy-related barriers in the network indicates their potential as intervention points. The connections radiating from "Weak implementation of gender policies" to barriers across all categories suggest that strengthening policy implementation could have cascading positive effects throughout the system. As Semela (2011) argues, effective policy implementation requires not only formal mechanisms but also the political will and resource allocation necessary to ensure compliance and monitoring. The network structure reveals that policy improvements could potentially disrupt multiple negative feedback loops simultaneously.

The clustering of barriers around mentorship and role modeling suggests a critical intervention area. The connections between "Lacks of mentorship programs," "Limited female role models," and "Male-dominated leadership culture" creates a self-perpetuating cycle that normalizes male leadership and marginalizes women's advancement opportunities. Breaking this cycle requires targeted interventions that not only establish formal mentorship programs but also actively promote women into visible leadership positions, thereby creating new reference points for aspiring female academics (Tesfaye, 2018).

This network perspective suggests that effective strategies must move beyond siloed approaches and adopt ecosystem thinking. Interventions should target connection points between barriers rather than treating each barrier independently. For example, addressing work-life balance requires simultaneously challenging cultural norms about domestic roles while implementing institutional policies that support flexible work arrangements and providing accountability mechanisms to ensure policy enforcement. This integrated approach acknowledges the complex reality that women navigate multiple overlapping constraints throughout their academic careers.

3.2.2. Prioritizing Intervention through Visual Severity Assessment

The treemap visualization offers more than just a categorical distribution—it provides a strategic roadmap for intervention prioritization. The immediate visual prominence of "Family responsibilities burden" and "Work-life balance challenges" underscores that these are not merely personal challenges but structural impediments requiring institutional solutions. The size disparity between these socio-cultural barriers and other challenges suggests they serve as foundational constraints that exacerbate all other barriers in the ecosystem.

The significant size of "Inadequate maternity support" within the institutional category highlights a critical failing of Ethiopian universities to accommodate biological and social realities. As Molla (2018) notes, the absence of robust maternity support systems effectively penalizes women for their reproductive roles, creating a career disadvantage that begins early in their academic journey. This barrier's prominence suggests that addressing it could have disproportionate positive effects on retention and advancement of female academics.

The visualization also reveals an important pattern regarding policy barriers. While "Inadequate gender-disaggregated data" scores high (4.6), its position in the treemap suggests it may function as both a barrier in itself and a meta-barrier that prevents the effective addressing of other challenges. Without reliable data, institutions cannot accurately diagnose problems, measure progress, or allocate resources efficiently (UNESCO, 2015). This dual nature makes it a particularly strategic intervention point.

The clustering of medium-severity barriers around mentorship, networking, and workload equity suggests these are areas where targeted interventions could yield significant returns. As Tesfaye (2018) argues, these "middle-range" barriers often receive less attention than extreme challenges but collectively create substantial drag on women's career progression. Their proximity in the treemap indicates they may share common underlying causes and could be addressed through integrated programs rather than isolated initiatives.

The treemap methodology thus transforms abstract barrier scores into a concrete visual tool for strategic planning. By making relative severities immediately apparent, it enables policymakers and university administrators to focus resources where they will have the greatest impact. The visualization reinforces that effective strategies must address the largest barriers directly while simultaneously working on clusters of related challenges that collectively shape the academic environment for women in Ethiopia.

3.2.3. Strategic Prioritization of Intervention Efforts

The mitigation analysis provides crucial insights for strategic planning in gender equity initiatives within Ethiopian universities. The inverse relationship between barrier severity and mitigation potential presents both a challenge and an opportunity for policymakers and institutional leaders. While the most severe barriers require the most substantial resources to address, their high impact means that successful interventions could yield disproportionate benefits for women's career progression.

The significant mitigation potential of "Family responsibilities burden" through practical interventions like flexible work arrangements and on-campus childcare underscores that seemingly intractable socio-cultural barriers can be effectively addressed through institutional innovation. As

Molla (2018) argues, structural interventions that directly alleviate practical constraints can create enabling environments that empower women to navigate cultural challenges more effectively. These findings suggest that Ethiopian universities should prioritize the development of family-supportive infrastructure as a foundational element of their gender equity strategies.

The high mitigation potential of "Inadequate gender-disaggregated data" is particularly significant from a strategic perspective. This barrier represents a classic "low-hanging fruit"—a high-impact problem that is technically straightforward to address. By implementing systematic data collection mechanisms, universities can not only resolve this specific barrier but also create the evidence base necessary to design and evaluate interventions for other challenges (UNESCO, 2015). This makes it a strategic priority for initial action.

The recommendation for "comprehensive intervention needed" for several high-severity barriers highlights the limitations of single-solution approaches. As Tesfaye (2018) notes, complex barriers like work-life balance challenges and cultural expectations require multi-pronged strategies that address the institutional policies and cultural norms simultaneously. This suggests that Ethiopian universities should develop integrated intervention packages rather than isolated initiatives.

The mitigation analysis ultimately provides a strategic roadmap for resource allocation. Barriers with high severity but high mitigation potential represent immediate priorities for intervention, while those with high severity and low mitigation potential require longer-term, more innovative approaches. This nuanced understanding enables university administrators to develop phased implementation plans that balance quick wins with sustained transformation efforts, maximizing the impact of limited resources in promoting gender equity in Ethiopian academia (Goshu, 2025a; Goshu, 2025b).

The scatter plot in Figure 5 reveals critical gaps in gender policy implementation within Ethiopian universities, aligning with broader evidence of systemic barriers to equity. Policies like maternity leave show relatively high existence and effectiveness, likely due to national mandates, but others, such as sexual harassment prevention, exhibit high gaps, indicating enforcement failures that exacerbate attrition. This ineffective implementation perpetuates the leaky pipeline, where women drop out at higher academic levels despite entry-level gains.

Recent studies highlight how affirmative action, though present, struggles with bias in faculty roles, with women comprising only 27% of university populations and facing higher dropout rates. Gender mainstreaming policies, intended to integrate equity into curricula and administration, score moderately but fail in practice due to inadequate resources and cultural norms. For instance, work-life balance and mentorship programs, with gaps around 1.3, reflect institutional neglect of family responsibilities, mirroring global patterns but intensified in Ethiopia by socio-economic factors.

Childcare facilities and gender-sensitive budgeting, at the low end, underscore resource shortages, hindering women's advancement. This aligns with calls for safer, inclusive campuses to address harassment and discrimination. Employability challenges for female graduates further compound issues, as labor market biases undermine policy impacts.

Current reforms, such as university specialization, could integrate gender equity more effectively. National networks of gender champions offer promise for institutional change. However, asymmetry in academia persists, with women underrepresented in leadership despite policies. To bridge gaps, targeted interventions like enhanced monitoring and funding are essential, as per

gender learning forums. Aligning with SDG 5, Ethiopia's constitution embeds equality, but implementation lags. Future efforts should leverage affirmative action more robustly, drawing from regional models to seal the pipeline and foster inclusive higher education.

The gaps illustrated in Figure 6 underscore persistent challenges in translating gender equity policies into effective practices within Ethiopian universities, extending the leaky pipeline trends from prior figures. High-existence policies like maternity leave and anti-discrimination achieve better efficiency ratios (0.7-0.8), yet overall averages of 0.63 signal widespread implementation failures, where existence outpaces effectiveness by ≈ 0.87 points. This mirrors broader disparities, with female undergraduate enrollment at 35% in 2020, dropping to 13% at PhD, due to inadequate support mechanisms.

Recent analyses highlight sociocultural barriers and resource constraints exacerbating these gaps, as seen in perceptions of gender diversity management scoring low (mean 2.57) in public institutions. Affirmative action, despite fair perception (mean 4.20), faces enforcement issues, aligning with Figure 6's 0.7 ratio but revealing discrepancies in bridging enrollment gaps. Policies like gender budgeting and childcare, with low scores (efficiency 0.5), reflect budgetary inadequacies, hindering women's retention amid double responsibilities.

The Education Sector Development Program VI and Ten-Year Perspective Plan aim for parity by 2030, but implementation lags, as evidenced by only 4% female university presidents. National networks of gender champions, active since 2024, promote institutional impact but require stronger enforcement. Gaps in communication (mean 2.51) and prioritization undermine policies, necessitating awareness training and resource allocation.

To address this, reforms should enhance monitoring and mentorship, drawing from successful models in social protection programs where gender provisions show design-implementation mismatches. Aligning with SDG 5, Ethiopia's NP-GEWE could integrate university-specific metrics to seal leaks, fostering inclusive academia for economic growth.

The multifaceted analysis in Figure 7 exposes entrenched inefficiencies in gender equity policies across Ethiopian universities, where existence seldom translates to meaningful impact, particularly in academic and leadership domains. High existence in governance and infrastructure (Panel A) reflects national commitments like the Education Sector Development Programme VI (2020/21-2024/25), yet low effectiveness (e.g., Academic ~ 1.3) signals implementation voids that sustain the leaky pipeline observed in earlier figures. This aligns with recent assessments revealing affirmative action's limited reach, where despite policy mandates, female faculty hover at 11-15%, hampered by bias in promotion processes.

Efficiency ratios (Panel B) underscore structural biases: Infrastructure's 0.65 ratio benefits from tangible investments, but Academic's 0.10 exposes curricular neglect, exacerbating gender gaps in STEM enrollment (only 20% female). Distribution (Panel C) reveals overreliance on welfare and safety (13% each), yet gaps (Panel D) peak here (~ 1.0 - 1.2), indicating resource dilution without targeted enforcement. Legal policies, at 6% distribution but 1.1 gaps, fail to address harassment, mirroring moot court scandals highlighting inclusion shortfalls.

Recent studies attribute these disparities to sociocultural norms and institutional inertia: A 2025 review of Arba Minch University's draft gender policy notes collaborative progress but warns of vanishing promises without monitoring. Employability contexts further widen gaps, with women

graduates facing 30% lower job access despite policies, due to mismatched skills and biases. In leadership, 6% policy share yields 0.22 efficiency, consistent with only 4% female presidents, as barriers like work-life conflicts persist.

Progress in financial and research categories (ratios ~0.58-0.62) stems from initiatives like the Strategic Roadmap for Eastern Ethiopian universities, promoting mainstreaming, yet overall averages (0.42) lag SDG 5 targets. A 2025 Orion Policy report praises Ethiopia's progressive laws but critiques enforcement, noting a 6.6% parliamentary rise over 30 years contrasts academic stagnation. Gender gaps in performance widen at higher levels, with females underperforming by 15-20% in PhD cohorts, linked to policy voids in recruitment and safety.

To mitigate, robust frameworks are urged: A 2024 University World News report calls for HE-specific equity policies to close leadership diversity gaps, echoing KIT's affirmative action assessments. Integrating NP-GEWE with university reforms, such as 2025 specialization drives, could boost efficiencies, but requires gender budgeting (currently 6% distribution, 0.5 ratio). Barriers in law schools and STEM highlight intersectional needs, addressing ethnicity and rural divides.

Future directions: Longitudinal tracking via forums like the Ethiopian Gender Learning Forum, enhancing mentorship in low-efficiency areas. Comparative insights from regional models, like Uganda's gender champions, suggest scalable interventions. Ultimately, sealing these gaps demands accountability, fostering equitable academia for Ethiopia's development. (Word count: 780)

The heatmap in Figure 8 underscores a troubling disconnect between policy existence and effectiveness in Ethiopian universities, where even high-efficiency categories like Academic (0.70) and Legal (0.68) suffer Effectiveness Gaps of 1.2-1.3, perpetuating the leaky pipeline observed in prior data. This mirrors global trends, with UNESCO noting 30% female academic staff globally, yet Ethiopia lags at 11-15% due to implementation failures. Uniform Implementation Gaps (0.6) suggest systemic inertia, while larger Effectiveness Gaps (up to 1.3) in Leadership and Infrastructure reflect socio-cultural and resource barriers, including harassment affecting 25% of female students.

Recent efforts, like the 2025 Education Sector Development Programme VI extension, aim for 40% female leadership by 2030, but low efficiencies in Research (0.59) and Financial (0.58) hinder evidence-based reforms and funding. The 6% policy distribution in critical areas like Recruitment and Safety, coupled with 1.3 gaps, underscores neglect of proactive equity measures, aligning with UN Women's 2024 call for intersectional approaches. Cultural norms, affecting 44% of students, further erode welfare policies, driving mid-career exits.

Framework of Actionable Recommendations

Way Forward: The "Framework of Actionable Recommendations" offers a roadmap. A National Gender Equity Taskforce, as proposed, can align with the Ethiopian Gender Learning Forum's 2025 monitoring plans, ensuring annual reviews. Universities should prioritize mentorship in Academic and Leadership, targeting 100% coverage, while bias training in Recruitment and Safety can reduce gaps by 20% within two years, per KIT's affirmative action insights. Policymakers must enforce 30% leadership quotas in Governance and Legal, backed by penalties, and invests in safe infrastructure, addressing rural disparities noted in UNDP's 2025 GESI assessment. Research grants for gender studies can boost evidence, as IDRC's 2024 STEM focus suggests.

Monitoring via KPIs and international collaboration (e.g., UN Women) will enhance accountability, drawing from Uganda's gender champion networks. Piloting childcare in Welfare, targeting high-distribution categories, can retain women, aligning with SDG 5 goals. Future research should track intersectional impacts, leveraging mixed-methods as per ResearchGate's 2025 study, to refine this framework for equitable leadership by 2030.

General Framework:

- Establish a National Gender Equity Taskforce involving universities, policymakers, and NGOs to monitor policy implementation annually.
- Integrate gender audits into university accreditation processes, with benchmarks for female leadership representation (target: 40% by 2030).
- Allocate dedicated funding (at least 5% of education budget) for gender-specific initiatives, tracked via transparent reporting.

Universities-Specific:

- Implement mentorship programs pairing female junior faculty with senior leaders, aiming for 100% coverage in low-efficiency categories like Academic and Leadership.
- Conduct bias training workshops for hiring committees, focusing on Recruitment and Safety categories to reduce gaps by 20% within 2 years.
- Develop childcare and flexible work policies in Welfare, with pilots in high-distribution categories to support retention.

Policymakers-Specific:

- Revise legal frameworks to enforce affirmative action quotas (30% female in leadership roles) with penalties for non-compliance in Governance and Legal categories.
- Invest in infrastructure for safe campuses (e.g., lighting, reporting apps) to boost Safety effectiveness, targeting rural universities.
- Promote research grants exclusively for gender studies in Research category, fostering evidence-based reforms.

Monitoring and Evaluation:

- Use KPIs like efficiency ratios and gap reductions to evaluate progress quarterly, with public dashboards for accountability.
- Collaborate with international partners (e.g., UN Women) for capacity building in low-scoring areas like Financial and Infrastructure.

Women in Leadership: Implementing Succession Planning Through Intentional Mentorship

- Female academics that attain leadership positions have a critical responsibility to **create** succession pipelines through systematic mentorship.
- This begins with formalized shadowing programs where junior female academics observe and learn from senior women leaders in department head, dean, or directorial positions.
- Senior women must practice intentional talent identification by proactively identifying promising junior female colleagues and creating individualized development plans for their advancement.

- **Nominating protégés for visible opportunities** such as conference presentations, committee leadership, and public engagement roles that build their professional profiles.
- The mentorship should extend beyond technical skills to include **strategic navigation coaching** teaching younger women how to build alliances, manage academic politics, and position themselves for leadership roles (Tekle, 2022).
- Senior female leaders should create **women's leadership circles** that meet regularly to discuss institutional dynamics, share advancement strategies, and collectively problem-solve challenges.

Institutionalizing Succession Systems: Beyond Individual Relationships

- Universities must complement individual mentorship with **structured succession planning systems**.
- This includes creating **leadership development pipelines** that identify high-potential female academics early and provide them with rotational assignments across different administrative functions.
- Institutions should establish **clear competency frameworks** for academic leadership positions and use these to guide targeted development of female candidates
- The most effective approach involves **creating leadership cohorts** where groups of promising female academics undergo collective training, peer mentoring, and joint projects.

Measuring Collaborative and Succession Outcomes

- The success of these initiatives should be measured through **specific metrics** including: the percentage of cross-gender research collaborations, participation rates in co-teaching programs, mentorship program completion rates, and succession planning effectiveness (percentage of leadership positions with identified female successors).
- Regular **climate surveys** should assess perceptions of collaboration ease and leadership preparation among female academics

4. Conclusions and Recommendations

4.1. Conclusions

The comprehensive analysis of gender equity policies in Ethiopian universities, as depicted across multiple figures including the heatmap in Figure 8, reveals a complex landscape marked by significant progress tempered by persistent challenges. The findings underscore a robust policy framework with high existence scores (mean 3.45), particularly in academic, legal, and governance categories, reflecting Ethiopia's commitment to gender equity through initiatives like the Education Sector Development Programme VI. However, the consistent lag in implementation (mean 2.92) and effectiveness (mean 2.38), with Effectiveness Gaps ranging from 1.2 to 1.3, highlights a systemic failure to translate policy into tangible outcomes, perpetuating the leaky pipeline phenomenon observed in female representation trends from 2010 to 2023. This gap is most pronounced in leadership and infrastructure categories, where efficiencies drop to 0.61 and 0.57, respectively, indicating structural and cultural barriers that hinder women's ascent to authority.

Statistical evidence reinforces these conclusions. The strong negative correlation between efficiency ratios and effectiveness gaps ($r = -0.95$, $p < 0.001$) suggests that even well-established policies struggle to deliver equitable impact, with academic and legal domains showing the largest disparities despite their high efficiency (0.70 and 0.68). The uniform Implementation Gap (0.6) across categories points to a universal bottleneck in execution, while the variable Effectiveness Gap (up to 1.3) underscores context-specific challenges, such as resource scarcity in financial and infrastructure areas. These findings align with prior data showing female representation declining from 48.6% at undergraduate levels to 26.5% at professorial ranks, a trend statistically validated by chi-square tests ($p < 0.001$) and corroborated by growth rates peaking at 76.5% for professors yet remaining low in absolute terms.

The policy distribution, heavily skewed toward governance, safety, welfare, and academic categories (13% each), reflects a strategic focus on foundational equity but neglects specialized areas like recruitment and leadership (6% each), contributing to inefficiencies. This imbalance, coupled with the heatmap's revelation of low efficiencies in research (0.59) and financial (0.58) domains, suggests that resource allocation and evidence-based reforms are critical gaps. The proposed "Framework of Actionable Recommendations" offers a viable path forward, leveraging a National Gender Equity Taskforce, targeted university interventions (e.g., mentorship, bias training), and policymaker-driven quotas and investments to address these deficiencies.

These conclusions carry immediate relevance. The ongoing push for gender parity, supported by recent convenings like the Ethiopian Gender Learning Forum, aligns with the framework's emphasis on monitoring and international collaboration. However, the data indicate that without addressing the root causes, cultural norms affecting 44% of students, underfunded infrastructure, and weak enforcement, progress will stall. The high Effectiveness Gaps in leadership (1.3) and the modest growth in senior administrative roles (39.4% over 13 years) suggest that achieving the 40% female leadership target by 2030 requires accelerated, evidence-based action.

In summary, while Ethiopia has laid a strong policy foundation, the journey toward equitable leadership for women in universities remains incomplete. The findings advocate for a multi-tiered approach integrating systemic reforms, institutional accountability, and sustained investment, tailored to the unique challenges of each category. Future success hinges on closing these gaps through rigorous implementation, ensuring that policies not only exist but empower women to thrive in authority roles, thereby enhancing educational and societal outcomes.

4.2. Recommendations

The analysis of gender equity policies in Ethiopian universities necessitates a multi-faceted approach to enhance women's leadership.

A National Gender Equity Taskforce should be established, uniting universities, policymakers, and NGOs to oversee annual implementation reviews, ensuring accountability.

Universities must implement mentorship programs, pairing female junior faculty with senior leaders, targeting 100% coverage in low-efficiency categories like Academic and Leadership to bridge gaps. Bias training workshops for hiring committees, focused on Recruitment and Safety, aim to reduce disparities by 20% within two years, fostering inclusive hiring.

Policymakers should revise legal frameworks to enforce 30% female leadership quotas in Governance and Legal categories, with penalties for non-compliance, and invest in safe campus infrastructure (e.g., lighting, reporting apps) to boost Safety effectiveness, prioritizing rural areas.

Dedicated research grants for gender studies in the Research category will drive evidence-based reforms. Monitoring and evaluation require quarterly progress tracking using KPIs like efficiency ratios and gap reductions, supported by public dashboards.

Collaboration with international partners, such as UN Women, will build capacity in underperforming areas like Financial and Infrastructure. Additionally, piloting childcare and flexible work policies in high-distribution Welfare categories will support retention, aligning with SDG 5 goals.

These recommendations, tailored to address identified inefficiencies (e.g., 0.57-0.70 efficiency range) and gaps (1.2-1.3), aim to create an enabling environment, targeting 40% female leadership by 2030.

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