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Female-teacher deployment and the provincial geography of girls' secondary exclusion in Afghanistan, 2002–2021

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Abstract

Afghanistan's girls' enrolment rose from fewer than 800,000 to roughly 3.7 million between 2001 and the late 2010s, yet the rural upper-secondary gender parity index stood at just 0.14. This exclusion is commonly attributed to conservative community attitudes and cultural resistance. This paper argues that the binding constraint was instead supply and deployment of female teachers and proximate secondary schools. Female teachers constituted 42% to 60% of teacher-college graduates but only 36% of the deployed workforce, 90% concentrated in nine urban centres. Across 34 provinces, female-teacher share is strongly associated with girls' enrolment share ($r = .75$, $R^2 = .57$, $N = 34$), converging with the Ministry of Education's own analysis. Rural secondary exclusion followed directly: the gender-parity index cascaded to 0.14, and a rural girl's school-life expectancy was just 4.3 years, despite demonstrable community demand. Demand-side instruments cannot substitute for supply where supply is the binding constraint.

Keywords: Afghanistan; girls' secondary education; teacher deployment; female teachers; gender parity; rural education; fragile and conflict-affected states

1. Introduction

Between 2001 and the late 2010s, Afghanistan's education system experienced a dramatic expansion: girls' enrolment rose from fewer than 800,000 to roughly 3.7 million, a 4.6-fold increase. Yet this aggregate achievement obscures a more troubling floor. By 2016, the rural upper-secondary gender parity index stood at 0.14, just fourteen girls for every hundred boys (Ministry of Education, 2010, Table 2; Pouras Consult ApS, 2016, hereafter ESA 2016). This was not an abstract ratio. The average rural girl could expect just 4.3 years of schooling, against 8.5 for rural boys and 9.6 nationally (ESA 2016). The attrition was equally stark: of roughly 1.1 million girls entering Grade 1, only 99,904 completed primary, and an estimated 20,000 reached Grade 12 (ESA 2016). The geography of exclusion was concentrated. In six provinces, more than 85% of girls were out of school: 98% in Urozgan by 2015, and 85% in Paktika against 33% of boys (Lahire, 2017; Education Cannot Wait, 2018). What, then, was the binding constraint on rural girls' secondary schooling?

The prevailing explanation for this exclusion points to conservative community attitudes and demand-side cultural resistance. Some survey data appear to support this: the Afghanistan Millennium Development Goals report records 'cultural reasons' cited for 34% of non-attendance at primary and 53% at secondary (United Nations Development Programme, 2012). But the same report ranks distance and access second at every level, and as Section 3 shows, this self-reported prioritisation is outweighed by natural-experiment evidence. More significantly, the government itself had already pivoted. As early as 2006, the Afghan National Development Strategy stated that parental demand had 'increased rapidly; the main obstacle is now lack of facilities and staff, rather than social resistance' (Islamic Republic of Afghanistan, 2006). Despite this early signal, the supply side (female-teacher deployment and proximate

provision) has not been examined as the primary obstacle through a province-level quantitative lens. That is the gap this paper fills.

This paper argues that the binding constraint on rural girls' secondary schooling was the supply and deployment of female teachers and proximate secondary schools, not community demand or cultural resistance. The argument proceeds in three moves. First, the system trained female teachers in substantial numbers (42% to 60% of teacher-college graduates) but deployed few, with only some 36% of the workforce being female and roughly 90% concentrated in urban areas, a pipeline-to-classroom gap of 20 to 27 percentage points that never closed (Ministry of Education, 2017; National Statistics and Information Authority, 2020, hereafter NSIA 2019: 70,585 of 196,332). Second, across 34 provinces, female-teacher presence is strongly associated with girls' enrolment, an association that explains over half the cross-provincial variation and is as strong as the government's own reported analysis (Section 3.2). Third, rural secondary exclusion is the predictable outcome of that supply failure, in a setting where demand was demonstrably present, as the AREU recorded in 2016: 'People here will send their girls to school if we had schools for them.'

The reconstruction's shortfalls are documented; what this paper adds is a province-level supply diagnosis with a necessary-condition policy implication. Demand-side instruments (community sensitisation, conditional cash transfers, information campaigns) cannot resolve rural exclusion without the supply precondition: secondary-school construction, female-teacher deployment, and a transition pathway from community-based education to secondary schooling. This challenges the cultural-resistance literature by showing that community demand, far from absent, was articulated but constrained by infrastructure. It extends the fragile- and conflict-affected states (FCAS) and education-in-emergencies literature by indicating that supply failure, not insecurity alone, accounts for the enrolment gap. And it speaks to the economics of education in conflict: returns to schooling in Afghanistan are higher

for women, making this supply failure a measurable human-capital cost with enduring consequences (Najam et al., 2026). These stakes extend to women's education, employment and household food security (Zhu et al., 2024). Crucially, these provinces were already excluded before August 2021: the pattern is structural, not a post-2021 policy artefact. The analysis is cross-sectional, single-country, and documentary.

Section 2 sets out the data and approach; Section 3 presents the pipeline–deployment gap, the provincial association, and the rural-exclusion outcome; Section 4 discusses the mechanism and policy implications; Section 5 concludes.

2. Methods

2.1 Design

This paper reports a documentary, quantitative analysis of educational supply and access indicators for Afghanistan across the 2002–2021 period. The approach is descriptive: it characterises patterns in the data rather than testing pre-specified hypotheses, with the aim of identifying which constraint best accounts for the observed pattern of rural girls' secondary exclusion. The indicators analysed here were compiled as part of a broader programme of research on gender-equality education policy in Afghanistan; this paper draws exclusively on the supply-side quantitative strand relevant to its question.

2.2 Data sources

This paper is built on: (a) the national pipeline-to-deployment series for female teachers, and (b) a 34-province cross-section of female-teacher share against girls' enrolment share. Female share of teacher-college graduates and national deployment figures are drawn from the National Education Strategic Plan III (Ministry of Education, 2017) and the National Statistics

and Information Authority's (2020) Statistical Yearbook 2019–20 (70,585 of 196,332 teachers nationally female, 36%), supplemented by Ministry of Education administrative data. Provincial female-teacher share and girls' enrolment share for the 34-province cross-section are drawn from the National Statistics and Information Authority's (2020) 2019–20 Yearbook. School-life-expectancy, gender-parity-index, and enrolment time-series figures are drawn from UNESCO's statistics institute and the World Bank's development indicators; contextual and corroborating figures are drawn from named sources within the documentary record, including the Ministry of Education's 2016 Education Sector Analysis, the Global Partnership for Education's programme evaluations, GIZ's BEPA evaluation (Samuel Hall, 2014), the STAGES II final reflections, and Education Cannot Wait's multi-year programme data. Figures span 2002–2021; where more than one source reports a comparable statistic, this is noted rather than blended into a single figure.

2.3 The provincial association

The association between provincial female-teacher share and girls' enrolment share was tested in SPSS using bivariate correlation and linear regression across the 34-province cross-section ($N = 34$). The analysis returned $r = .75$, $R^2 = .57$ (linear), $b = 0.43$, $p < .001$; a logarithmic specification, run to mirror the ESA 2016 functional form, returned $R^2 = .57$. Kabul was retained in the primary analysis; a sensitivity run excluding Kabul ($n = 33$) returned $R^2 = .55$ (linear) and $R^2 = .61$ (logarithmic), confirming the association is not driven by the capital. The Ministry of Education's 2016 Education Sector Analysis reports a comparable association: across 35 provinces, a female-to-male teacher ratio plotted against girls'-to-boys' graduation odds returned $R^2 = .47$ (linear) and $R^2 = .57$ (logarithmic), with Kabul City excluded as a high-leverage outlier (ratio 2.97). This paper's cross-section uses a different outcome variable (enrolment share rather than graduation odds), a different sample (Kabul retained rather than

excluded), and an independently compiled dataset; the near-identical fit therefore represents convergent evidence from an independent specification, not a replication of the Ministry's analysis. The association is descriptive and cross-sectional; its causal interpretation, and the threats to that interpretation, are addressed in the Discussion.

2.4 Data reliability and limitations

Administrative education data for Afghanistan carry known reliability limitations, including a documented tendency for enrolment registers to retain non-attending students. Figures reported here are read with this constraint in view, which is one reason the analysis is confined to description rather than precise attainment estimates.

2.5 Ethics, positionality, and AI declaration

The author's prior professional role in Afghan education-sector planning, together with a current position as a researcher based outside the country, informed both familiarity with how these administrative systems functioned in practice and a cautious approach to reported figures. This background is treated here as a source of contextual and interpretive advantage rather than as a source of bias requiring correction. All data used in this study are drawn from publicly available secondary sources and published aggregate statistics. No individuals were contacted, sampled, or identified in the course of this research, and no primary data were collected. Formal ethical review was accordingly not required. Given the sensitivity of the wider context, sources are treated with due care and are cited without reference to any individually identifying detail. The limited use of generative AI has been disclosed in the manuscript's Declarations section. AI use was confined to mechanical tasks (reference formatting, language polishing, and structural planning) and did not influence data analysis, interpretation, or argumentation.

3. Results

3.1 The pipeline-to-deployment disconnect

Women constituted 42% to 60% of teacher-college graduates across the reconstruction period. The National Education Strategic Plan III recorded that by 2017 women accounted for over 60% of teacher-college graduates. The training pipeline was not the constraint; entry into teacher training functioned. The question the paper turns to next is what happened between graduation and deployment.

As of the 2019-20 Statistical Yearbook, women constituted 36% of the national teaching workforce (70,585 of 196,332 teachers). Deployment ranged from roughly 29% to 36% of the workforce across the reconstruction period, with no sustained upward trend. Approximately 90% of qualified female teachers were concentrated in nine urban centres. The resulting pipeline-to-deployment gap ran 20 to 27 percentage points, present in every sub-period of the reconstruction and never closed.

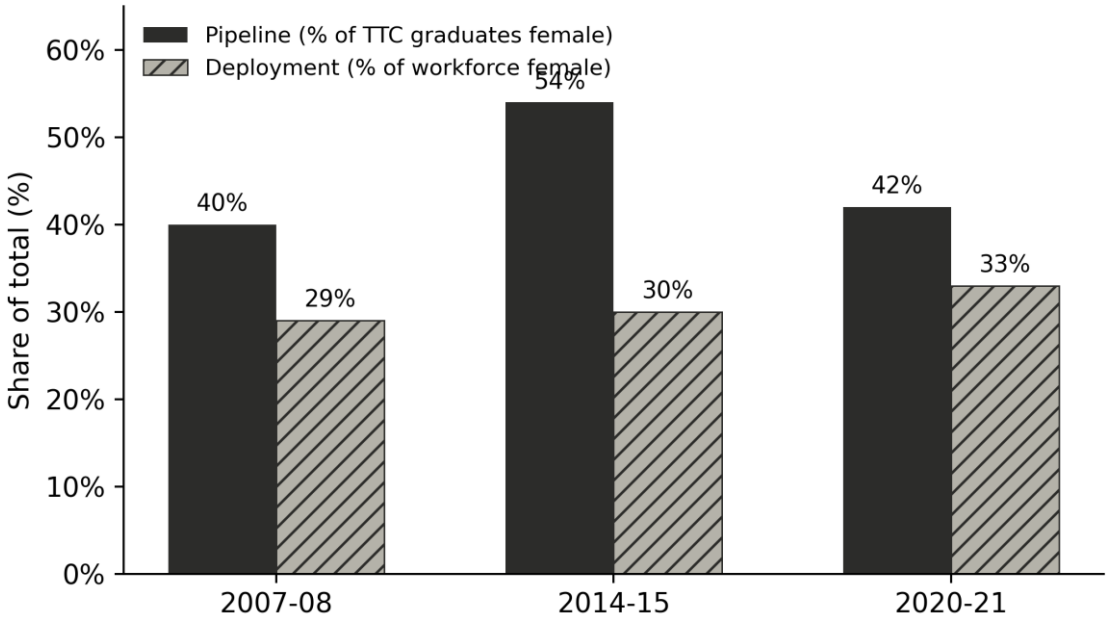


Figure 1. Female-teacher pipeline versus deployment share, selected years (Ministry of Education, 2017; UNICEF Afghanistan, 2018; Ministry of Education, 2021).

At the provincial level, female-teacher share ranged from 66% in Kabul to 1% in Paktika, a 65-percentage-point spread. Five provinces recorded a female-teacher share under 8%: Paktika (1%), Khost (4%), and Urozgan, Zabul, and Paktya (7% each). The government's 2008 national development strategy (Islamic Republic of Afghanistan, 2008) conceded that '80% of rural districts do not have a girls' high school because there are no female teachers available locally.'

An estimated 60% of female teacher-college graduates were unable to obtain a post because they could not pay the required bribe; female in-service training reached only 17% of its target, against 44% for men. At the 2009 security peak, 200 of 415 districts had no female teacher at all (Special Inspector General for Afghanistan Reconstruction, 2021), a rational response to risk by families and by the women themselves, not an expression of values. National policy required rural postings to be filled only by teachers relocated with a mahram, a policy design that made rural deployment structurally difficult for unmarried women; this constraint is cited by the Global Partnership for Education as a driver of the 90% urban concentration. 29% of the country's 415 education districts had no designated girls' school at all, and 245 of the 412 districts had no qualified female teacher, a circular dependency in which the absence of a school forecloses the posting of a teacher, and the absence of a teacher forecloses the building of a school.

Table 1. Structural barriers to female-teacher deployment

Barrier	Mechanism	Decisive evidence	Source
Corruption in appointments	Posts required an unofficial payment graduates could not always afford	60% of female teacher-college graduates unable to obtain a post without payment; female in-service training reached 17% of target vs 44% for men	Bakhshi et al., 2020
Security	Family and teacher risk-aversion in insecure districts	200 of 415 districts had zero female teachers at the 2009 security peak	Special Inspector General for Afghanistan Reconstruction, 2021
Mahram relocation policy	Rural postings required relocation with a mahram, structurally excluding unmarried women	Cited as a driver of the 90% urban concentration of qualified female teachers	Ministry of Education, 2006; UNICEF Afghanistan, 2018

Infrastructure / circular dependency	Absence of a school forecloses a posting; absence of a teacher forecloses school construction	29% of 415 districts had no designated girls' school; 245 of 412 districts had no qualified female teacher	Ministry of Women Affairs, 2008; UNICEF Afghanistan, 2018

The pipeline delivered graduates in growing numbers; the deployment architecture did not deliver them to where rural girls needed them.

3.2 The provincial association

The Ministry of Education's 2016 Education Sector Analysis plotted the female-to-male teacher ratio against girls'-to-boys' graduation odds across 35 provinces. The analysis documents that in 21 of the 35 provinces, girls' graduation probability was 20% or more below boys' (OR < 0.8); in five provinces (Balkh, Faryab, Ghazni, Herat, Kabul City) girls outperformed boys. The Ministry's analysis returned $R^2 = .47$ (linear) and $R^2 = .57$ (logarithmic), with Kabul City excluded as a high-leverage outlier (ratio 2.97).

As described in Section 2.3, the association between provincial female-teacher share and girls' enrolment share was tested in SPSS using bivariate correlation and linear regression across the 34-province cross-section (N = 34). The analysis returned $r = .75$, $R^2 = .57$ (linear), $R^2 = .57$ (logarithmic), $b = 0.43$, $p < .001$. Kabul was retained in the primary analysis; a sensitivity run excluding Kabul (n = 33) returned $R^2 = .55$ (linear) and $R^2 = .61$ (logarithmic), confirming the association is not driven by the capital. This paper's cross-section uses a different outcome variable (enrolment share rather than graduation odds), a different sample (Kabul retained rather than excluded), and an independently compiled dataset; the near-identical fit therefore represents convergent evidence from an independent specification, not a replication of the Ministry's analysis.

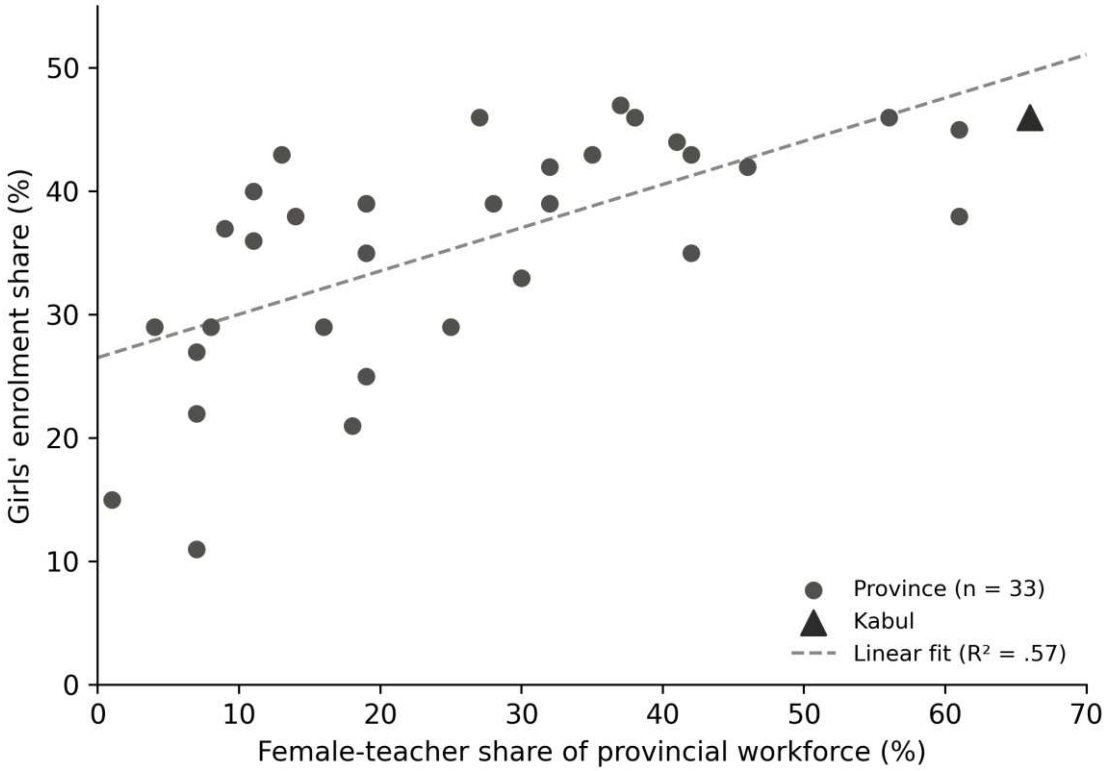


Figure 2. Provincial female-teacher share and girls' enrolment share, 34 Afghan provinces, 2019 (National Statistics and Information Authority, 2020; author's construction). r = .75, R^2 = .57, b = 0.43, p < .001, N = 34.

90% of qualified female teachers were concentrated in nine urban centres, while 245 of 412 districts had no qualified female teacher at all. The scale implication is clear: 245 districts carried a structurally predicted deficit in girls' outcomes, resolvable only through female-teacher deployment. UNESCO's Global Education Monitoring report identifies the same mechanism: 'few female... teachers in many parts of the country leads to poor enrolment and attendance rates for girls.' A bilateral donor's own portfolio review reported a related finding at project level, that female teachers outperformed male teachers where deployed (USAID, 2017).

This association is cross-sectional, province-aggregate, and drawn in part from a secondary source; it is a strong association consistent with a supply mechanism, not an estimated causal effect. The full causal-inference discussion, including endogeneity, omitted variables, and ecological inference, is addressed in Section 4.

3.3 Rural exclusion as a supply outcome

The gender-parity index cascades sharply by level and location: national primary 0.74, national secondary 0.49, rural upper-secondary 0.14. The Southern region recorded a secondary GPI of 0.16. The signature is a system that expanded primary access without building secondary capacity.

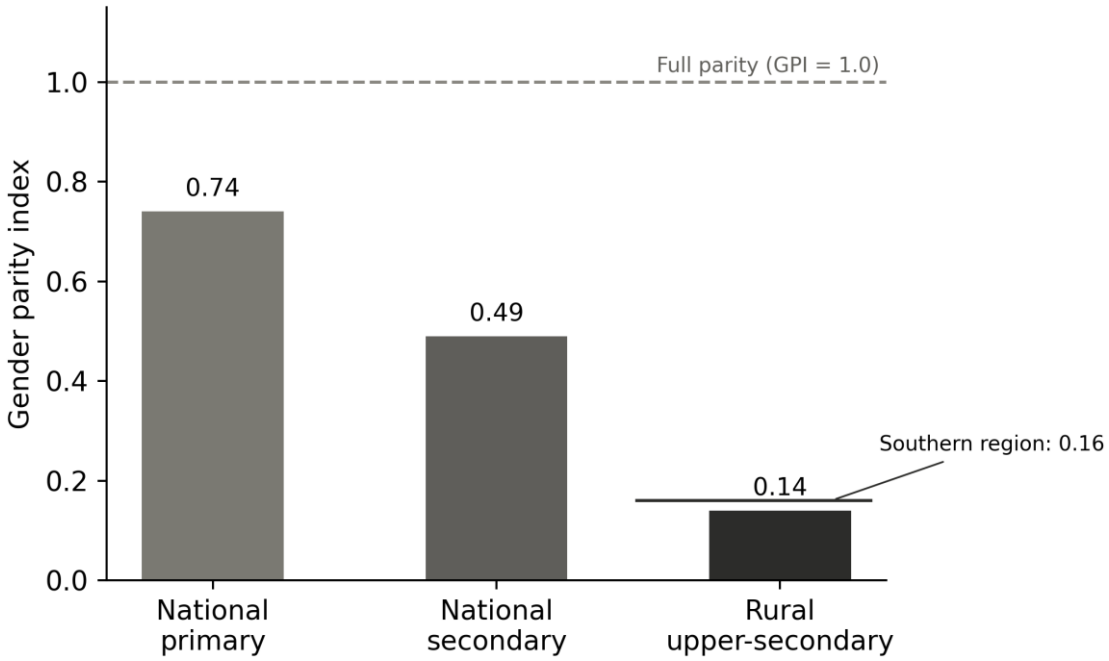


Figure 3. Gender parity index by education level and location (Ministry of Education, 2010, Table 2; Pouras Consult ApS, 2016). Dashed line marks full parity (GPI = 1.0); marker shows the Southern region secondary figure as a regional extreme.

School-life expectancy for a rural girl was 4.3 years, compared with 8.5 years for a rural boy and 9.6 years nationally. Six provinces recorded girls' out-of-school rates above 85%, including Urozgan at 98% (2015) and Paktika at 85% against a boys' rate of 33%.

Distance elasticity compounds the supply deficit: each additional mile from home is associated with a 19% decline in girls' enrolment. Community-based education (CBE), the primary mechanism designed to reach remote populations, was capped at Grade 6, with no built-in secondary transition. The investment architecture thus foreclosed the possibility of progression for girls in the very locations where they were most dependent on it.

The evidence that demand for girls' education was present, and that distance rather than culture was the binding constraint, is empirical and testable. When CBE classes were available locally, girls attended at rates matching or exceeding boys; when the same classes moved to hub schools three or more kilometres away, girls dropped out while boys largely continued. The same families and the same communities were involved; distance was the variable. STAGES II documented comparable learning gains regardless of delivery modality: girls' literacy scores rose from 33.4 to 61.3 in community-based education and from 33.8 to 61.6 in government schools, indicating that community-based provision delivered learning outcomes on par with formal schooling. The Asia Foundation found that 91.5% of Afghans supported equal access to education for girls and boys in 2006; support fell below 50% only when travel outside the province was required.

The credibility of this interpretation is reinforced by engaging the counter-evidence directly. The Afghanistan Millennium Development Goals report (United Nations Development Programme, 2012) recorded that girls' non-attendance was attributed to 'cultural reasons' by 34% at primary level and 53% at secondary level; the same report ranked distance and access as the second most-cited reason at every level. Self-reported reasons and natural-experiment evidence, however, diverge. The natural experiment, in which the same families varied only in distance to school, is the more decisive test, because self-report is confounded by post-hoc rationalisation and social-desirability response, whereas revealed behaviour under controlled variation is not. The constraint was supply, not demand.

The pipeline-deployment gap and the rural-access outcome are distinct but causally linked; resolving the supply deficit is a necessary condition for rural girls' secondary inclusion.

4. Discussion

The pipeline-deployment gap, the province-level association, the within-community CBE evidence, and the demand data together point to supply as the binding constraint on rural girls' secondary schooling. No single strand is decisive in isolation, but four independent lines of evidence (administrative, cross-sectional, quasi-experimental, and attitudinal) align on the same diagnosis. The government's own data show a 20- to 27-percentage-point pipeline-to-classroom gap, with 42% to 60% of teacher-college graduates trained but only some 36% deployed and roughly 90% concentrated in urban areas. The province-level association ($R^2 \approx .57$) is robust to excluding Kabul ($R^2 = .55$, $n = 33$). The CBE evidence points the same way, with attendance tracking proximity within the same communities. STAGES II adds further weight, showing near-identical learning gains regardless of delivery modality (community-based education: 33.4 to 61.3; government schools: 33.8 to 61.6, among the same largely female cohort). The case is consistent with and best explained by a supply diagnosis; it does not logically exclude every alternative, but the alternatives do not account for the convergence. Female-teacher deployment and proximate provision are where the evidence concentrates.

The province-level association is cross-sectional, single-year, and aggregate; it cannot by itself establish causation. Three threats are immediate. First, endogeneity or reverse causation: provinces where girls' demand or attainment is already higher may attract and retain female teachers, so causation could run the other way. Second, omitted variables: security, urbanity, household income, and road access co-vary with both female-teacher supply and girls' enrolment, and could drive both. Third, ecological inference: province aggregates do not license claims about individual girls; the relationship at the provincial level need not hold at the household level. Yet the supply claim does not rest on the cross-sectional R^2. It rests on convergent evidence that the threats do not explain. The CBE natural experiment holds community and family constant (the same families enrol when proximate and withdraw when distant), which addresses omitted-variable and reverse-causation concerns directly. The 245

districts with no qualified female teacher are a supply fact, not an outcome of demand. STAGES II shows these girls achieve comparable learning outcomes whether taught through community-based or government schooling, evidence against a differential-ability explanation for the enrolment gap. Najam et al. (2026) use instrumental-variables methods on returns to schooling; they are cited here to establish the stakes and the broader human-capital logic, not to import their causal identification. The evidence supports supply as the binding constraint to a degree that demand-side explanations cannot match, while falling short of experimental proof.

The 'cultural intractability' account is, in substantial part, an artefact of supply decisions, not a property of communities. Demand-side instruments (sensitisation, conditional cash transfers, information campaigns) cannot resolve rural girls' secondary exclusion without the supply precondition: secondary-school construction, female-teacher deployment, and a CBE-to-secondary transition pathway. Where supply was provided (proximate CBE centres, deployed female teachers), girls attended and learned; where it was withheld, they did not, regardless of stated demand. The Afghan National Development Strategy had already identified facilities and staff, not demand, as the binding obstacle in 2006; that diagnosis anticipated a constraint that remained unfunded. The GPE Strategy 3 illustration is telling: USD 108,000 was budgeted to train adolescent girls as local teachers, the mechanism that would have created female teachers in the communities that lacked them, and USD 0 was spent. Because returns to schooling are higher for women in Afghanistan (Najam et al., 2026), the supply failure carries a measurable and compounding human-capital cost, one that extends to household food security and employment (Zhu et al., 2024). The mechanism (female educators as a precondition for girls' progression in conservative or insecure settings) is plausibly relevant to other fragile and conflict-affected states, but this is an empirical question for those settings, not

a deduction from one country. The implication is not that demand-side work is useless, but that it is insufficient alone and mis-sequenced when supply is the key constraint.

The administrative series carry the self-documented MoE roll-retention problem; all figures are read within that constraint, which is why the analysis stays descriptive rather than asserting precise attainment levels. The design is single-sector, single-country, and cross-sectional; the headline R^2 association is reproduced from a secondary source (the MoE's own analysis) and contextualised, with the independent scatter as corroboration rather than a new identification. The within-individual mechanism (why a given girl stays once a female teacher is present) is inferred from convergent evidence, not directly measured here. Extension to other fragile and conflict-affected states requires testing, not assumption; panel or longitudinal supply data, and household-level study, would test what this cross-section can only associate.

5. Conclusion

The binding constraint on rural girls' secondary schooling in Afghanistan across the reconstruction period was supply, not demand. The pipeline delivered graduates in growing numbers, yet deployment architecture failed to deliver them to where rural girls needed them: a 20-to-27-percentage-point gap persisted throughout, with 90% of qualified female teachers concentrated in nine urban centres. At the provincial level, female-teacher share and girls' enrolment share returned a near-identical association in this paper's independently compiled dataset ($R^2 = .57$) as in the Ministry of Education's 2016 logarithmic analysis ($R^2 = .57$), convergent evidence from a different outcome variable, different sample, and different specification. Rural exclusion was the outcome: the gender-parity index cascaded from 0.74 at national primary to 0.14 at rural upper-secondary, while the Asia Foundation documented 91.5% support for equal access, STAGES II recorded comparable learning gains across delivery modes, and the CBE natural experiment showed that girls attended at rates matching

or exceeding boys when classes were local but dropped out when the same classes moved three or more kilometres away. Demand was present; supply was withheld. Demand-side instruments cannot substitute for supply where supply is the binding constraint.

The contribution of this paper is a province-level supply diagnosis of rural girls' secondary exclusion, not a claim about individual causation. Further research extending this analysis would require panel or longitudinal supply data, household-level study of enrolment decisions, or testing the mechanism in other fragile and conflict-affected settings. The evidence from Afghanistan points to a single imperative: rural girls' secondary inclusion requires the deployment of female teachers to the districts where they are needed, because without supply, demand cannot be realised.

Notes

Not applicable. No explanatory notes are required beyond the citations and disclosures provided in the Methods and Declarations.

Declarations

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Data availability

This study draws exclusively on publicly available secondary sources and published aggregate statistics, as detailed in Section 2.2. No new data were generated. The province-level dataset compiled by the author for the cross-sectional analysis in Section 3.2 is available from the corresponding author on reasonable request.

Ethics declarations

See Section 2.5.

Generative-AI use declaration

Limited, disclosed generative-AI assistance was used in the preparation of this manuscript, confined to administrative and verification tasks that do not bear on the paper's scientific content: structural planning and journal formatting compliance (e.g., section word budgets

and style checks), verification of citation accuracy and formatting, and checking author-written text for argumentative coherence and potential weaknesses—identifying areas the author then independently revised. This use was adopted to improve efficiency in independently preparing three related manuscripts from a single doctoral thesis without institutional research-assistant support. The AI tool was not used to conduct data analysis, generate findings, or draft original analytical, interpretive, or theoretical content at any stage. All data analysis was performed by the author using SPSS. All interpretation, argumentation, and scholarly claims in this manuscript are the author's own.

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