

Do Remittances Reduce Gender Inequality? Evidence from Nepal



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Abstract: This study examines the impact of remittance inflows on gender inequality in Nepal using annual time-series data from 1990 to 2023. Despite being one of the world's most remittance-dependent economies, Nepal continues to experience persistent gender disparities in education, labor-market participation, and empowerment. This context highlights the need to empirically assess whether remittance inflows contribute to reducing gender inequality in Nepal. The study employs the autoregressive distributed lag (ARDL) approach to estimate the short-run and long-run relationships between remittance inflows and gender inequality. The empirical results reveal that remittance inflows have a statistically significant effect on reducing gender inequality in both the short and long run. However, the magnitude of the estimated coefficient indicates that remittances alone are unlikely to generate substantial improvements in gender equality without complementary institutional and labor-market reforms. These findings highlight the importance of complementary institutional and labor-market policies. Accordingly, policymakers should expand women's access to formal employment, skills development, and decision-making opportunities to enhance the contribution of remittances to gender equality.

Keywords: remittances; gender inequality; ARDL method; labor migration; Nepal.

JEL Classification: F24; J16; C32; J61.

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Introduction

Gender inequality persists as a major form of social exclusion across the globe, particularly in developing economies. This study addresses the persistent challenge of gender inequality in Nepal, where disparities in education, employment, and empowerment remain noticeable. It aligns closely with Sustainable Development Goal 5 by assessing whether remittance inflows translate into measurable improvements in gender equality at the national level (Conceicao, 2024). In this context, the role of international migration and migrant remittances has attracted growing scholarly attention. In particular, researchers emphasize their potential to affect intra-household relations, women's empowerment, and broader gender-related development outcomes (Azizi, 2018).

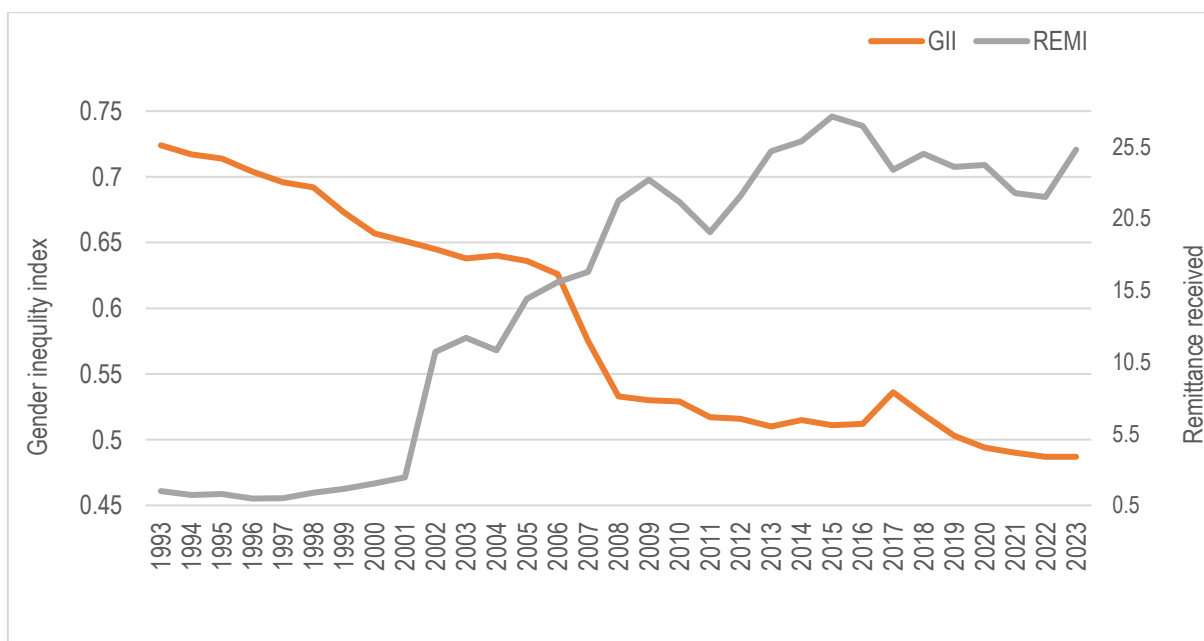
Remittances can reduce gender inequality through multiple transmission channels operating at the household level. By improving access to financial resources, remittance income enables greater investment in girls' education and women's health, thereby improving human capital accumulation and long-term economic participation. Recent empirical evidence supports these mechanisms, showing that remittance inflows contribute to improved gender-related outcomes through education, health expenditure, and female empowerment in developing economies (Abokyi, 2023). Their findings show that this effect is particularly strong in African and Latin American regions, where remittances advance women's involvement in health, education, and employment. However, they also acknowledge substantial heterogeneity across regions. For instance, in South Asia, including Nepal,

remittances do not significantly reduce gender disparities, which may reflect the persistence of patriarchal norms and limited absorptive capacity for social transformation (Barkat *et al.*, 2026).

Nepal remittances have consistently contributed over one-fourth of Nepal's GDP, placing the country among the top remittance-receiving nations globally in proportion to its economy (World Bank, 2024). However, despite this significant financial inflow, Nepal continues to experience deeply entrenched gender inequalities, as reflected in low female labor participation, unequal access to education and healthcare, and limited representation in decision-making institutions (UNDP, 2024a; Parajuli and Neupane, 2025). Hence, it provides a compelling case for analyzing the gender effects of remittance inflows.

In Nepal, micro-level evidence suggests that remittances can both empower women and reinforce traditional norms, depending on household structure, caste, education level, and the gender of the migrant (Chapagai, 2024). Yet there remains a gap in the macroeconomic time-series analytical examination of how remittance inflows systematically influence gender inequality indicators at the national level over time. This study fills an important gap in the literature by employing a time-series econometric approach to examine the long-run and short-run effects of remittance inflows on Nepal's Gender Inequality Index (GII) over the period 1990 - 2023.

Figure 1. Gender Inequality and Remittance Inflow in Nepal



Source: Author's own figure based on data drawn from World Development Indicators, World Bank (2025)

Figure 1 illustrates the contrasting trends of the gender inequality index (GII) and remittance inflows (REMI) in Nepal over the period 1993 - 2023. The Gender Inequality Index shows a steady decline over time, indicating gradual improvements in gender-related outcomes. In contrast, remittance inflows exhibit a pronounced upward trend, particularly after the early 2000s, reflecting their growing importance in the national economy. The opposite movement of the two series suggests a potential inverse nexus between remittances and gender inequality, which is further examined through econometric analysis in the study.

This research advances the literature through three main contributions. First, it emphasizes Nepal, a country largely underrepresented in cross-national econometric analyses despite its heavy dependence on labor migration. Second, it utilizes the UNDP's Gender Inequality Index, a multidimensional composite measure that captures inequality in reproductive health, empowerment, and labor market participation, as the dependent variable, in line with recent methodological advancements (Barkat *et al.*, 2026; Le Caous and Huarng, 2020). Third, it incorporates robust time-series techniques to investigate the causal and dynamic relationship between remittances and gender inequality within a single-country framework. In doing so, this study provides empirical insights relevant to both academic researchers and policymakers aiming to leverage migration and remittance flows as tools for gender-equitable development in Nepal.

1. Literature Review

The theoretical basis for the gender impact of remittances is often built on the New Economics of Labor Migration (NELM), which exhibits migration as a household strategy for diversifying income and reducing risk (Stark and Levhari, 1982). When male members migrate and send remittances home, women left behind may gain increased decision-making power, mobility, and access to financial resources, potentially leading to greater autonomy and a narrowing of gender gaps (Chaudhary, 2022; Hadi, 2001; Lei and Desai, 2021). On the contrary, some scholars caution that remittances may entrench existing gender roles by increasing women's domestic burdens while discouraging their labor market participation (Funkhouser, 1992).

Remittances can influence gender inequality through distinct household-level and macro-level channels that operate at different scales and mechanisms. At the household level, remittances may directly alter intra-household resource allocation, bargaining power, and decision-making, potentially enhancing women's autonomy and welfare when women control or receive transfers, which can improve education, health, and financial inclusion outcomes for female household members (Abokyi, 2023). In contrast, macro-level channels reflect economy-wide effects of aggregate remittance inflows, such as increased national income, greater fiscal space for social services, structural transformation, and shifts in labor markets that indirectly affect gender gaps measured by national indices like the Gender Inequality Index. For example, recent macro-econometric evidence suggests that international remittances may have a nonlinear relationship with gender inequality at the country level, implying complex aggregate dynamics that can either reduce or attenuate gender disparities depending on the remittance threshold and institutional context (Akçay, 2025).

However, the relationship is not linear or universally positive. Feminist critiques argue that remittances may reinforce patriarchal norms, particularly when women's increased responsibilities are not matched by enhanced rights or recognition (Rahman and Fee, 2009). In such cases, remittances may alleviate material poverty without addressing deeper structural inequalities.

Recent cross-country empirical studies have produced mixed findings regarding the consequences of remittances for gender inequality. For example, Barkat, Karim *et al.* (2026) analyzed panel data for 111 developing countries covering the period 2000-2021 and found that international remittances significantly reduce gender inequality. Using System GMM and Lewbel instrumental variable estimators to address endogeneity, the authors further showed that improvements in women's education, health, and income constitute important channels through which remittances promote gender equality. The results also indicate that the gender-equality effects of remittances are stronger in low-income and low-human-development countries than in relatively more developed economies.

Azizi (2018) also finds that remittances positively influence women's employment participation along with human capital investment in developing nations. However, the effects are stronger when remittances are received by women themselves, highlighting the importance of gendered remittance flows. Le Caous and Huarng (2020) extended the discussion by incorporating economic complexity and inequality, arguing that remittances reduce inequality more effectively when accompanied by institutional development and financial inclusion. Onyina *et al.* (2025), focusing on Africa, found that remittances strengthen gender equality only in countries with higher levels of female education and autonomy, suggesting that pre-existing social structures moderate the effect. Beyond their implications for gender outcomes, remittances have also contributed to Nepal's economic performance by providing foreign exchange earnings and supporting small-scale businesses (Shakya and Gonpu, 2021). However, evidence suggests that remittances may adversely affect short-term economic growth through Dutch disease effects and increasing foreign dependency (Gurung *et al.*, 2026). Moreover, remittances often function as a household survival mechanism rather than a catalyst for long-term socioeconomic transformation (Shah and Subedi, 2025).

While most global studies provide important insights, few address South Asia, and even fewer focus specifically on Nepal. Those that highlight a complex, context-dependent relationship. Chaudhary (2022), using household-level qualitative data from Pokhara, Nepal, concludes that remittances shift economic power to women and challenge traditional gender norms, particularly in households where male members have migrated abroad. Chapagai (2024) studied 200 households in Tanahun District and found that remittances were correlated with improvements in terms of women's education access, mobility, and household decision-making. However, the author also notes that empowerment was often limited to economic dimensions, while political and legal empowerment remained unchanged.

Although a growing body of studies examines the relationship between remittances and gender inequality, several critical gaps persist. First, most studies focusing on Nepal are either cross-sectional or qualitative in nature, limiting their ability to capture long-run dynamics and temporal variations in the relationship. Second, there is a lack of macroeconomic-level analyses that explore how remittance inflows influence national indicators of gender

inequality, such as the Gender Inequality Index (GII). Third, only a few existing studies adequately address issues of endogeneity, particularly reverse causality and omitted variable bias, which may distort the estimated relationship between remittances and inequality. Finally, although Nepal ranks among the most remittance-dependent economies globally, there is a notable absence of data-rich, single-country econometric studies employing national time-series data to examine gender-related impacts.

To address these gaps, this study employs a time-series econometric framework to examine the dynamic relationship between remittance inflows and gender inequality in Nepal over the period 1990 - 2023. The analysis includes an array of economic, social, and demographic controls to provide a more nuanced understanding of the long-term dynamics between remittances and gender inequality at the national level.

2. Research Methodology

This study uses annual time-series data from 1990 to 2023 to examine the relationship between remittance inflows and gender inequality in Nepal. The data are obtained from the United Nations Development Programme (UNDP), the World Development Indicators (WDI) database, and the Worldwide Governance Indicators (WGI) database of the World Bank. The main dependent variable is the Gender Inequality Index (GII), published by the United Nations Development Programme (UNDP), which measures inequalities in reproductive health, empowerment, and labor force participation. The main explanatory variable is remittance inflows (REMI), measured as a percentage of GDP using data from the World Development Indicators (WDI) database.

This study incorporates several control variables to isolate the effect of remittance inflows on gender inequality. GDP per capita (PGDP) is incorporated to capture the level of economic development, as higher income levels may improve women's access to education, healthcare, and employment opportunities, thereby narrowing gender disparities (Duflo, 2012). Inflation (INF) is included to account for macroeconomic instability, which may disproportionately affect women by reducing household purchasing power and limiting access to essential goods and services (Seguino, 2010). Government expenditure on education (EDUE) is used as a proxy for public investment in human capital because increased educational investment enhances women's educational attainment, skills, and labor market participation, contributing to lower gender inequality (Tokal *et al.*, 2023). Female employment in agriculture (FEMAG) is incorporated to capture the structural composition of women's employment, as a higher concentration of women in low-productivity agricultural activities is often associated with persistent gender inequality and limited economic empowerment (Food and Agriculture Organization [FAO], 2011). The inclusion of these control variables minimizes omitted-variable bias and enables a more reliable estimation of the relationship between remittance inflows and gender inequality.

Based on the theoretical framework and the selected variables, the ARDL model is specified as follows:

$$GII_t = \beta_0 + \beta_1 REMI_t + \beta_2 \ln(PGDP_t) + \beta_3 INF_t + \beta_4 EDUE_t + \beta_5 FEMAG_t + \varepsilon_t \quad (1)$$

$$\begin{aligned} \Delta GII_t = & \sum_{i=1}^p \alpha_1 \Delta GII_{t-i} + \sum_{i=0}^{q1} \alpha_2 \Delta REMI_{t-i} + \sum_{i=0}^{q2} \alpha_3 \Delta \ln(PGDP_{t-i}) + \sum_{i=0}^{q3} \alpha_4 \Delta INF_{t-i} + \\ & \sum_{i=0}^{q4} \alpha_5 \Delta EDUE_{t-i} + \sum_{i=0}^{q5} \alpha_6 \Delta FEMAG_{t-i} + \lambda(GII_{t-1} - \theta_1 REMI_{t-1} - \theta_2 \ln(PGDP_{t-1}) - \\ & \theta_3 INF_{t-1} - \theta_4 EDUE_{t-1} - \theta_5 FEMAG_{t-1}) + \mu_t \end{aligned} \quad (2)$$

where GII: Gender Inequality Index, REMI: Remittance inflows, PGDP: Per capita income, INF: Inflation rate, EDUE: Education expenditure, AGRIE: Female agricultural employment, ε and μ are error terms. $p, q1, \dots, q5$ are selected automatically by AIC. Long-run coefficients ($\theta_1, \dots, \theta_5$) are derived from the estimated ARDL. GDP per capita is log-transformed to reflect proportional income changes and improve statistical properties, while other variables are kept at levels as they are ratio-based or bounded measures. Remittances, education expenditure, and female employment in agriculture are introduced with lagged values because their effects on gender inequality are inherently delayed and may be subject to simultaneity. In contrast, GDP per capita and inflation are entered contemporaneously, as they capture current macroeconomic conditions and structural characteristics that influence gender inequality in the same period. Income levels reflect immediate economic capacity, and inflation represents short-run price pressures affecting household welfare. This differentiated lag structure ensures a parsimonious and theoretically consistent time-series specification. The summary of variables is presented in Table 1.

This study uses the ARDL modeling approach, as it is particularly suited to a single-country time-series analysis when the sample size is relatively small. The ARDL framework allows the inclusion of variables integrated of different orders, $I(0)$ and $I(1)$, without requiring that all series are of the same order of integration, thus steering clear of the limitations of the conventional cointegration techniques. Moreover, the ARDL bounds testing procedure provides a robust method for identifying long-run relationships, while its error-correction representation captures short-run dynamics and the speed of adjustment toward long-run equilibrium following short-term shocks (Pesaran

and Shin, 1995; Pesaran, Shin, and Smith, 2001). Given the limited number of observations and the mixed integration properties of the variables, the ARDL approach is particularly appropriate for analyzing the dynamic relationship between remittances and gender inequality in Nepal (Narayan, 2005).

Table 1. Variable Summary

Variable	Description	Source
GII	Gender Inequality Index (value)	HDR, UNDP
REMI	Remittances received (% of GDP)	WDI, World Bank
PGDP	GDP per capita (constant 2015 US\$)	WDI, World Bank
INF	Inflation rate (consumer prices, annual %)	WDI, World Bank
EDUE	Government expenditure on education (% of GDP)	WDI, World Bank
FEMAG	Female employment in agriculture (% of female employment)	WDI, World Bank

Note: The HDR and WDI refer to the Human Development Report and World Development Indicators, respectively. The data can be downloaded from <https://hdr.undp.org> and <https://databank.worldbank.org>.

Although the ARDL framework mitigates omitted dynamic specification bias and accommodates variables integrated of different orders, it does not completely eliminate potential endogeneity arising from reverse causality between remittances and gender inequality. Improvements in gender equality may themselves influence migration decisions and remittance behaviour. Therefore, the estimated coefficients should be interpreted as long-run associations rather than definitive causal effects. Future research could employ instrumental-variable techniques or other identification strategies to better address potential endogeneity and establish stronger causal relationships between remittance inflows and gender inequality.

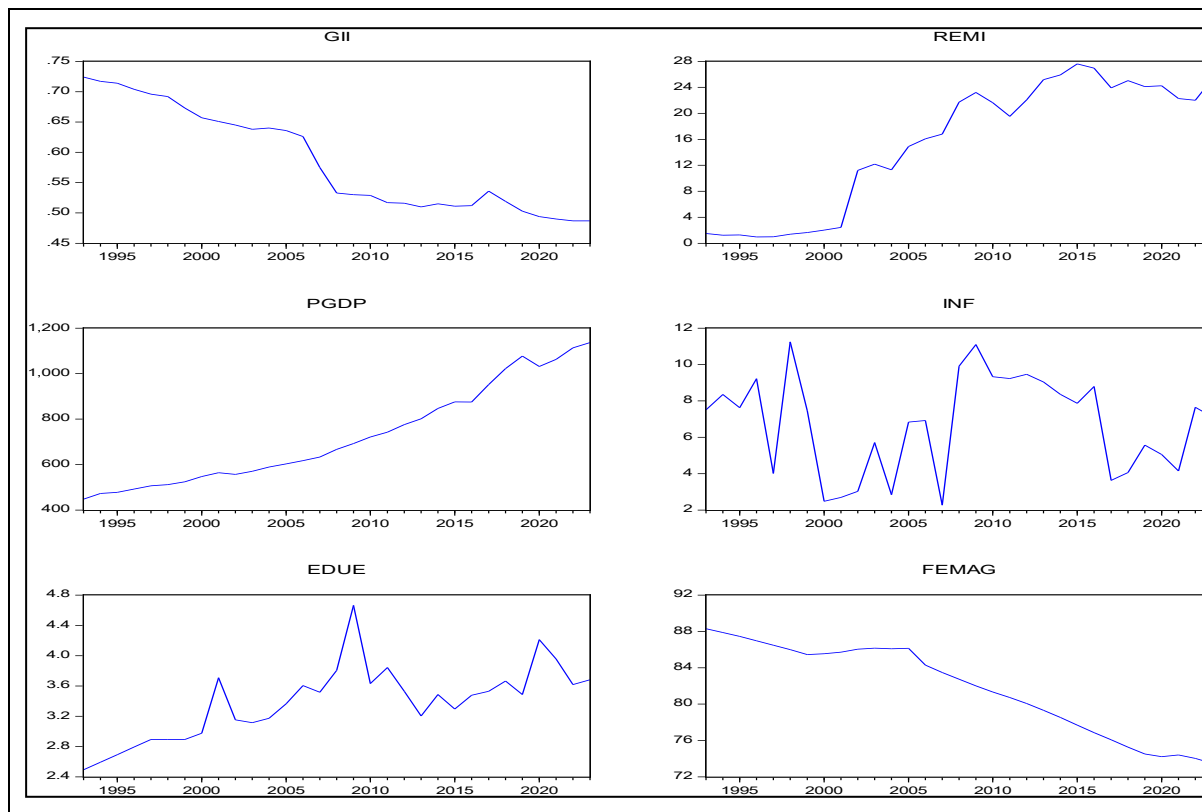
Table 2. Descriptive Statistics

	Mean	Median	Std. Dev.	Max	Min	Jarq.-Bera	Prob.
GII	0.59	0.54	0.08	0.72	0.49	3.50	0.17
REMI	15.38	19.55	9.98	27.63	0.98	3.71	0.16
PGDP	726	667	217	1136	448	2.95	0.23
INF	6.73	7.45	2.67	11.24	2.27	1.88	0.39
EDUE	3.39	3.49	0.48	4.66	2.49	0.47	0.79
FEMAG	81.72	82.74	4.96	88.30	73.47	3.07	0.22

Note: The gender inequality index (GII) value, 0 indicates complete equality, while 1 shows complete inequality.

Table 2 reports the descriptive statistics of the variables used in the analysis. The Gender Inequality Index exhibits moderate variation over the sample period, reflecting a gradual improvement in gender-related outcomes in Nepal. Remittances as a share of GDP show substantial dispersion, highlighting their growing macroeconomic importance. GDP per capita displays a steady upward trend with noticeable variability, indicating changes in income levels over time. Inflation remains relatively volatile, capturing periods of price instability. Education expenditure and female employment in agriculture also show meaningful variation, suggesting structural changes in public investment and women's employment patterns during the study period.

Figure 2. Graphical Presentation of Variables (1993-2023)



Source: Author's own figure based on data drawn from World Development Indicators, World Bank (2025)

Figure 2 presents the time-series evolution of the key variables over the period 1993–2023. Gender inequality shows a clear declining trajectory, indicating gradual improvements in gender-related outcomes in Nepal. Remittances as a share of GDP rise markedly over time, underscoring their increasing role in the economy. GDP per capita follows an upward path, reflecting long-term income growth, while inflation exhibits noticeable short-run fluctuations. Education expenditure displays moderate variation with a generally stable trend, whereas female employment in agriculture declines steadily, suggesting ongoing structural transformation in women's employment.

3. Result and Discussion

Table 3. Unit-root test

Variable	Augmented Dickey-Fuller (ADF)				Phillips-Perron (PP)			
	Intercept		Intercept and Trend		Intercept		Intercept and Trend	
	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.	Level	1st Diff.
GII	-1.26 (0.63)	-3.62** (0.01)	-1.84 (0.66)	-3.88 (0.03)	-1.18 (0.67)	-3.48** (0.02)	-1.08 (0.92)	-3.41* (0.07)
REMI	-1.02 (0.73)	-4.77*** (0.00)	-1.27 (0.88)	-4.35 (0.01)	-1.02 (0.73)	-4.77*** (0.00)	-1.35 (0.86)	-4.71*** (0.00)
LPGDP	0.41 (0.98)	-4.92*** (0.00)	-1.88 (0.64)	-5.03 (0.00)	1.60 (1.00)	-5.40*** (0.00)	-1.75 (0.70)	-8.70*** (0.00)
INF	-3.26** (0.03)	-6.11*** (0.00)	-3.65 (0.04)	-6.00 (0.00)	-3.79*** (0.01)	-8.03*** (0.00)	-3.72** (0.04)	-7.90*** (0.00)
EDUE	-2.69** (0.09)	-7.91*** (0.00)	-3.43* (0.07)	-7.89** (0.00)	-2.55 (0.11)	-8.37*** (0.00)	-3.39* (0.07)	-8.52*** (0.00)
FEMAG	0.26 (0.97)	-3.17** (0.03)	-2.16 (0.49)	-3.22* (0.09)	0.46 (0.98)	-3.18** (0.03)	-1.62 (0.76)	-3.88** (0.03)

Note: p-values are provided in parentheses. *, **, *** significant at 10%, 5%, and 1% respectively.

Table 3 summarizes the results of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit-root tests conducted to evaluate the stationarity properties of the variables. The results indicate that the series are integrated of mixed orders, with some variables being stationary at levels while others become stationary after first differencing. Significantly, none of the series follows an integrated process of order two, thus meeting the necessary condition to use the bounds testing procedure based on the ARDL model. This finding also supports the use of the ARDL model in examining both the short-run and long-run relationships between the variables.

Table 4. Bound Test

	Value	Significant Level	Lower Bound I(0)	Upper Bound I(1)
F-statistic	4.90	10%	2.08	3.00
k	5	5%	2.39	3.38
		3%	2.70	3.73
		1%	3.06	4.15

The ARDL bounds test results for cointegration among the variables are presented in Table 4. The F-statistic computed from the bounds testing procedure is greater than the upper critical bound at conventional significance levels. This implies that there exists a long-run equilibrium relationship between gender inequality and its determinants, and hence cointegration exists among the variables. As a result, estimation of both the long-run coefficients and short-run dynamics within the ARDL framework is supported.

Table 5. Empirical Result

Dependent Variable (GII)	Short-run Dynamics	Long-run Dynamics
REMI	-0.004*** (-6.763)	-0.005** (-2.961)
LPGDP	0.063 (0.457)	0.069 (0.419)
INF	0.005 (1.009)	0.004 (1.259)
EDUE	-0.029*** (-6.350)	-0.069** (-3.938)
FEMAG	0.002*** (3.796)	0.004* (1.699)
Constant	0.291*** (8.262)	1.220* (5.510)
CointEq(-1)*	-0.616*** (-8.222)	
R-squared	0.861	
Prob(F-statistic)	0.000	
D-W statistics	2.045	

Notes: 1. The ARDL model is selected according to the Akaike Information Criterion (AIC), incorporating the HAC option.

2. t-statistics are provided in parentheses.

3. *, **, and *** refers significant at 10%, 5* and 1% respectively.

The empirical results reported in Table 5 highlight both short-run and long-run determinants of gender inequality in Nepal. Remittances exhibit a negative and statistically significant effect in both the short run (-0.004, $p < 0.01$) and the long run (-0.005, $p < 0.05$), indicating that higher remittance inflows consistently contribute to reducing gender inequality, although the magnitude of the effect remains relatively small. Government expenditure on education also shows a strong inequality-reducing role, with negative and highly significant coefficients in the short run (-0.029, $p < 0.01$) and the long run (-0.069, $p < 0.05$), suggesting that public investment in education yields sustained improvements in gender outcomes.

In contrast, female employment in agriculture is positively associated with gender inequality, with statistically significant coefficients in the short run (0.002, $p < 0.01$) and a weaker but still positive effect in the long run (0.004,

$p < 0.10$), reflecting the concentration of women in low-productivity agricultural activities. GDP per capita carries a positive but statistically insignificant coefficient in both the short run and long run, implying that income growth alone does not exert a systematic influence on gender inequality. Inflation also remains statistically insignificant, indicating that price fluctuations do not play a decisive role in shaping gender inequality. The error correction term is negative and significantly large (-0.616 , $p < 0.01$), which strongly verifies the presence of a long-run relationship, implying that about 62 percent of the error correction occurs within one year.

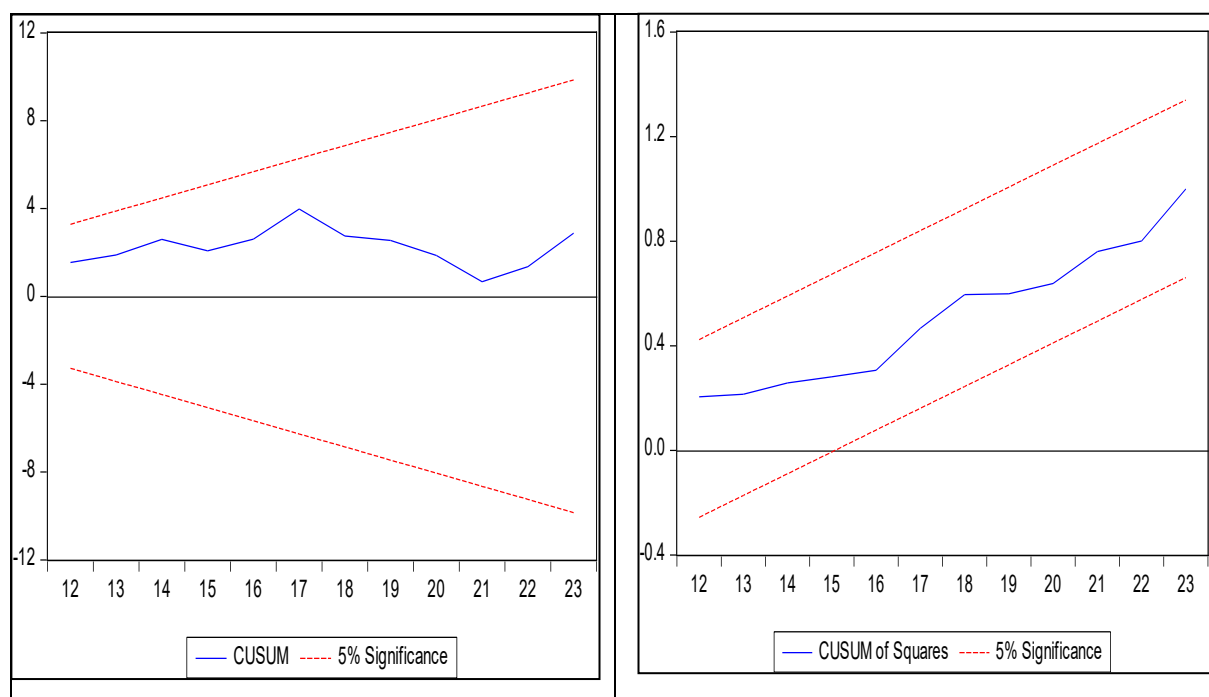
Several recent empirical studies corroborate the observation that remittance inflows and public investment in human capital are linked with improvements in gender outcomes, lending credibility to the results presented in Table 5. For example, Abokyi (2023) reveals that remittances play a significant role in reducing the gender gap in financial inclusion across a broad set of developing countries, pointing toward gender-equalizing effects of remittance flows in macro contexts similar to Nepal's setting. Additionally, panel evidence indicates that higher education levels and associated human capital development are negatively associated with gender inequality, suggesting that variables proxied by government education expenditure play an important role in reducing gender disparity over the long term (Tokal *et al.* 2023). These studies provide external validation that remittance inflows and government support for education can act as institutional drivers that alleviate structural gender inequality, consistent with the negative and significant effects of REMI and EDUE observed in both the short-run and long-run ARDL estimates.

Table 6. Residual Test

	Serial Correlation Test (Breusch-Godfrey Serial Correlation LM Test)	Heteroskedasticity Test (Breusch-Pagan-Godfrey Test)	Histogram-Normality Test (Jarque-Bera)
F-statistic	0.40	0.53	1.22
Prob. value	0.22	0.75	0.55

The results from the residual tests in the ARDL model are shown in Table 6. The Breusch-Godfrey LM test in the ARDL model shows that there is no serial correlation, since the null hypothesis cannot be rejected. The result from the Breusch-Godfrey test also shows that the residuals in the model do not have a constant variance, that is, the residuals do not exhibit homoscedasticity. Finally, the Jarque-Bera test shows that the residuals from the model are normally distributed. The diagnostic tests shown above prove the validity and accuracy of the model.

Figure 3. Stability Test



Source: Author's own figure based on data analysis

Figure 3 shows the result of the CUSUM and CUSUM of Squares Test for the ARDL Model. From the figure, the CUSUM and CUSUM of Squares tests reveal that the values lie below the 5 percent critical regions. This indicates that there are no structural changes/instabilities associated with the parameters of the model. This makes the empirical results reliable and valid, as the parameters are stable over time.

The empirical findings provide several important policy insights for reducing gender inequality in Nepal. First, the negative and statistically significant coefficients on remittance inflows indicate that remittances contribute to reductions in gender inequality in Nepal in both the short run and the long run. Specifically, a one-percentage-point increase in remittance inflows reduces the Gender Inequality Index by approximately 0.005 in the long run. Although this effect is statistically significant, its magnitude is relatively small, indicating that remittances alone are insufficient to fundamentally alter deeply entrenched gender disparities without complementary institutional and labor-market reforms. This interpretation is consistent with recent empirical evidence showing that remittances improve women's welfare primarily by reducing financial pressure and facilitating investments in education and health, rather than by directly transforming patriarchal social norms (Akçay, 2025; Azizi, 2018; Barkat *et al.*, 2026).

Second, the significant inequality-reducing impact of government expenditure on education emphasizes the need for sustained public investment in human capital development. Expanding access to quality education, especially for girls and women in rural areas, can generate long-term improvements in gender equality. In contrast, the positive association between female employment in agriculture and gender inequality indicates that women's concentration in low-productivity agricultural activities may reinforce structural disadvantages. This underscores the need for policies that facilitate women's transition into higher-productivity sectors through skills development, vocational training, and access to non-farm employment opportunities. Finally, the insignificance of GDP per capita and inflation implies that macroeconomic growth and price stability alone are insufficient to reduce gender inequality without targeted social and labor-market interventions. Overall, the results emphasize that gender-inclusive policies focusing on education, labor market transformation, and remittance utilization are essential for achieving sustained reductions in gender inequality in Nepal.

The lack of statistical significance for GDP per capita and inflation indicates that aggregate economic growth and macroeconomic stability, by themselves, do not effectively reduce gender inequality in Nepal. Growth that is not accompanied by structural transformation, particularly the transition of women from low-productivity agriculture into higher-productivity non-farm employment, may fail to generate gender-equalizing effects, even as incomes rise. This finding aligns with SDG 5, which emphasizes that gender equality requires targeted investments in women's education, employment, and empowerment rather than relying on growth alone (UNDP, 2024b). Consequently, Nepal's development strategy must prioritize inclusive structural transformation that explicitly integrates women into emerging sectors to ensure that economic progress translates into sustained reductions in gender inequality.

Conclusion

This study finds that remittance inflows strengthen gender inequality in Nepal in both the short and long run, although the magnitude of these effects remains relatively small. The analysis shows that Remittances function more as an income-smoothing mechanism than by directly transforming entrenched gender inequality. Policies that link remittances with women's skills, formal employment, and labor-market access are essential to amplify their gender-equalizing effects.

The results also emphasize the importance of structural and institutional factors. Public expenditure on education is crucial for reducing gender inequality, while the concentration of women in agricultural employment is associated with higher inequality, reflecting persistent structural constraints. By contrast, GDP per capita and inflation rates are statistically insignificant factors, which may indicate that economic progress and macroeconomic steadiness by themselves cannot ensure gender-equalizing outcomes without any structural change.

The results highlight the importance of policies that complement remittance inflows with investments in education, skills development, and women's access to higher-productivity employment. While the analysis is limited by its reliance on aggregate indicators, it provides valuable macro-level evidence that remittances can support gender equality when embedded within inclusive development and structural reform strategies aligned with SDG 5.

This study has several limitations that should be acknowledged. First, the analysis relies on aggregate national-level time-series data, which may conceal important regional and socioeconomic heterogeneity in the relationship between remittance inflows and gender inequality. Second, although the ARDL approach effectively captures both short-run and long-run dynamics and mitigates some econometric concerns, it does not fully eliminate

potential endogeneity arising from reverse causality or omitted variables. Therefore, the estimated coefficients should be interpreted as long-run associations rather than definitive causal effects. Third, the use of aggregate indicators limits the ability to identify the household- or individual-level mechanisms through which remittances influence women's empowerment and gender inequality. Future research could address these limitations by employing disaggregated household-level data, instrumental-variable techniques, or other identification strategies to better address endogeneity and establish stronger causal relationships between remittance inflows and gender inequality.

Declarations

Credit Authorship Contribution Statement

Birendra Narayan Shah: Conceptualization, Methodology, Data curation, Formal analysis, Software, Writing - original draft, Writing - review and editing.

Bojindra Prasad Tulachan: Conceptualization, Investigation, Formal analysis, Validation, Writing - review and editing.

YoungJib Yoon: Conceptualization, Formal analysis, Validation, Visualization, Writing – review and editing.

Tikaram Aryal: Conceptualization, Investigation, Formal analysis, Validation, Writing – review and editing.

Declaration of Competing Interest: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-assisted Technologies: The authors declare that ChatGPT (GPT-5.5) was used for grammar correction, language refinement, and improving the clarity and readability of the manuscript during its preparation.

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