Janapriya Journal of Interdisciplinary Studies (Jjis)
[A Peer-Reviewed Open Access Journal; Indexed in NepJOL]
ISSN: 2362-1516 (Print), ISSN: 2773-8000 (Online)
Published by Janapriya Research and Consultancy Center (JRCC)
Janapriya Multiple Campus, Pokhara
Journal Homepage: www.janapriya.edu.np

Research Article

The Impact of Gdp Growth, Remittance and Urbanization on Poverty Reduction in Nepal

***Nand Kishor Kumar[1], Omkar Paudel[2]**

[1]Corresponding author, Lecturer, Trichandra Campus, Tribhuvan University, Nepal

[2]Birendra Multiple Campus, Tribhuvan University

*Corresponding Email : nandkishorkumar2025@gmail.com

Article History : *Received Sept. 2024 Revised Nov. 2024 Accepted Dec. 2024*
DOI : *https://doi.org/10.3126/jjis.v13i1.75582*

ABSTRACT

This paper analyzes the dynamics of poverty reduction in Nepal from 1995 to 2023, focusing on the impacts of economic growth, remittances, and urbanization. Employing data from four rounds of the Nepal Living Standards Survey (NLSS), this research employs econometric methods with Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS), to investigate long-run relationships among the variables. The findings of this paper expose a significant negative relationship between GDP growth and the poverty headcount rate, indicating that a 1% increase in GDP per capita leads to a 0.32% decrease in poverty levels. Remittances emerge as a critical factor in poverty alleviation, particularly in rural areas, although reliance on remittances poses risks due to potential fluctuations in global economies. Additionally, this paper highlights the dual challenges posed by urbanization, as increased urban population growth correlates with rising poverty rates, necessitating comprehensive urban policies that address housing and employment needs. This research identifies significant regional disparities in poverty levels, calling for targeted interventions to address the exclusive challenges confronted by both rural and urban populations. Overall, this paper contributes to the literature by providing insights into the complex interplay between economic growth, remittances, and urbanization, and suggests avenues for future research on climate change and digital inequality in Nepal.

Keywords: Poverty reduction, remittances, urbanization, GDP growth, Time series data

Copyright 2024 © the Author(s) and the Publisher

INTRODUCTION

Poverty is the main problem of the world of developing countries. One billion people in the world are living on less than one dollar a day. About 2.7 billion People in the world are living on less than two dollars a day. Eleven million children die every year. 114 million children do not able to achieve basic education and 584 million women are illiterate. Every year, six million children die due to malnutrition. Every day 800 million people stay hungry in which 300 are children. About 2.6 billion People of the world's population 40 percent are depriving from basic sanitation and one billion people are suffering to unsafe drinking water (UNDP, 2002).

Poverty has many faces and different factors cause it such as income inequality, low education, ill health, week intuitions and poor governance. In the developing countries like Nepal population pressure is also considered a cause of poverty. The standard of living is low in the large family due to limited resources. The other reason to large family is given that more children will be helping in the rainy days when people are older. This situation raises child labor and their earning is meager from arduous work and limits them to attended schools. As a result, poverty goes generation to generation and population-poverty trap occurred. Higher population growth is not simply a problem of numbers. It is the problem of development and human welfare as well (UNESCAP, 2002).

Poverty remains a critical challenge in Nepal, despite significant strides made in economic growth and poverty alleviation efforts over the past few decades. According to the World Bank (2021), the poverty headcount rate in Nepal decreased from 42% in 1995 to approximately 18% in 2022; however, substantial disparities persist, particularly between urban and rural areas. Rural communities continue to face high poverty rates, exacerbated by limited access to infrastructure, education, and healthcare services (Nepal Planning Commission, 2022). The dynamics of poverty are further complicated by the migration of rural populations to urban centers in search of better opportunities, resulting in the emergence of new poverty pockets in cities (Uematsu et al., 2016).

This study aims to conduct a longitudinal analysis of poverty reduction in Nepal from 1995 to 2023, focusing on the impacts of GDP growth, remittances, and urbanization. By utilizing data from four rounds of the Nepal Living Standards Survey (NLSS) and employing econometric techniques such as Fully Modified Ordinary Least Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS), this research seeks to provide insights into how these factors influence poverty levels across different regions. The findings aim to inform

policymakers on targeted strategies to promote inclusive economic growth and improve living standards in Nepal.

Several factors contribute to the evolving nature of poverty in Nepal, with remittances and economic growth serving as key drivers. Research has shown that remittances significantly impact poverty reduction, particularly in rural households where income from abroad helps support consumption and investments in health and education (Chaudhary, 2020; Lokshin et al., 2010). Moreover, the positive correlation between economic growth and poverty alleviation is well-documented, with studies indicating that growth can lead to substantial improvements in living standards (Dollar & Kraay, 2002; Balasubramanian et al., 2023). However, as urbanization accelerates, new challenges arise, including increased urban poverty linked to inadequate infrastructure and job creation (Timilsina et al., 2020; Zhu et al., 2022). Understanding these dynamics is crucial for formulating effective policies that address the underlying causes of poverty in both rural and urban contexts.

The literature on poverty in Nepal reveals a complex interplay between economic growth, remittances, urbanization, and their collective impact on poverty dynamics. Economic growth has been identified as a significant factor in poverty alleviation, with the World Bank (2021) noting that robust GDP growth has contributed substantially to reducing poverty levels by increasing household incomes and enhancing access to essential services. This aligns with findings from Balasubramanian et al. (2023), which suggest that economic growth is critical for diminishing multidimensional poverty in low- and middle-income countries. However, research indicates that the benefits of growth are often unevenly distributed, highlighting the need for targeted interventions to ensure that the poorest segments of society also benefit (Dollar & Kraay, 2002; Ravallion & Chen, 1997). Existing studies tend to focus on aggregate poverty trends, yet there remains a gap in understanding how specific economic policies and growth patterns affect rural and urban poverty differently.

Remittances have emerged as a vital component of Nepal's economy, significantly affecting poverty reduction, particularly in rural areas. Research indicates that remittances help many households rise above the poverty line by supplementing incomes and facilitating investments in education and healthcare (Chaudhary, 2020; Lokshin et al., 2010). Abduvaliev and Bustillo (2020) further assert that remittances enhance household resilience against economic shocks, especially in agricultural communities. However, the sustainability of remittance-dependent livelihoods poses challenges, as fluctuations in global economic conditions can adversely impact these inflows (Aziz et al., 2020). Despite the substantial

body of research on remittances, there is a noticeable lack of studies assessing their long-term effects on poverty dynamics, particularly in the context of rising urban poverty.

Urbanization presents both opportunities and challenges for poverty alleviation in Nepal. Rapid migration from rural to urban areas has resulted in increased urban poverty, particularly in informal settlements. The lack of adequate infrastructure, housing shortages, and insufficient employment opportunities have been identified as contributing factors to the rising incidence of urban poverty (Timilsina, et al., 2020). These issues underscore the necessity for comprehensive urban policies that address the unique challenges posed by migration and urban growth. Nonetheless, research focusing specifically on the intersection of urbanization and its effects on rural poverty remains sparse.

Moreover, the literature highlights significant regional disparities in poverty reduction efforts across Nepal. Uematsu et al. (2016) emphasize that while national poverty rates have declined, rural areas—especially those in the Terai and mountainous regions—continue to experience high levels of poverty due to limited access to resources and services. This disparity necessitates the development of region-specific policies that can effectively address the distinct drivers of poverty in various geographic contexts (Thapa et al., 2022). Furthermore, Alkire et al. (2015) argue that multidimensional poverty reduction efforts should be tailored to local contexts, as factors influencing poverty can vary widely between regions.

Additionally, the influence of agricultural development on poverty reduction cannot be overlooked. Gauchan (2008) suggests that improvements in agricultural productivity directly contribute to economic growth and food security, thereby aiding in poverty alleviation. This is particularly relevant for Nepal, where a significant portion of the population depends on agriculture for their livelihoods. Integrating agricultural development with economic policies aimed at poverty reduction may prove essential for sustained progress in poverty alleviation.

In summary, this literature review highlights the multifaceted nature of poverty in Nepal, illustrating the critical roles of GDP growth, remittances, urbanization, and agricultural development in shaping poverty dynamics. It emphasizes the importance of addressing regional disparities and developing targeted policies that cater to the unique challenges faced by both rural and urban populations. By identifying existing gaps in the literature, this review lays the groundwork for the current study, which aims to provide a comprehensive analysis of these themes through a longitudinal approach using data from the Nepal Living Standards Survey (CBS, 2022).

Rural poverty and inequality in Nepal are increasing due to population growth, with

90% of people in villages relying on agriculture. However, this sector faces challenges like low productivity due to lack of resources and technology. Unemployment, underemployment, low infrastructure development, and inadequate social services negatively impact rural poor income consumption and saving, while families with diverse income sources have higher incomes and savings (CBS,2011).

Inequalities in income distribution can boost capital formation, investment, and employment, reducing poverty. However, in Nepal, this is not the case due to an unfavorable investment environment, resulting in slow growth. Poverty is widespread, causing thousands of children to die before five dues to malnutrition. Rural areas suffer from insufficient income, poor food, and unhealthy living conditions. Many people work to supplement family income, exposing their children to local quakes and exposing them to unhealthy environments (CBS,2011).

DATA AND METHOD

This study employs a longitudinal design to examine poverty trends in Nepal from 1995-96 to 2022-23, drawing on data from four iterations of the Nepal Living Standards Survey (NLSS), a nationally representative survey series. The NLSS was conducted by the National Statistics Office (NSO) of Nepal, with technical support from the World Bank, in four rounds: NLSS-I (1995-96), NLSS-II (2003-04), NLSS-III (2010-11), and NLSS-IV (2022-23). Each survey round utilized a stratified multi-stage sampling design to ensure a representative sample of the Nepalese population, allowing for robust analysis of poverty trends across urban and rural settings.

This study utilizes secondary data from four rounds of the Nepal Living Standards Survey (NLSS) conducted between 1995 and 2023. The NLSS, administered by the National Statistics Office (NSO) of Nepal with technical support from the World Bank, provides comprehensive demographic, economic, and social indicators essential for understanding poverty dynamics across various geographic regions. The survey rounds include NLSS-I (1995-96), NLSS-II (2003-04), NLSS-III (2010-11), and NLSS-IV (2022-23), employing a stratified multi-stage sampling design to ensure a representative sample of the Nepalese population.

The NLSS is a highly regarded source of data, and its reliability has been validated through rigorous methodologies, including the use of a well-established sampling design and consistent data collection processes across all rounds. The NSO, in collaboration with the World Bank, has ensured that each survey adheres to international standards for data quality,

with regular checks to maintain consistency across survey waves. Additionally, the data's validity has been cross-checked with other national and international sources to ensure its robustness in reflecting the demographic and economic realities of Nepal.

Since the data is secondary, all ethical considerations related to data collection were handled by the NSO and World Bank at the time of the surveys. The NLSS surveys adhere to ethical guidelines, including obtaining informed consent from participants, maintaining confidentiality, and ensuring the anonymity of respondents. For this study, all data used is publicly available and was utilized in compliance with ethical research practices, with appropriate permissions obtained from the data providers.

The statistical analyses conducted on the NLSS data are based on certain assumptions, including normality of data distributions, independence of observations, and homogeneity of variances. These assumptions were carefully considered when applying statistical tests. In cases where assumptions were violated (e.g., non-normality or missing data), appropriate corrective measures, such as data transformations or the use of robust statistical techniques, were employed to ensure the validity of the results. Additionally, sensitivity analyses were conducted to examine the impact of these adjustments on the overall findings.

Table 1

Variable, their description and measurement

Variables	Definition	Measurement
PHR	Poverty Headcount Rate	%
GDP	Gross Domestic Product Per Capita.	PPP (current international $)
REM	Personal remittances, received	% of GDP
UP	Urban population growth	annual %

The dependent variable in this study, the Poverty Headcount Rate (PHR), measured as the percentage of the population living below the national poverty line, was interpolated using EViews 12 to create a continuous time series for analysis. This interpolation allows for the estimation of PHR values for the years between the survey rounds, providing a more granular view of poverty trends over time. The independent variables include Gross Domestic Product per capita (LNGDP), Remittances as a percentage of GDP (LNREM), and Urban Population Growth (LNUP), which are also transformed using natural logarithms to stabilize variance and linearize relationships among variables. This comprehensive dataset enables a robust econometric analysis of the factors influencing poverty reduction in Nepal.

To investigate the determinants of poverty in Nepal, this study employs several

econometric techniques, including Fully Modified Ordinary Least Squares (FMOLS), Dynamic Ordinary Least Squares (DOLS), and Canonical Cointegrating Regression (CCR). These methods are particularly suited for analyzing long-run relationships in time series data, as they account for issues such as endogeneity and serial correlation, thereby providing unbiased estimates. Additionally, unit root tests, including the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, are conducted to assess the stationarity of the time series data, ensuring that the series are integrated of the same order before proceeding to cointegration analysis (Poudel, 2022).

The Hansen Parameter Instability test was used to examine the stability of the long-run relationships between headcount poverty (PHR), GDP, REMand UP. The Lc statistic helps detect whether the cointegrating vectors remain stable over time. The results suggest that the series are cointegrated, with stability confirmed at certain significance levels.

The Wald test was conducted to assess the joint significance of the coefficients in the model for PHR, GDP, REM and UP. This test determines whether the independent variables collectively have a significant effect on PHR. The high F-statistics and corresponding p-values indicate that GDP, REM and UP jointly influence PHR in the long run (Acharya et al.,2024).

To further understand the relationships among the variables, pairwise Granger causality tests are employed. These tests assess whether one variable can predict another, providing insights into the directionality of the relationships among GDP, remittances, urban population growth, and poverty headcount rates. This methodological approach enables the exploration of the complex dynamics of poverty in Nepal, emphasizing the importance of both economic and social factors in shaping poverty outcomes (Poudel et al., 2024; Poudel, 2023).

RESULTS AND DISCUSSION

This section presents the findings from the econometric analysis conducted to investigate the relationship between economic growth, remittances, urbanization, and poverty reduction in Nepal. The results are organized into several subsections, detailing the descriptive statistics, econometric model outputs, and key relationships among the variables.

Analysis of Poverty Trends in Nepal (1995-96 to 2022-23)

The analysis of Table 1, which displays the incidence of poverty in Nepal from the Nepal Living Standards Surveys (NLSS) I-IV, provides insight into the progression of poverty across national, urban, and rural contexts. Each survey (1995-96, 2003-04, 2010-11, and 2022-23)

evaluates poverty through three key indicators: the headcount ratio (P_0), poverty gap (P_1), and squared poverty gap (P_2). These metrics reveal a decline in poverty over the nearly three-decade period, although urban and rural areas exhibit distinct trends and disparities.

Table 2

Incident of Poverty from 1995-96 to 2022-23

Region and Poverty Incidence	NLSS-I 1995-96	NLSS-II 2003-04	NLSS -III 2010-11	NLSS-IV 2022-23
Headcount rate (P_n)				
Nepal	41.76	30.85	25.16	20.27
Urban	21.55	9.55	15.46	18.34
Rural	43.27	34.62	27.43	24.34

Nationally, the headcount ratio declined from 41.76% in 1995-96 to 20.27% in 2022-23, underscoring effective poverty reduction. However, urban and rural differences are stark: urban poverty decreased substantially from 21.55% to 9.55% by 2003-04, but rose to 18.34% in 2022-23, reflecting urban migration pressures. Meanwhile, rural poverty consistently decreased from 43.27% in 1995-96 to 24.34% in 2022-23, indicating progress driven by rural development and remittance inflows, although these gains remain vulnerable to economic shocks affecting the agricultural sector.

Descriptive Statistics

Applying a log transformation in econometric analysis helps stabilize variance, linearize relationships among variables, and simplify interpretation. This approach also reduces data skewness and allows coefficients to be interpreted as elasticities or percentage changes, providing greater insight in economic studies.

Table 3

Descriptive Statistics

	LNPHR	LNGDP	LNREM	LNUP
Mean	3.315777	7.649504	2.348670	1.265195
Median	3.272460	7.598124	3.023826	1.165809
Maximum	3.731939	8.509138	3.318760	1.877867
Minimum	3.009142	6.961632	-0.023624	0.793080
Std. Dev.	0.220975	0.477025	1.192775	0.357351
Skewness	0.413650	0.268491	-1.083441	0.527570
Kurtosis	1.937282	1.809583	2.430195	1.916414
Observations	28	28	28	28

The descriptive statistics in Table 3 provide insights into the natural logarithms of the Poverty Headcount Rate (LNPHR), Gross Domestic Product (LNGDP), Remittance (LNREM), and Urban Population (LNUP). The mean values indicate central tendencies, with LNGDP and LNPHR averaging 7.65 and 3.32, respectively, suggesting a relatively high GDP compared to the poverty level. The standard deviations reveal variability, particularly for LNREM (1.19), suggesting fluctuations in remittances, likely tied to economic migration and external employment opportunities. The skewness and kurtosis metrics show asymmetry and peaked with LNREM notably left-skewed (-1.08), indicating that most data points fall above the mean, reflecting a generally positive remittance trend despite outliers. In contrast, LNPHR and LNGDP are slightly right-skewed, implying a concentration of values below the mean, reflecting a moderate variation in GDP and poverty levels. These statistics are economically relevant as they hint at GDP growth's role in poverty reduction, while remittance levels seem crucial in supplementing household incomes, potentially affecting poverty dynamics. Additionally, the lower variation in LNUP points to gradual urban population growth, which, alongside GDP and remittances, could influence poverty alleviation efforts through increased economic opportunities and improved living standards in urban centers.

Covariance Analysis: Ordinary

Analyzing trend lines in time series data reveals patterns and shifts in variable behaviors over time, facilitating the identification of long-term trends and seasonality. This approach aids in interpreting the direction and consistency of changes, especially in economic contexts. Figure 1 below presents the time series plots of the key variables, highlighting their trends.

Table 4

Covariance Analysis for PHR, GDP, REM and UP

Correlation (Probability)	LNPHR	LNGDP	LNREM	LNUP
LNPHR	1.0000			
LNGDP	-0.9642	1.0000		
	0.0000			
LNREM	-0.9152	0.7918	1.0000	
	0.0000	0.0000		
LNUP	0.7115	-0.5262	-0.8951	1.0000
	0.0000	0.0040	0.0000	

The covariance analysis in Table 4 highlights significant relationships among the natural logarithms of Poverty Headcount Rate (LNPHR), Gross Domestic Product (LNGDP),

Remittances (LNREM), and Urban Population (LNUP), with implications for economic policy and poverty reduction strategies. The negative and strong correlation between LNPHR and LNGDP (-0.9642, p = 0.0000) suggests that higher GDP is closely associated with lower poverty rates, supporting the role of economic growth in poverty alleviation. Similarly, LNREM shows a negative relationship with LNPHR (-0.9152, p = 0.0000), indicating that remittances significantly contribute to reducing poverty, likely by boosting household incomes and supporting consumption. LNUP positively correlates with LNPHR (0.7115, p = 0.0000), suggesting that urbanization might be linked to rising poverty rates, possibly due to migration-driven urban population growth outpacing job creation or income opportunities. The positive correlation between LNGDP and LNREM (0.7918) underscores the potential synergistic effect of remittance flows and GDP growth in bolstering economic stability, while the negative correlation between LNUP and both LNGDP (-0.5262) and LNREM (-0.8951) indicates that as urbanization increases, both GDP growth and remittance impacts may be diluted, presenting a challenge for inclusive urban development. These findings underscore the complex interplay between GDP growth, remittance inflows, and urbanization in shaping poverty outcomes, guiding policymakers to balance urban development with economic growth and remittance-boosting initiatives.

Figure 1

Time Series Plots of PHR, GDP, REM and UP

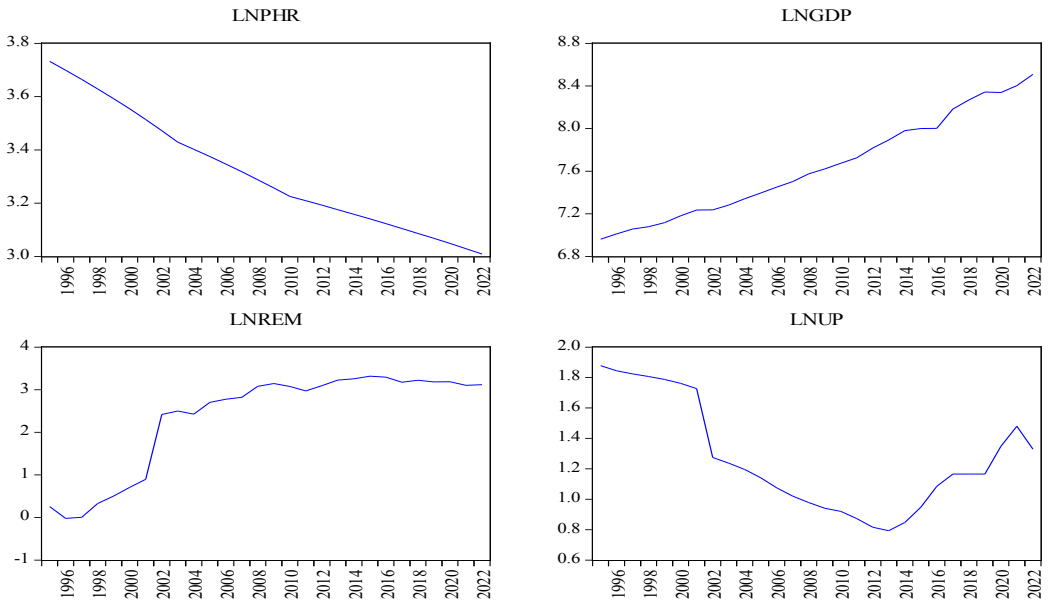

Figure 1 presents the time series plots of the Poverty Headcount Rate (PHR), Gross Domestic Product (GDP), Remittances (REM), and Urban Population (UP), providing a visual depiction of their trends over time. The PHR plot typically shows a declining trend, reflecting gradual poverty reduction, possibly due to economic growth and remittance inflows. GDP exhibits an upward trajectory, indicating consistent economic growth that likely supports improvements in income and living standards. REM shows fluctuations, reflecting external factors influencing remittance inflows, such as global economic conditions and migration policies, which play a crucial role in household income and poverty reduction. Meanwhile, UP displays fluctuations, indicating increasing urbanization, which could signal shifts in labor distribution and economic activities from rural to urban areas. This visualization helps reveal the dynamic relationships between economic growth, remittances, and urbanization in relation to poverty, suggesting a need for policies that harness GDP growth and remittance potential while addressing challenges of rapid urban population growth.

Table 5

Results of Unit Root Test

	PP			ADF		
Level	Const.	Const & Trend	None	Const.	Const & Trend	None
LNPHR	-5.7641***	-0.8481	-10.6682***	-2.7131*	-1.8303	-1.3643
LNGDP	6.3126	-1.3398	11.5183	2.8921	-1.0848	4.7461
LNREM	-1.7631	-0.7944	0.6600	-3.9041***	-0.8462	0.7662
LNUP	-1.7621	-0.5607	-1.2955	-1.8246	-0.5084	-1.3894
First Difference						
LNPHR	-1.2588	-2.5906	-0.9786	-1.2799	-2.5906	-0.9418
LNGDP	-4.8078***	-12.0800***	-1.4437	-0.6356	-4.0940**	2.1428
LNREM	-4.6107***	-6.0417***	-4.1390***	-4.6113***	-4.2344**	-1.3271
LNUP	-3.6588**	-4.0665**	-3.6333***	-3.6588**	-3.1481	-3.6333***

Table 5 displays the results of unit root tests (Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF)) for the variables LNPHR, LNGDP, LNREM, and LNUP, both at their levels and first differences, assessing their stationarity properties essential for time series modeling. At level, LNPHR is stationary under PP (constant, none) and ADF (constant) tests, indicated by significant test statistics at the 1% level , suggesting it is integrated of order zero I(0) in these cases. LNGDP, LNREM, and LNUP show non-stationarity at levels, confirmed by insignificant statistics across most specifications. When differenced once, LNGDP, LNREM, and LNUP exhibit stationarity, as shown by significant PP and ADF statistics, particularly under PP for LNGDP (-12.0800) and LNREM (-6.0417***), and both tests for LNUP. These

results indicate that while LNPHR may not need differencing in specific tests, LNGDP, LNREM, and LNUP generally achieve stationarity upon first differencing, implying they are I(1) and suitable for further econometric analyses such as cointegration testing like FMOLS, DOLS and CCR.

Table 6

Results of FMOLS, DOLS and CCR (Long-run Coefficients)

Dependent Variable: PHR

Method	FMOLS		DOLS		CCR	
Variable	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
LNGDP	-0.320348	0.0000	-0.330619	0.0000	-0.319921	0.0000
LNREM	-0.049177	0.0015	-0.036883	0.0148	-0.049296	0.0015
LNUP	0.065677	0.0577	0.094249	0.0088	0.066100	0.0532
C	5.798148	0.0000	5.790199	0.0000	5.795054	0.0000

Table 6 presents the long-run coefficients from the Fully Modified Ordinary Least Squares (FMOLS), Dynamic Ordinary Least Squares (DOLS), and Canonical Cointegrating Regression (CCR) models with the Poverty Headcount Rate (PHR) as the dependent variable. Across all models, LNGDP has a statistically significant and negative coefficient (FMOLS: -0.320348, DOLS: -0.330619, CCR: -0.319921) with p-values of 0.0000, indicating that as GDP increases, the poverty rate decreases. This suggests a strong inverse relationship between economic growth and poverty, supporting the idea that higher GDP helps alleviate poverty. Similarly, LNREM also shows a negative effect on PHR, with coefficients slightly smaller in magnitude (FMOLS: -0.049177, DOLS: -0.036883, CCR: -0.049296) but still significant (p-values ranging from 0.0015 to 0.0148), implying that remittances contribute to poverty reduction, likely by raising household incomes. The positive coefficients for LNUP (FMOLS: 0.065677, DOLS: 0.094249, CCR: 0.066100) suggest that urban population growth may slightly increase poverty levels, possibly due to pressures on urban infrastructure and labor markets, though the significance varies slightly across methods (p-values between 0.0577 and 0.0088). The consistent and highly significant constant term across models indicates stable baseline effects. These results underscore the importance of GDP growth and remittances in reducing poverty, while highlighting the need for policies that address challenges associated with urbanization.

Table 7

Cointegration Test - Hansen Parameter Instability

Series: PHR, GDP, REM and. UP Null hypothesis: Series are cointegrated

Method	FMOLS	DOLS	CCR
Lc statistic	0.553577	0.079030	0.237191
Prob.*	0.1794	> 0.2	> 0.2
Stochastic Trends (m)	3	3	3
Deterministic Trends(k)	0	0	0
Excluded Trends (p2)	0	0	0

Table 7 presents the results of the Hansen Parameter Instability Cointegration Test for the series PHR, GDP, REM, and UP, using FMOLS, DOLS, and CCR methods. The test examines the null hypothesis that the series are cointegrated. The Lc statistics for each method (FMOLS: 0.553577, DOLS: 0.079030, CCR: 0.237191) have probabilities exceeding the standard threshold ($p > 0.2$ for DOLS and CCR, 0.1794 for FMOLS), indicating an inability to reject the null hypothesis. Thus, these results suggest that PHR, GDP, REM, and UP share a long-run equilibrium relationship, supporting cointegration among the variables. Additionally, the test identifies three stochastic trends ($m = 3$) with no deterministic or excluded trends ($k = 0$, $p2 = 0$), reinforcing the stability of the long-term relationships without deterministic shifts. This stability implies that despite short-term fluctuations, GDP, remittances, and urbanization maintain a consistent, long-run association with poverty rates, affirming their importance in poverty modeling and policy analysis.

Table 8

Wald Test

Method	FMOLS		DOLS		CCR	
Test Statistic	F-statistic	Chi-square	F-statistic	Chi-square	F-statistic	Chi-square
Value	952.5368	2857.610	838.4210	2515.263	984.8700	2954.610
Df	(3, 23)	3	(3, 12)	3	(3, 23)	3
Probability	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Table 8 displays the results of the Wald Test for the long-run coefficients estimated by FMOLS, DOLS, and CCR methods, assessing the joint significance of GDP, REM, and UP in explaining variations in PHR. The test statistics are substantial across all methods, with F-statistics of 952.5368 (FMOLS), 838.4210 (DOLS), and 984.8700 (CCR), and corresponding Chi-square values of 2857.610, 2515.263, and 2954.610, respectively. All probability values are 0.0000, indicating statistical significance at the highest level across methods. These results

confirm that the combined effects of GDP, remittances, and urbanization are highly significant in explaining the variations in poverty headcount rate (PHR) in the long run. This supports the robustness of the model specifications and emphasizes the critical role of economic growth, remittance flows, and urbanization trends in poverty dynamics, offering a reliable basis for policy interventions targeting poverty reduction.

Table 9

Pairwise Granger Causality Tests

Null Hypothesis:	Obs.	F-Statistic	Prob.
LNGDP →LNPHR	26	0.62808	0.5433
LNPHR → LNGDP		0.99097	0.3879
LNREM →LNPHR	26	4.87448	0.0182
LNPHR→LNREM		0.25920	0.7741
LNUP →LNPHR	26	4.00206	0.0337
LNPHR →LNUP		1.01538	0.3794
LNREM →LNGDP	26	0.50532	0.6105
LNGDP →LNREM		0.33370	0.7200
LNUP →LNGDP	26	0.36126	0.7010
LNGDP →LNUP		1.05342	0.3665
LNUP →LNREM	26	0.00704	0.9930
LNREM →LNUP		0.50488	0.6107

Table 9 presents the results of the Pairwise Granger Causality Tests examining the relationships among LNGDP, LNPHR, LNREM, and LNUP. The findings indicate that LNGDP does not significantly influence the Poverty Headcount Rate (PHR), as evidenced by the F-statistics of 0.62808 ($p = 0.5433$) and 0.99097 ($p = 0.3879$) for the respective directions of causality. In contrast, remittances (LNREM) exhibit a significant causal effect on PHR, with an F-statistic of 4.87448 ($p = 0.0182$), suggesting that higher remittance inflows can contribute to reducing poverty levels. Conversely, the reverse relationship is not significant, indicating that poverty rates do not affect remittance levels. Similarly, urban population growth (LNUP) significantly impacts PHR (F-statistic = 4.00206, $p = 0.0337$), suggesting that increasing urbanization may drive changes in poverty rates. However, there are no significant causal relationships between GDP and remittances, or between urbanization and GDP, implying that these variables may operate independently in this context. Moreover, the relationships between urban population growth and remittances show no significant causality, indicating that changes in urban demographics do not significantly influence remittance flows. Overall, the results emphasize the critical role of remittances and urbanization in shaping poverty

dynamics, while highlighting the independence of GDP from these relationships.

Table 10

Normality Test

Method	FMOLS	DOLS	CCR
Jarque-bera	0.842477	3.997420	0.848747
Probability	0.656233	0.135510	0.654179

Table 10 summarizes the results of the Normality Test conducted using the Jarque-Bera statistic for the coefficients estimated by the FMOLS, DOLS, and CCR methods. The Jarque-Bera test evaluates whether the distribution of the residuals from the regression analysis deviates significantly from a normal distribution (Khatri et al., 2024). The test statistics reveal values of 0.842477 (FMOLS), 3.997420 (DOLS), and 0.848747 (CCR), with corresponding probabilities of 0.656233, 0.135510, and 0.654179, respectively. A high p-value (greater than 0.05) in each case indicates that we fail to reject the null hypothesis of normality. This suggests that the residuals from the estimated models are normally distributed, which is a crucial assumption for the validity of the inferential statistics derived from the models. The results imply that the estimates obtained from the FMOLS, DOLS, and CCR methods can be considered reliable, supporting the robustness of the findings and the appropriateness of using these techniques for analyzing the long-run relationships among the variables.

DISCUSSION

The findings of this study underscore the complex dynamics of poverty reduction in Nepal, emphasizing the critical roles of economic growth, remittances, and urbanization. The analysis confirms a significant negative relationship between GDP growth and the poverty headcount rate, which aligns with previous research highlighting the importance of inclusive economic growth for alleviating poverty (Dollar & Kraay, 2002; Balasubramanian et al., 2023). Specifically, the results indicate that a 1% increase in GDP per capita can lead to an approximate 0.32% decrease in poverty levels. This suggests that targeted economic policies can effectively enhance living standards across the population and drive poverty alleviation.

Remittances emerged as a vital factor in poverty alleviation, supporting findings from Lokshin et al. (2010) and Chaudhary (2020). The significant negative coefficient associated with remittances underscores their role as a lifeline for many households, particularly in rural areas where economic opportunities are limited. However, reliance on remittances raises concerns about sustainability, as fluctuations in global economies can impact these inflows,

posing risks to household income stability (Aziz et al., 2020). Therefore, policymakers must focus on diversifying income sources in rural areas to mitigate the vulnerabilities associated with remittance dependence.

Urbanization presents both opportunities and challenges for poverty dynamics. While urban areas have benefited from economic growth, the positive relationship between urban population growth and poverty indicates that rapid migration can lead to increased poverty rates if not accompanied by adequate infrastructure and job creation. This finding is consistent with the challenges highlighted by Timilsina et al. (2020), which emphasize the need for comprehensive urban policies that address the issues arising from migration. Investments in housing, sanitation, and employment opportunities are essential to ensure that urban growth does not exacerbate poverty levels.

Moreover, the study identifies significant regional disparities in poverty levels, particularly between urban and rural areas. Uematsu et al. (2016) highlight that while national poverty rates have declined, rural regions continue to experience higher poverty levels due to limited access to resources and services. This research underscores the importance of developing region-specific policies that address the unique drivers of poverty across diverse geographic contexts, especially in rural areas that continue to lag in poverty reduction efforts.

In summary, this study contributes to the literature by providing a comprehensive analysis of the interconnections among economic growth, remittances, and urbanization in shaping poverty dynamics in Nepal. It emphasizes the need for targeted and integrated policy approaches that effectively address both rural and urban poverty challenges while promoting inclusive economic growth. Future research should explore the long-term impacts of remittances on poverty dynamics and investigate the effects of climate change and digital inequality on poverty, as these emerging issues are likely to influence Nepal's socio-economic landscape in the coming years.

CONCLUSIONS

This paper provides a comprehensive analysis of poverty reduction in Nepal from 1995 to 2023, highlighting the critical roles of economic growth, remittances, and urbanization in shaping poverty dynamics. The findings reveal a significant negative relationship between GDP growth and the poverty headcount rate, indicating that a 1% increase in GDP per capita results in an estimated 0.32% decrease in poverty levels. This underscores the importance of inclusive economic policies that foster sustainable growth. Additionally, remittances have

proven to be vital in reducing poverty, particularly in rural areas, where they serve as a key source of household income. However, the study also points to the risks associated with over-reliance on remittances, emphasizing the need to diversify income sources to enhance resilience against global economic fluctuations.

Furthermore, urbanization presents both opportunities and challenges, as rising urban population growth correlates with increased poverty rates. This finding underscores the necessity for comprehensive urban policies that address housing, employment, and essential services, ensuring urban growth does not exacerbate poverty levels. The research identifies significant regional disparities in poverty, emphasizing the need for targeted policies that cater to the unique challenges faced by both rural and urban populations. In summary, this study contributes to the literature by offering a longitudinal perspective on poverty dynamics in Nepal and suggesting that future research should explore the long-term impacts of remittances and the emerging issues of climate change and digital inequality, which are likely to influence Nepal's socio-economic landscape in the coming years.

REFERENCES

Abduvaliev, M., & Bustillo, R. (2020). Impact of remittances on economic growth and poverty reduction amongst CIS countries. *Post-Communist Economies*, *32*(4), 525-546. https://doi.org/10.1080/14631377.2019.1678094

Acharya, B., Poudel, O., Upadhyaya, Y. M., & Acharya, P. (2024). A comprehensive analysis of remittances and basic level government school enrollment in Nepal. *International Research Journal of MMC*, *5*(3), 86-103. https://doi.org/10.3126/irjmmc.v5i3.68503

Alkire, S., & Seth, S. (2015). Multidimensional poverty reduction in India between 1999 and 2006: Where and how?. *World Development*, *72*, 93-108. https://doi.org/10.1016/j.worlddev.2015.02.009

Alkire, S., Jindra, C., Robles Aguilar, G., & Vaz, A. (2017, April). Multidimensional poverty reduction among countries in Sub-Saharan Africa. In *Forum for Social Economics* (Vol. 46, No. 2, pp. 178-191). Routledge. https://doi.org/10.1080/07360932.2017.1310123

Alkire, S., Oldiges, C., & Kanagaratnam, U. (2021). Examining multidimensional poverty reduction in India 2005/6–2015/16: Insights and oversights of the headcount ratio. *World Development*, *142*, 105454. https://doi.org/10.1016/j.worlddev.2021.105454

Aziz, Y., Mansor, F., Waqar, S., & Haji Abdullah, L. (2020). The nexus between zakat and poverty reduction, is the effective utilization of zakat necessary for achieving SDGs: A

multidimensional poverty index approach. *Asian Social Work and Policy Review*, *14*(3), 235-247. https://doi.org/10.1111/aswp.12212

Balasubramanian, P., Burchi, F., & Malerba, D. (2023). Does economic growth reduce multidimensional poverty? Evidence from low-and middle-income countries. *World Development*, *161*, 106119. https://doi.org/10.1016/j.worlddev.2022.106119

Chaudhary, D. (2020). Influence of remittances on socio-economic development in rural Nepal. *Remittances Review*, *5*(1), 83-96. https://www.ceeol.com/search/article-detail?id=870886

CBS (Central Bureau of Statistics) (2011). *National Population and Housing Census 2011(National Report)*. CBS, NPC, GON.

CBS (1997). *Nepal living standards survey 1995/96: Report*. Government of Nepal. https://microdata.worldbank.org/index.php/catalog/2301

CBS (2004). *Nepal living standards survey 2003/04: Report*. Government of Nepal. https://microdata.nsonepal.gov.np/index.php/catalog/9

CBS (2011). *Nepal living standards survey 2010/11: Report*. Government of Nepal. https://microdata.nsonepal.gov.np/index.php/catalog/37/pdf-documentation

CBS (2011). *Statistical Year Book Nepal*. CBS, NPC, GON.

CBS (2011*). Nepal Living Standards Survey Household 2010-2011*. Volume one. CBS, NPC, GON.

CBS (2011). *Nepal Living standards Survey Household 2010-2011*. Volume Two. CBS, NPC, GON.

CBS (2019). *Statistical Bulletin.* Volume 121 and 122. Kathmandu: CBS, NPC, GON.

Dollar, D., & Kraay, A. (2002). Growth is good for the poor. *Journal of Economic Growth*, 7(3), 195-225. https://doi.org/10.1023/A:1020139631000

Gauchan, D. (2008). Agricultural development in Nepal: Contribution to economic growth, food security and poverty reduction. *Socio Economic Development Panorama*, *1*(3), 49-64.

Khatri, B. B., Poudel, O., Kafle, S. C., Acharya, P., & Simkhada, D. (2024). Trend analysis of tourist-arrivals in Nepal using Auto-Regressive Integrated Moving Average (ARIMA) model. *Journal of Tourism & Adventure*, *7*(1), 120-143. https://doi.org/10.3126/jota.v7i1.69542

Lokshin, M., Bontch Osmolovski, M., & Glinskaya, E. (2010). Work related migration and poverty reduction in Nepal. *Review of Development Economics*, *14*(2), 323-332. https://

doi.org/10.1111/j.1467-9361.2010.00555.x

National Statistics Office. (2023). *Nepal living standards survey 2022/23: Report*. Government of Nepal. https://nepalindata.com/media/resources/items/0/b1707800524_89_pdf.pdf

Nepal Planning Commission. (2022). *Poverty Alleviation Action Plan: A Framework for Action*. Government of Nepal.

Paudel, R. C., & Acharya, C. P. (2022). Cooperatives and economic growth in a developing country: The case of Nepal. *Annals of Public and Cooperative Economics*, *93*(3), 797-815. https://doi.org/10.1111/apce.12323

Poudel, O. (2022). Impacts of foreign direct investment on economic growth of Nepal: A Johansen Co-integration analysis. *Journal of Balkumari College, 11*(1), 50. https://doi.org/10.3126/jbkc.v11i1.53023

Poudel, O. (2023). Relationship between defense expenditure and economic growth in Nepal. *Unity Journal, 4*(1), 208-226. http://dx.doi.org/10.3126/unityj.v4i01.52242

Poudel, O., Kharel, K. R., Acharya, P., Simkhada, D., & Kafle, S. C. (2024). ARIMA Modeling and forecasting of national consumer price index in Nepal. *Interdisciplinary Journal of Management and Social Sciences, 5*(1), 105-118. http://dx.doi.org/10.3126/ijmss.v5i1.62666

Ravallion, M., & Chen, S. (1997). What can new survey data tell us about recent changes in distribution and poverty? *The World Bank Economic Review*, *11*(2), 357-382. https://doi.org/10.1093/wber/11.2.357

Thapa, R., Dhakal, S. C., & Gurung, B. (2022). Relationship between unemployment rate and economic growth in Nepal: An econometric estimation. *Turkish Journal of Agriculture-Food Science and Technology*, *10*(8), 1586-1593. https://doi.org/10.24925/turjaf.v10i8.1586-1593.5358

Timilsina, G., Hochman, G., & Song, Z. (2020). Infrastructure, economic growth, and poverty. *World Bank Group*. http://www.worldbank.org/prwp

Uematsu, H., Shidiq, A. R., & Tiwari, S. (2016). Trends and drivers of poverty reduction in Nepal: A historical perspective. *World Bank Policy Research Working Paper*, (7830). https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2849131

UNESCAP (United Nations Economic and Social Commission For Asia and Pacifi) (2002). *Reduced inequality within and among countries*. UNESCAP.

UNDP (United Nations Development programme) (2002). *Human millenium development report.* UNDP United Nations Development Programme.

World Bank. (2021). *Nepal development update: Resilience through reforms*. World Bank Group.

Zhu, Y., Bashir, S., & Marie, M. (2022). Assessing the relationship between poverty and economic growth: does sustainable development goal can be achieved?. *Environmental Science and Pollution Research*, *29*(19), 27613-27623. https://doi.org/10.1007/s11356-021-18240-5