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Sectoral Foreign Aid and Income Inequality in Nepal

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Abstract

Objective: The objective of this paper is to analyze the impact of foreign aid on income inequality in Nepal with disaggregation of foreign aid into four major sectors: social sector, economic sector, production sector, and multi-sector. **Methodology:** This study uses time-series annual data over the period 2002-2023. The autoregressive distributed lag; bound test and error correction model are applied to find short-run and long-run impact. **Result:** The bounds test for cointegration, confirms that there is no long-run relationship between the dependent variable and the set of covariates in all regressions. The short-term dynamics results indicate that aggregated foreign aid has a negative and statistically significant impact on income inequality in Nepal. When foreign aid is disaggregated by sector, its impact varies. Aid directed toward the social sector and multi-sector initiatives appears to reduce income inequality, whereas aid to the economic and production sectors shows a weaker and inconsistent effect on inequality.

Conclusion: Social and multi-sector aid effectively reduces inequality by directing funds to health, education, social services, and environmental protection projects benefiting low-income populations. Conversely, economic and production sector aid often supports urban projects, reaching fewer marginalized communities. Policymakers should prioritize social programs and adapt economic aid to promote inclusive growth, such as rural infrastructure and small enterprise support, to improve equity. Also, Nepal should adopt policies that prioritize sustainable and inclusive development to strengthen the long-term relationship between aid and inequality.

Keywords : Sectoral Aid, Income Inequality, ARDL, Bound Test, Nepal

JEL Classification Code: C23, F35, O47

1. Introduction

The impact of foreign aid on economic development remains one of the most controversial issues in economic analysis. Foreign aid, also known as official development assistance (ODA) has been considered an important tool in reducing poverty and inequality in less and developing countries. The idea of foreign aid started with a good intention to improve living conditions in these nations. Every year billions of dollars have been distributed for education, health, infrastructure humanitarian, and so on for over 60 years. Despite the good intentions, the gap between the richest and poorest countries continues to widen. Many researchers found that aid has failed to achieve desirable results (Weerasingha & Mustafa 2019; Rao et

al., 2020; Shah & Hwang 2022; Shah et al., 2022). The international aid community strategically serves aid in such a way that wealthier countries feel good about their contributions rather than genuinely benefiting the recipients. Every dollar of aid given to poor countries often receives back between seven to ten dollars through mechanisms like debt repayment and trade (Chisti, 2016). However, it is also important to ensure that aid amount should be used efficiently and effectively to find its real impact.

The earlier study on the role of foreign aid in economic development using the “two-gap” model, suggests that foreign aid addresses two key gaps. The financing gap is where a country lacks resources for investment and the trade balance gap, reflects a shortage of foreign currency to pay for necessary imports. Also, recommends that foreign aid could help break the

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“vicious circle of poverty” by promoting productivity and growth, ultimately improving living standards in less developed countries (Chenery & Strout, 1966). Further, underdeveloped countries also experience a “fiscal deficit,” where the government lacks the necessary funds to support public investments in infrastructure, education, and other essential social sectors needed for development. As a result, foreign aid is viewed as a way to bridge these deficits and stimulate economic growth (Bacha, 1990; Taylor, 1994).

Numerous empirical studies have found that foreign aid failed to promote the socio-economic condition of recipient countries (Brautigam & Knack, 2004; Liew et al., 2012; Rajan & Subramanian, 2008; Teboul & Moustier, 2001). However, some scholars argue that foreign aid positively impacts growth when recipient countries have sound governance with appropriate fiscal, monetary, and trade policies. (Burnside and Dollar, 2000; Shah et al 2023). Meanwhile, other studies have observed that foreign aid has statistically insignificant impacts on development (Birdsall et al., 2005; Boone, 1994; Burnside & Dollar, 2000). Despite several empirical studies, researchers are unable to draw a common conclusion regarding its impact on socioeconomic development. This ongoing controversy motivates us to explore the issue from a new perspective.

The objective of this paper is to examine the impact of foreign aid on income inequality using a novel approach. Most of the existing research on foreign aid and income inequality relies on an aggregated form of foreign aid. While some studies break down foreign aid into categories like loans and grants, none have explored the effects of sector-specific aid on income inequality in the case of Nepal. This paper addresses the question of whether sectoral foreign aid significantly influences income inequality in Nepal and seeks to identify which sector of aid is most effective in reducing income inequality. Thus, the primary objective of this study is to assess the impact of sectoral foreign aid on income inequality and, ultimately, to provide recommendations for policymakers on prioritizing aid sectors that yield the greatest development benefits.

This study contributes to a deeper understanding of the relationship between foreign aid and income inequality by analyzing the impact of sector-specific aid in Nepal. For this purpose, foreign aid is disaggregated into four categories: social sector, economic sector, production sector, and multisector. The analysis employs annual time-series data spanning 2002 to 2023. The Autoregressive Distributed Lag (ARDL) model; Bound test, and Error Correction Model (ECM) are utilized to examine both short-run and long-run impacts. The findings provide valuable insights into the aid-inequality nexus, offering practical implications for academicians, researchers, planners, and policymakers.

This paper is further structured as follows: section 2 reviews the theoretical and empirical studies. Section 3 outlines the model specification and estimation technique. Section 4 consists estimation and interpretation of the result. Finally, section 5 presents the conclusion.

2. Literature Review

Many economic theories emphasize the importance of capital accumulation in fostering economic growth. Foreign aid can accelerate economic growth and reduce income inequality by providing the necessary resources for investment in infrastructure, education, health, and so on. Harrod (1939) and Domar (1946) argued that capital accumulation, whether sourced domestically or externally, contributes to growth. Similarly, Solow's growth model (1956) highlights the significance of the savings rate and capital stock in fostering economic growth. The "Two Gap" model by Chenery and Strout (1966) further explained how foreign aid influences growth, suggesting that insufficient savings and foreign exchange keep developing nations underdeveloped. Additionally, Bacha (1990) and Taylor (1994) pointed out that underdeveloped countries also face a "fiscal deficit," meaning governments lack the funds needed for essential public investments in infrastructure, education, and other critical social sectors. As a result, foreign aid is seen as a means to bridge these gaps and stimulate economic growth.

Numerous empirical studies have examined the relationship between foreign aid and income inequality. Calderon et al. (2006) found no strong correlation between foreign aid inflows and income inequality, even in countries with good institutional quality. However, Bourguignon et al. (2009) discovered that trade barriers, which limit access to developed countries' markets, can negate the benefits of foreign aid. Calderon et al. (2009) later found that foreign aid can improve income distribution when good institutions are present. In contrast, two other studies identified a negative relationship between aid and inequality, though only one of these results was robust (Bjornskov 2009; Layton & Nielson 2008). While the second study showed inconclusive findings, it did suggest a "zero to positive" correlation between aid and inequality (Layton & Nielson 2009). Additionally, aid was found to exacerbate inequality in the short term more than in the long term. More recently, Shaifullah (2011) explored the theoretical perspectives on foreign aid's impact on income distribution and conducted an empirical analysis of 94 countries over 20 years, finding that aid results in modest reductions in inequality.

Previous studies on foreign aid and income inequality typically used aggregate foreign aid figures and found inconclusive results regarding the impact of aid on inequality. In contrast, recent research that examines the

effects of various types of foreign aid on economic growth has yielded more significant findings. Ouattara and Strobl (2008) noted that aggregate aid data can introduce bias because it fails to separate the individual effects of different types of aid on growth. Additionally, Mavrotas (2005) pointed out that the effectiveness of aid coordination can vary from country to country, suggesting that the impact of aid is not uniform across nations. Moreover, Mavrotas (2002) categorized aid to India from 1970 to 1992 into three types—program aid, project aid, and technical assistance grants—and found that all three types had a negative effect on growth.

Hence, there is clear evidence that disaggregating foreign aid data provides more accurate insights than relying on aggregate figures. Analyzing the impact of sectoral foreign aid on income inequality offers a deeper understanding by capturing the specific contributions of each sector. Accordingly, this study investigates the impact of foreign aid on income inequality in Nepal by disaggregating it into four major sectors: social, economic, production, and multisector.

3. Research Methodology

This study uses time-series annual data over the period 2002-2023. The autoregressive distributed lag and Bound test are applied to find short-run and long-run relationships between sectoral foreign aid and income inequality. The study adopted the spirit of Barrow's (1991) model to estimate the effect of sectoral foreign aid on income inequality. The following equation represents the foundational specification for this analysis:

$$Y_t = \alpha_0 + \alpha_1 Aid_t + \alpha_2 X_t + \varepsilon_t \quad (1)$$

Where Y represents the income inequality proxy of the Gini coefficient and data is obtained from the World Inequality Database by the World Inequality Lab. Aid consists of sectoral aid; social sector, economic sector, production sector, and multisector. Aid to the social sector aims to enhance human capital, improve living standards, and reduce income inequality in recipient countries. This includes assistance in education, health, population programs, reproductive health, water supply, sanitation, governance, and civil society, among others. Aid to the economic sector is intended to boost overall productivity, increase investment, and alleviate constraints on public funds for essential investments. This type of aid focuses on sectors such as transportation, storage, communications, energy, banking and financial services, and business services, with the goal of promoting growth and reducing income inequality. Aid to the production sector seeks to expand capital accumulation by increasing resources available for investment. It covers areas like agriculture, forestry, fishing, industry, mining, construction, and trade policies and regulations. Finally, aid to the multi-sectoral category includes support for general environmental protection and other diverse areas, with the aim of reducing income inequality as well. The sectoral aid data is obtained from the Organization for Economic Cooperation and Development (OECD) in the Development Assistance Committee (DAC) and Credit Reporting System (CRS). The data covered both bilateral and multilateral donors. The control variables, denoted as "X," comprise GDP per capita, government expenditure, employment level, and private sector credit. Data for the control variables is sourced from the World Development Indicators published by the World Bank (WB). 'ε' represents the error term while subscripts. 't' indicates years. The variables such as foreign aid with sectoral aid and GDP per capita are transformed into natural logarithms. The summary of the variable's description and sources are presented in Table 1.

Table 1: Variable summary

Variable	Description	Source
Gini coefficient (income shares by top 10%)	The world inequality database measures, the Gini coefficient, which ranges from 0 -1. A Gini closer to 1 indicates higher income inequality, while a value closer to 0 suggests more equal distribution.	WID
Foreign Aid (in log)	Aid refers to official development assistance (ODA) as government aid that promotes and specifically targets the economic development and welfare of developing countries.	OECD
Social sector aid (in log)	Social sector aid includes assistance in education, health, population programs, reproductive health, water supply, sanitation, governance, and civil society, among others.	OECD
Economic sector aid (in log)	Economic sector aid focuses on sectors such as transportation, storage, communications, energy, banking and financial services, and business services.	OECD
Production sector aid (in log)	It covers areas like agriculture, forestry, fishing, industry, mining, construction, and trade policies and regulations.	OECD
Multi-sectoral aid (in log)	The multi-sectoral category includes support for general environmental protection and other diverse areas.	OECD

GDP per capita (in log)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (Current US \$)	WDI
Government expenditure (% GDP)	General government final consumption expenditure (formerly known as general government consumption) encompasses all current government spending on the purchase of goods and services, including employee compensation.	WDI
Employment (% total Population)	The employment-to-population ratio represents the percentage of a country's population that is employed. Employment is defined as individuals of working age who, during a specific reference period.	WDI
Private sector credit (% GDP)	Monetary sector credit to the private sector (% of GDP) refers to the financial resources extended to the private sector, including loans, purchases of non-equity securities, trade credits, and other accounts receivable that create a repayment obligation.	WDI

Notes: 1. The WID, OECD and WDI refer to the World Inequality Database, Organization for Economic Cooperation Development, and World Development Indicators, respectively.
 2. The data can be downloaded from <https://wid.world/data>, <https://data-explorer.oecd.org> <https://databank.worldbank.org>

This study employs the ARDL framework proposed by Pesaran and Shin (1999) and Pesaran et al. (2001). Compared to earlier single cointegration methods, the Pesaran et al. (2001) test offers certain econometric advantages. Specifically, the bounds test approach allows for the capture of both short-run and long-run dynamics, as well as the speed of adjustment between the dependent and independent variables. The embedded Error Correction Model (ECM) is a constrained representation that incorporates cointegration restrictions, making it suitable for use with non-stationary series that are cointegrated. The ECM specification ensures that the long-run behavior of endogenous variables converges to their cointegrating relationships while allowing for diverse short-run dynamics.

The ARDL method offers several advantages over traditional cointegration tests. One key benefit is that it accommodates variables that are either integrated of order I(0) or I(1). However, if any variable is integrated at I(2) or higher, the table values provided by Pesaran and Pesaran (1997) become invalid. This makes the ARDL model more effective in handling small and finite data samples compared to other cointegration tests. Additionally, the ARDL approach allows for identifying different optimal lags for each variable, capturing the data-generation process within a general-to-specific modeling framework (Laurenceson & Chai, 2003).

The generalized long-run ARDL model is specified as:

$$Y_t = \beta_0 + \sum_{i=1}^p \beta_1 Y_{t-1} + \sum_{t=0}^q \beta_2 X_{t-1} + \varepsilon_t \tag{a}$$

The generalized Short-run ARDL model (error correction) model is specified as:

$$\Delta Y_t = \delta_0 + \sum_{i=1}^p \delta_1 \Delta Y_{t-1} + \sum_{t=0}^q \delta_2 \Delta X_{t-1} + \lambda EC_{t-1} + \vartheta_t \tag{b}$$

Where Y represents the dependent variable vector, and X is the regressor. β_0 is the constant, while β_1 and β_2 are the long-run coefficients. The variables "i" denote the number of variables in the model, and "p" and "q" indicate the optimal lag lengths. Δ represents the first difference operator. δ_0 is the short-run constant, and δ_1 and δ_2 are the short-run coefficients. λ represents the speed of adjustment parameter, and EC is the error correction term. ε_t and ϑ_t denote the vectors of short-run and long-run error terms, respectively.

Before applying the ARDL model, the Augmented Dickey-Fuller (ADF) test is conducted to check the stationarity of the data. After obtaining the empirical results, the model's validity is assessed using tests such as the Histogram Normality test, the Breusch-Godfrey serial correlation LM test, and the Breusch-Pagan-Godfrey heteroskedasticity test. Additionally, the Cusum and Cusum of Squares tests are employed to verify the stability of the model.

Table 2: Descriptive statistics

	Mean	Median	Std. Dev.	Max	Min	Jarq.-Bera	Prob.
Gini coefficient	0.42	0.42	0.01	0.44	0.41	2.82	0.24
Foreign aid	974.91	989.57	530.81	1950.07	8.14	0.84	0.65
Social sector aid	462.27	511.06	252.97	956.19	4.00	0.41	0.81
Economic sector aid	224.59	197.13	116.38	436.84	66.60	1.80	0.41
Private sector aid	74.23	78.95	41.47	166.56	20.76	0.95	0.62
Multi-sector aid	87.79	98.80	55.32	193.77	0.48	1.07	0.59

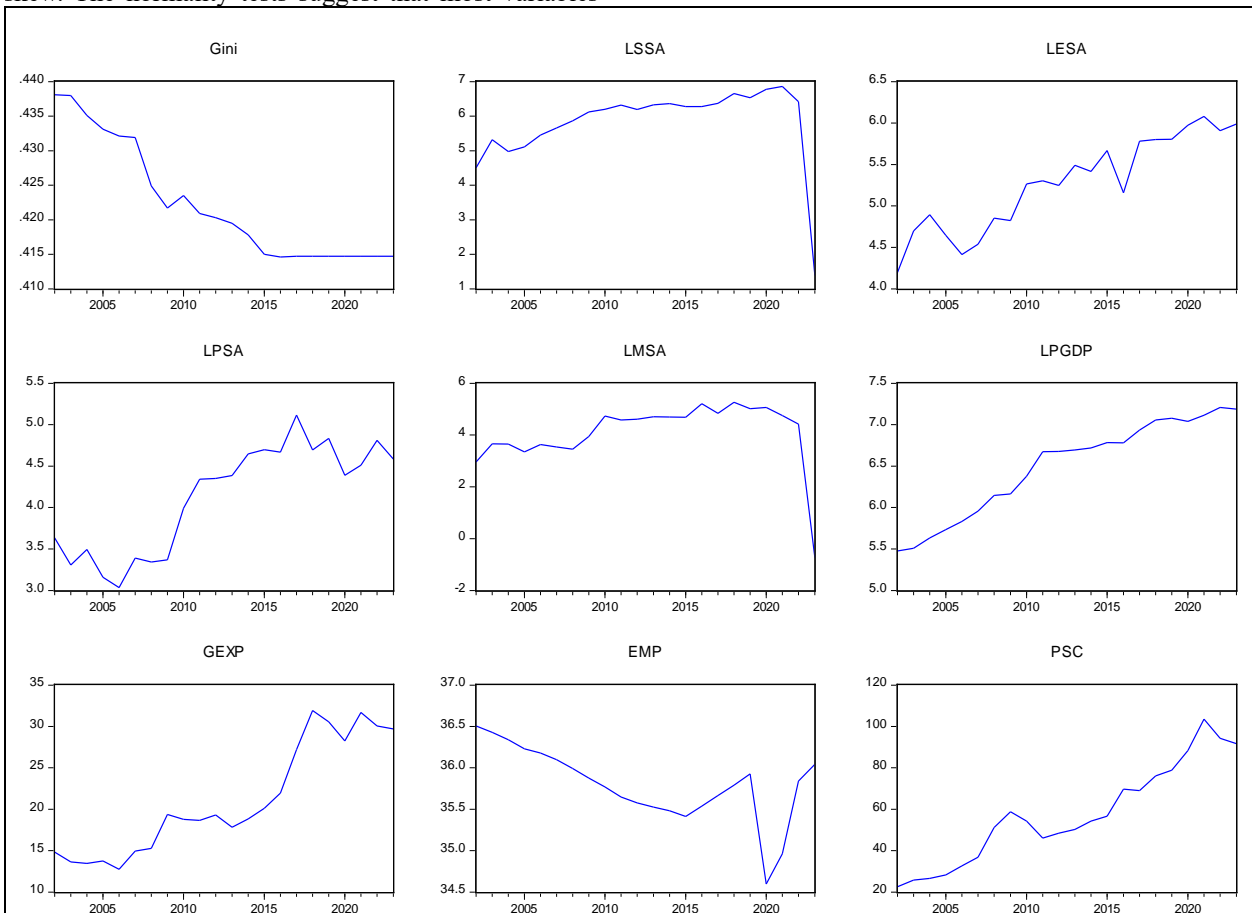
GDP per capita	760.65	801.74	375.51	1348.16	238.86	1.68	0.43
Government expenditure	21.04	19.08	6.71	31.92	12.74	2.28	0.32
Employment	35.79	35.82	0.47	36.51	34.60	2.38	0.30
Private sector credit	57.44	54.22	24.01	103.53	22.51	1.11	0.57

Note: Gini index (0 indicates complete equality, while an index of 100 signifies complete inequality), Foreign aid and Sectoral aid (disbursements in million US dollars), GDP per capita (PPP rates adjusted to constant 2021 international dollars), Government expenditure (% of GDP), Employment (percentage of a country's population that is employed), Private sector credit (% GDP).

Table 2 provides a summary of descriptive statistics variables. The Gini coefficient shows consistent income inequality, with minimal variation, indicating stable inequality levels. Foreign aid including social sector and economic sector aid show moderate variability. The economic sector aid is slightly skewed by high outliers. GDP per capita also displays significant variability, which points to fluctuations in economic growth, though it largely follows a near-normal distribution. Government expenditure exhibits some right-skewness with relatively high variability, while employment is remarkably stable with minimal variation, indicating steady employment levels over the period. Private sector credit displays moderate variability and a slight right skew. The normality tests suggest that most variables

follow an approximately normal distribution, with only minor deviations. Overall, these statistics reveal both stability in certain indicators, such as income inequality and employment, and substantial fluctuations in others, notably foreign aid and GDP per capita, reflecting variability in economic and aid-related factors.

Figure 1. illustrates the trends from 2002 to 2023 for several economic indicators relevant to income inequality, including the Gini coefficient, sectoral aid, GDP per capita, government expenditure, employment, and private-sector credit. The Gini coefficient remains relatively stable with minor fluctuations, suggesting that income inequality levels have not changed drastically.



Note: Gini, LSSA, LESA, LPSA, LMSA, LPGDP, GEXP, EMP, and PSC refer to the Gini coefficient, Social sector aid, Economic sector aid, Production sector aid, Multi-sector aid, GDP per capita income, Government expenditure, Employment, Private sector credit respectively.

Figure 1: Graphical Presentation of Variables (2002-2023)

Meanwhile, social, economic, production and multi-sector aid show gradual increases, indicating rising foreign aid contributions across different sectors. GDP per capita and government expenditure also demonstrate steady growth, reflecting economic development and increased public spending. Employment levels are stable with a slight upward trend, while private sector credit has grown considerably, suggesting expanded access to financial resources. Together, these trends indicate overall economic growth, with potential implications for income distribution depending on how the benefits of these increases are shared across the population.

4. Result and Discussion

The bound test result shows that the F- statistic value ranges from 1.90 to 3.22 lower than the critical upper value I(1). The critical upper bound value is 3.79 at the 5 percent, significance level. This suggests that the null hypothesis of no cointegrating relationship can be accepted. Therefore, the bounds test for cointegration, following the procedure of Pesaran et al. (2001), confirms that there is no long-run relationship between the dependent variable and the set of covariates in all regressions.

Table 3. Bound test

	Model 1	Model 2	Model 3	Model 4	Model 5
F-statistic	3.22	2.61	2.29	1.90	2.78
Lower bound I(0)	2.62	2.62	2.62	2.62	2.62
Upper bound I(1)	3.79	3.79	3.79	3.79	3.79
Remarks	F-stat. < I(1)	F-stat. < I(1)	F-stat. < I(1)	F-stat. < I(1)	F-stat. < I(1)

Note: Model 1 captures the overall impact of foreign aid on income inequality, while Models 2, 3, 4, and 5 examine the impact of aid directed toward the social sector, economic sector, production sector, and multi-sector, respectively, on income inequality.

Table 4. presents the empirical results of short-run dynamics Before interpreting the estimated coefficients, it's essential to review the diagnostic tests. Constant values are positive and significant across all models, indicating a baseline level of income inequality when all other factors are held constant. R-squared values are high (between 0.67 and 0.76), indicating that the models explain a substantial portion of the variability in income inequality. Prob(F-statistic) values are zero in all models, demonstrating the overall significance of each model. Durbin-Watson (D-W) statistics range from 2.14 to 2.50, suggesting that autocorrelation is well-controlled across models.

Table 4. Empirical Results (Short-run Dynamics)

Dependent Variable (Gini coefficient)	Model 1	Model 2	Model 3	Model 4	Model 5
Foreign Aid	-0.0007** (-2.69)				
Social sector aid		-0.0006** (-2.08)			
Economic sector aid			-0.002 (-1.75)		
Production sector aid				-0.0001 (-0.09)	
Multi-sector aid					-0.0009** (-2.77)
GDP per capita	-0.009** (-2.56)	-0.009** (-2.51)	-0.012*** (-3.39)	-0.013*** (-3.21)	-0.009** (-2.75)
Government expenditure	0.0002* (1.81)	0.0001 (1.25)	0.0002* (1.87)	0.0002 (1.70)	0.0002* (2.01)
Employment	-0.001** (-2.39)	-0.001** (-2.02)	-0.001 (-1.61)	-0.0007 (-0.83)	-0.002** (-2.57)
Private sector credit	-0.0001*** (-3.56)	-0.0001*** (-3.41)	-0.0002*** (-3.95)	-0.0002*** (-3.35)	-0.0002*** (-4.37)
Constant	50.58*** (5.49)	0.51*** (5.94)	0.36*** (4.62)	0.34*** (4.22)	0.63*** (5.09)
R- squared	0.76	0.72	0.70	0.67	0.74
Prob (F-statistic)	0.00	0.00	0.00	0.00	0.00
D-W Statistics	2.21	2.14	2.50	2.27	2.23

Notes: 1. The ARDL model (Error Correction form) is selected based on the Akaike Information Criterion (AIC) with the HAC option.
 2. t-statistic are provided in parentheses.
 3. ***, ** and * significant at 1%, 5% and 10 % significance levels, respectively.

Table 4 presents the empirical results from five different models analyzing the impact of foreign aid and

other variables on income inequality in Nepal. Here's a detailed discussion of the findings for each variable and their implications.

Model 1 shows a statistically significant, negative relationship between overall foreign aid and income inequality (coefficient: -0.0007, t-statistic: -2.69), indicating that higher levels of foreign aid are associated with reduced income inequality. This effect is significant at the 5 percent level, suggesting foreign aid may help mitigate inequality in Nepal.

Models 2, 3, 4, and 5 assess the impact of aid directed at specific sectors. Social sector aid has a negative and significant effect on inequality (coefficient: -0.0006, t-statistic: -2.08), implying that aid in social programs (e.g., investment in health, and education) effectively reduces inequality. Economic sector aid shows a negative but insignificant impact on inequality (coefficient: -0.002, t-statistic: -1.75), suggesting its influence on inequality is weaker or inconsistent. Production sector aid has an insignificant effect (coefficient: -0.0001, t-statistic: -0.09), indicating this type of aid does not have a measurable impact on income inequality. Multi-sector aid has a significant and negative impact (coefficient: -0.0009, t-statistic: -2.77), suggesting aid that spans multiple sectors is effective in reducing inequality.

The control variable of the model, GDP per capita has a consistently negative and statistically significant effect on income inequality, with the coefficient ranging from -0.009 to -0.012. This suggests that as Nepal's average income levels rise, inequality tends to decrease, supporting the notion that economic growth is linked to reductions in inequality, possibly through broader income distribution in all models. Government expenditure exhibits a positive coefficient across the models (ranging from 0.0001 to 0.0002), suggesting it may slightly increase inequality. While this effect is significant in Models 1, 3, and 5 (at 10 Percent significance), it remains weak overall, indicating that while government spending has an impact, it is not consistently strong in influencing inequality. Employment has a negative and statistically significant impact on inequality in Models 1, 2, and 5, indicating that increased employment is associated with lower inequality levels. This effect is significant at the 5 percent level in Model 1 and the 10 percent level in Model 2, suggesting that job creation can help reduce inequality in Nepal. Private sector credit is consistently significant and negative across all models except Model 5, indicating that access to private credit may lower income inequality. The negative coefficients (ranging from -0.0001 to -0.0002) suggest that increased private sector credit availability allows individuals and businesses to access capital, contributing to greater income distribution and reduced inequality.

The bounds test confirms no long-run relationship between foreign aid (both aggregated and disaggregated) and income inequality in Nepal. This may be attributed to several factors, including the volatility and

inconsistency of aid flows, limited absorptive capacity and ineffective utilization, potential threshold effects, and other structural or contextual challenges. This result suggests that Nepal should focus on policies that emphasize sustainable development and inclusive growth. This includes investing aid in rural infrastructure, healthcare, and education to improve access and opportunities across regions, as well as supporting the informal sector with access to credit and training. Aligning aid with Nepal's national development goals and working with donors for stable, long-term commitments will ensure a more consistent impact. Additionally, implementing strong monitoring and evaluation will help track aid effectiveness and adjust strategies for lasting inequality reduction.

Foreign aid, particularly when directed toward social and multi-sector initiatives, can help reduce income inequality in Nepal. The positive impact of social sector aid on reducing inequality indicates that mobilized funds for health, education, and social services, benefit low-income populations. Multi-sector aid reduces income inequality in Nepal by addressing inclusive and sustainable development. Environmental protection projects such as community forests, reforestation, renewable energy, etc. create rural job opportunities and also reduce vulnerabilities to climate change. Rural development aids access to better roads, electricity, and communication networks, this aid helps rural populations engage more effectively in economic activities, ultimately reducing income inequality.

In contrast, economic and production sector aid in Nepal, which targets areas like transportation, communications, banking, industry, trade, and mining, has shown weaker and inconsistent effects on reducing inequality. While these sectors are key to fostering economic growth, their benefits often do not reach the most marginalized communities. Infrastructure improvements, for instance, tend to concentrate in urban areas, leaving rural regions with limited access to these advancements. Additionally, the expansion of banking and business services often favors wealthier individuals and large businesses that are better positioned to take advantage of these resources, rather than benefiting the poorer segments of the population. The lack of effective planning and coordination in aid projects can also result in underutilized resources, delaying the intended positive impacts. As a result, economic sector aid struggles to consistently address the root causes of income inequality in Nepal.

GDP per capita growth and employment also have inequality-reducing effects, underscoring the role of economic growth and job creation in improving income distribution. However, government spending shows weaker or inconsistent impacts on inequality. Private sector credit is a crucial tool for reducing inequality, as increased access to credit appears to enhance income

opportunities.

5. Conclusion

This paper contributes to the empirical literature on the relationship between foreign aid and income inequality in Nepal. It examines both the overall and sectoral aid (social, economic, production, and multi-sector) effect on income inequality using time series data over the period 2002–2022 by employing the ARDL estimator. It is robust and flexible in dealing with small sample sizes and allows for the estimation of both short-run and long-run relationships between variables.

The bounds test confirms no long-term relationship between foreign aid (both aggregated and disaggregated) and income inequality in Nepal, likely due to factors such as fluctuating aid flows, limited absorptive capacity, ineffective utilization, and lack of good governance. The findings indicate that foreign aid, particularly when targeted toward specific sectors, can play a significant role in mitigating income inequality. This study supports the findings of prior studies that concluded, different categories of aid have different macroeconomic impacts. The effect may depend on the category and purpose for which it is provided (Mavrotas, 2005; Mavrotas, & Ouattara, 2006a). The study suggests that foreign aid, particularly, social and multisector, demonstrates a positive impact on reducing income inequality by providing vital services to low-income groups and creating rural job opportunities through initiatives like community forests and renewable energy projects. This finding is similar to that of Saidon et al. (2013).

On the other hand, aid directed to the economic and production sectors, including transportation, communications, and banking, has had a weaker, inconsistent effect on inequality. This is due to uneven distribution of benefits, with infrastructure projects often concentrated in urban areas, and economic services favoring wealthier individuals and large businesses. GDP growth, employment, and private sector credit have been found to reduce inequality, but government spending has had less consistent impacts.

The empirical result suggests the need for policies that focus on sustainable development and inclusive growth, with an emphasis on rural infrastructure, healthcare, education, and support for the informal sector. Aligning aid with Nepal's development goals and ensuring long-term commitments from donors could improve aid effectiveness. Policymakers should focus on channeling more aid into social programs and ensure that economic and production sector aid is tailored to support inclusive growth, such as through rural infrastructure and support for small enterprises, to enhance equity across all regions. The findings of this paper may benefit academicians, researchers, planners, and policymakers as it mentions new insight into the aid-

growth nexus. However, further research is advised to identify the role of bilateral and multilateral aid on income inequality in the case of Nepal to capture broader insight.

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