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Contribution of Foreign Aid to the Economic Growth of Nepal

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Abstract

Foreign aid is an important factor for the rapid economic development, growth, and fulfillment of resource gaps in developing countries like Nepal. This paper analyzes the contribution of foreign aid and other foreign inflows of capital like foreign direct investment (FDI) and remittances to the GDP of Nepal. This paper examines the role of foreign aid on the economic growth of Nepal by using secondary time series data from 1996/97 to 2019/20. This paper also used the data series of the same period for trend analysis of foreign aid in Nepal. The secondary data obtained from the World Bank-World Development Indicator has been analyzed using ordinary least squares regression. This paper uses GDP as a dependent variable, foreign aid as a major independent variable, and FDI and remittances as supporting independent variables. The empirical results of this paper prove that there is a positive and significant relationship between GDP and foreign aid inflow to Nepal. The empirical results also prove that there is a positive and significant relationship between GDP and remittances. Similarly, there is also a positive and significant relationship between GDP and FDI.

Keywords: GDP, remittance, FDI, development, resources, impact

Introduction

The term 'foreign aid' is defined as the transfer of money, capital, technology, and other resources from highly developed and middle-developed countries to developing countries. It can be defined as the transfer of every type of resource from developed countries to the least developed and developing countries for the uplift of their socio-economic position. It is the flow of capital and other economic resources from the government of a donor country or international financial institutions to the government of the recipient country (MoF, 2017). The foreigners include every type of resource, like financial resources, technical resources, physical goods, and services.

Foreign aid is the aggregate form of bilateral and multilateral grants, loans, and other technical assistance. Bilateral foreign aid is related to the assistance provided by a country, and multilateral foreign aid is related to the assistance provided by international financial institutions like the World Bank (WB), the International Monetary Fund (IMF), and the Asian Development Bank (ADB).

Foreign aid is an important source of capital for developing countries like Nepal. Pradhan and Phuyal (2020) explains that for nearly 60 years, Nepal has been receiving aid from foreign governments, multilateral organizations, and international nongovernmental organizations a group known as external developmental partners. Foreign aid mainly follows in the form of official development assistance (ODA) from developed countries to developing countries to promote economic development and national welfare (OECD, 2012). Foreign aid is an economic as well as political matter, as the value of foreign aid depends on the political and diplomatic relationship between countries and their relations with international financial institutions. Therefore, it is also known as 'Political Aid'. At the current time, a country cannot be independent. There are unlimited needs for a country in relation to its resources. For the fulfillment of these unlimited needs and desires for economic development, there is a realization of the need for foreign aid. Therefore, there is interdependence between and among the countries.

Aid may be in between developed countries and developed countries, from middle- to middle-developed countries to developing countries. Generally, foreign aid has been provided by developed and middle-income countries to developing countries like Nepal. In developing countries like Nepal, there is mass poverty and unemployment, poor infrastructure facilities, an agro-based and subsistence economy, a huge BOP deficit and trade deficit, low capital formation, a low wage rate, a deficit budget, and a remittance-based economy.

As a result, there is a large gap between demand for and supply of capital in developing countries. In this context, the internal resources of developing countries

can't fulfill the gap between demand for capital and supply of capital. Therefore, it is realized that external support, i.e., foreign aid, is an essential factor for rapid economic development and growth. Foreign aid is provided to the Government of Nepal (GoN) in order to meet the resource deficit in the nation.

In Nepal, official development assistance and development cooperation have been mobilized for almost sixty years. Up until the late 1980s, funding for development primarily came from foreign aid. For instance, foreign aid covered the whole development budget for the first Development Plan (1956–60) (MoF, 2017). The history of foreign aid in Nepal is not very old. Before the pre-democracy period, i.e., 1951, Nepal was not familiar with other countries and foreign aid. After the USA's funding declined in 1951, Nepal formally started receiving international help. Since then, the United States has supported the implementation of projects in almost every economic sector by giving both capital aid and technical assistance (Mishra & Aithal, 2021).. In the past seven decades, there has been a mobilization of official development aid and the Development Corporation in Nepal. It was taken as a major source of development financing until the 1990s. The entire development budget of the first five-year plan (1956–60) was financed by foreign aid (Five-year plan, 2019–20–2023/24). Before 1951, aid was limited only to war-related equipment. There were very few economic activities held through foreign aid before 1951. After the establishment of democracy in 1951, Nepal was recognized on an international level. So, foreign aid in Nepal increased only after 1951 (Economic Survey, 2067/68).

Nepal has been receiving aids from many nations including Switzerland (Mishra & Aithal , 2021). The first foreign aid in Nepal was provided by the British government for the first hydroelectricity project, i.e., the 'Pharping Hydroelectricity Project' in 1912. Another aid was provided by India in 1929 for the construction of 'Railway' from Amlekhgung to Rakshaual of India. The first formal and official foreign aid was obtained from the USA on January 23, 1951, under the 'Point Four Program'. The total foreign aid given by India and the USA was Rs 7 crore and Rs 3 crore, respectively, up to 1956, and thereafter, the volume of foreign aid in the form of grants, loans, goods, services, etc. is continuously increasing (Economic Survey, 2019/20).

Nepal has received a huge amount of foreign aid in the last seven decades. It has received various types of bilateral and multilateral economic support from different donors. Nepal joined the Colombo Plan in 1952, participated in the first non-aligned conference in 1955, and became a member of the United Nations (UN). Due to this, Nepal can attract the interest of various nations in its development efforts. The traditional policy of isolation was replaced by an open market policy. Due to the

improvement in Nepal's international policy, there has been an increase in the inflow of foreign aid from various donors.

Nepal became a member of the World Bank (WB) and International Monetary Fund (IMF) in 1961, and only after 1969 did the WB and IMF start to give aid to Nepal (International Monetary Fund, https://www.imf.org/en/Countries/NPL). After the formation of the 'Nepal Aid Group' in 1976, the volume of foreign aid has increased more significantly in Nepal. In 1990, there was a restoration of democracy in Nepal, and with this political change, again, the volume of foreign aid increased.

In recent days, there has been a high increase in the interest of many developed countries in providing foreign aid to Nepal, as it is located between two large countries, India and China. India and China's' governments have competition for aid to Nepal because they justify their own power. At the same time, the USA, UK, Japan, etc. are also more interested in aiding Nepal. In current days, there are various commitments from different countries for aid to Nepal. Since last year, i.e., 2020, most countries in the world, including Nepal, have been highly affected by COVID-19. In this situation, India, China, the USA, and some other countries are providing various health equipment, including vaccines.

Foreign aid is considered one of the most important tools for economic development, and it has been playing a vital role in the economic uplift of developing countries like Nepal. If there is proper allocation of foreign funds, then it may be beneficial. The productivity of foreign aid also depends on the interests and objectives of donor countries. Therefore, aid recipients' countries, like Nepal, need to have a clear policy, priorities, and strategies for foreign aid. The recipient's government should be aware of reducing the negative effects and unnecessary intervention of donor governments.

Cecen, A et al. (2014) states that Nepal is a landlocked, and India-locked country. With the development of modern technology and international relations, it is gradually converting from a landlocked to a land-linked country with India and China. Nepal lies between the two largest economies and highly populated countries, as China is the largest populated country and India is the second largest populated country. Nepal is taken as a less developed country, but there are many possibilities and prospects for achieving sustainable economic development and a high economic growth rate. On one side, Nepal is recognized as rich in natural resources, and on the other, it is taken as a poor and less developed country. The poor economic condition of Nepal is due to a lack of man-made capital, underutilization of natural resources, and political instability.

In Nepal, there is a huge gap between public income and expenditure, which is justified by the deficit budgetary policy for every year. There are various sources of financing deficit budgets. Out of them, foreign aid is used as one of the most important sources in the context of Nepal. There is no doubt that foreign aid has been playing a crucial role in the economic development of Nepal. The proper and transparent use of foreign aid with public participation will be more beneficial for Nepal. It has developed various physical infrastructures like highways, railways, irrigation projects, buildings, and industries with foreign aid from various countries. There are various problems with the effective use of foreign aid. The major problems for the proper use of foreign aid are the unnecessary terms and conditions of donor countries, a lack of clear-cut government policies, political instabilities, less public participation, a lack of public awareness, and the behavior of political parties.

The donor countries and donor agencies provided loans not in the interest of particular countries but in the interest of themselves. There is a saying that a large amount of foreign aid goes back to donors in the form of equipment imports, compensation to experts, meetings, and seminars. If these types of weaknesses in foreign aid can be minimized, then it will be more productive for developing countries like Nepal. Foreign aid will be more useful for financing the deficit budget of Nepal. A high economic growth rate may be achieved with the proper utilization of foreign aid. Nepal can utilize and exploit natural resources like water, forests, and minerals with the sound use of foreign aid.

Therefore, the main questions in this study are:

1. What is the role of foreign aid in the economic development of Nepal?
2. Either foreign aid is properly utilized or not.

Developing countries like Nepal are rich in natural resources. But the economic growth rate of Nepal and some other developing countries is very low due to a lack of capital and some other constraints. The internal resources of Nepal are not sufficient for the fulfillment of public desires and development activities. Therefore, foreign aid reduces the gap between resources and plays a significant role in the economic development of Nepal. There are various possibilities for high economic growth and development due to the sufficiency of natural resources and the labor force, White Mountain, cultural diversity, and biodiversity. But Nepal is facing the problem of capital, which is somehow solved through foreign aid. In this context, it is essential to analyze the real contribution of foreign aid to the economy of Nepal.

There is a huge amount of capital inflow in the form of foreign aid. The main issues related to foreign aid include its proper utilization and contribution to economic development. The result of this study will be helpful for policymakers, politicians, research scholars, and all other interested people.

The general objective of this study is to analyze the trend of foreign aid to Nepal. The specific objective of this study is to analyze the role of foreign aid in the economic development of Nepal.

Review of Literature

The review of existing previous work related to this study indicates two major views: 'traditional or traditional pro-aid views' and 'radical anti-aid views'. The first view focused on the fact that foreign aid is significantly beneficial for the recipient countries. According to this view, foreign aid is not only a component of an economy but also provides modern technology and managerial skills. On the other hand, the second view concluded that foreign aid creates a significant negative effect on the recipient countries. According to this view, foreign aid substitutes rather than complements domestic resources. These two views have been proven by various empirical analyses. Some of the studies proved that there is a positive effect of foreign aid on the economy, and others proved that it has a negative effect on the economy.

Islam (2006) used the data on foreign aid from 1972 to 1980 in Bangladesh and analyzed it by regression analysis. This study concluded that Bangladesh has received a large amount of foreign aid, but it does not show a significant contribution to growth. This study found that loans are more effective than grants, and aid for food is more effective than other types of aid.

Upadhayaya, Pradhan, Dhakal, and Bhandari (2007) examined the effectiveness of foreign aid and FDI in the Czech Republic, Estonia, Hungary, Latvia, Lithuania, and Poland by using time series data from 1993–2002. This paper concluded that FDI creates a significant positive effect on economic growth, but foreign aid did not seem to have any significant effect on the real GDP of these countries.

Sharma (2011) analyzed the aid effectiveness debate and concluded that Nepal has failed to accelerate growth and reduce poverty and inequality with significant aid recipients.

Tiwari (2011) used the data of 28 South Asian countries and concluded that there is a statistically significant inclusive result about the direction of the import of foreign aid on economic growth.

Fasanya and Onakoya (2012) analyzed the impact of foreign aid on the economic growth of Nigeria by using time series data from 1970 to 2010 and the Cobb-Douglas production function. They concluded that foreign aid positively impacts economic growth in Nigeria. They also concluded that sound policy and good economic management matter more than foreign aid for Nigeria.

Liew, Mohamad, and Mzee (2012) examined the impact of foreign aid on economic growth in east African countries between 1985 and 2010 and analyzed it by the ordinary least squares method. They concluded that there is a negative relationship between foreign aid and economic growth.

Sharma and Bhatarai (2013) concluded that aid is effective with sound economic policy and the presence of a democratic regime. This study was based on an empirical investigation using annual data from 1965 to 2008. This paper explains that Nepal has been one of the biggest recipients of aid among third-world countries. But Nepal remains a poor country.

Cecen, Xiao, and Adhakari (2014) analyzed the dynamics of economic development in Nepal in the context of foreign aid, institutional change, and political instability. They concluded that foreign aid has a positive effect on the economic growth and development of Nepal.

Pandey (2017) analyzed that aid is essential for developing countries like Nepal to fulfill the gap between income and expenditure. Pandey concluded that foreign aid plays an important role in achieving higher and more sustainable development in Nepal, and priority should be based on the potential and needs of Nepal.

Yiew and Lau (2018) concluded the role and impact of foreign aid on the GDP or economic growth by using 95 developing countries as the sample. This paper concluded that foreign aid and economic growth have shaped relationships for 95 countries from 2005 to 2013. That is, initially, there is a negative relationship between aid and economic growth, but over time, there is a positive relationship. This study also included FDI and population as independent variables and concluded that both FDI and population are more important determinants of GDP than foreign aid. This study was based on a regression analysis.

Karki (2019) included the data from 1983 to 2013 and analyzed it using regression analysis. This study concluded that there is a negative impact of aid on per capita real GDP in the short run. But, in the long run, there is a significant positive effect of foreign aid on per capita real GDP.

Pradhan and Phuyal (2020) concluded that there is a positive but not a significant relationship between foreign aid and economic growth. Again, this paper concluded that foreign aid priorities have been shifted from the production to the non-production sector. They concluded that foreign loans are increasing faster than foreign aid, and there is the possibility of a debt burden for future generations. This study included time-series secondary data from 1975 to 2015/16 and was analyzed using regression analysis. This study used GDP as a dependent variable and foreign aid, investment, remittance, and lagged GDP as independent variables in logarithmic form.

Mishra and Aithal (2021) concluded that the real GDP and aid are highly associated. This study was based on secondary data from 2001/02 to 2014/15, with special reference to Swiss aid, and analyzed them by correlation and regression analysis with a normality test. This paper concluded that the Nepalese government should prepare priority projects and request that donors finance these projects for the effectiveness of foreign aid.

Rao, et al. (2023) examined the interrelationship among foreign aid, FDI, and economic growth in East Asia and South Asia from 1980 to 2016 and concluded that foreign aid is negatively related to FDI and growth, while FDI positively influences growth.

The above review of literature proved that foreign aid creates positive as well as negative effects on the Nepalese economy. These studies analyzed the effect of foreign aid on the GDP with some internal and external factors as independent variables. But there is no study for analyzing the effect of foreign aid on GDP with only external factors like FDI and remittances. Therefore, this study has analyzed the effect of foreign investment on the GDP of Nepal with FDI, remittances, and lagged GDP as independent variables.

Methodology

This study has been based on secondary data extracts from the World Bank's Databank. The data has also been collected from the publications of the Finance Ministry, Central Bureau of Statistics, and Nepal Rastra Bank as secondary sources. Therefore, this study has used the desk research methodology based on secondary data. It involves the collection of data from existing sources like the World Bank, the Ministry of Finance, the National Planning Commission, etc. This study covered data from the fiscal year 1996 to 2019 based on the availability of the data. This is because data on foreign aid has been available from 1975 to 2019, but the data on supporting variables FDI and remittances was not available before 1996. This study is mainly based on quantitative data. Therefore, this paper has been analyzed using qualitative methods.

At the same time, some tables and figures were used for descriptive analysis. The data obtained from secondary sources has been analyzed using multiple regression analysis.

This paper has used multiple regression analysis to show the relationship between dependent variable GDP and independent variables foreign aid, FDI, and remittance. This paper has also used various other tests, like the unit root test for testing whether the data are stationary or not, the J-B test for normality, the multi-collinearity test for multi-collinearity between independent variables or not, and the heteroskedasticity test for homoskedasticity or not. The data has been analyzed using STATA software and Eviws software.

Model for Empirical Estimation

The effect of foreign aid on the GDP of Nepal has been analyzed by using the natural logarithm of foreign aid, FDI, and remittances for a specified period as independent variables. For the empirical analysis, the multiple regression model has been used. That is, the regression model has been used to examine the impact of foreign aid and other variables on the GDP. The following regression model has been used to examine the empirical estimation:

$$\ln GDP_t = \alpha_0 + \beta 1\ (\ln Aid)_t + \beta_2(\ln FDI)_t + \beta_3(\ln Remit)_t + \varepsilon_i \ldots\ldots\ldots\ldots\ldots\ldots (i)$$

The regression model without taking logarithms shows that FDI is not significant, and there is also a multi-collinearity problem. The above model, with logarithms, eliminates these problems. Therefore, this model is appropriate for this study.

Here, gross domestic product (GDP) is taken as a dependent variable and foreign aid (AID) as the main independent variable. Foreign direct investment (FDI) and remittance (Remit) are supporting independent variables, and ln represents the natural logarithm. The expected sign of lnAid, lnFDI, and lnRemit will be positive as they will create a positive impact on GDP. There is an increase in capital inflow to an economy with the increase in aid, FDI, and remittances.

Results and Discussion

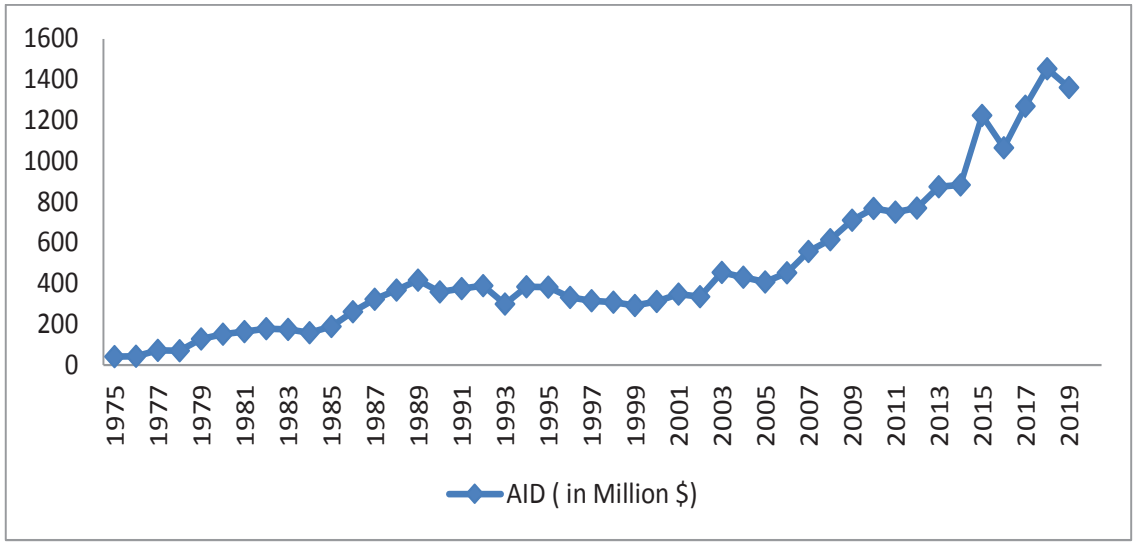
Trend of Foreign Aid in Nepal

Nepal was less familiar with the international sector before 1951 AD. Therefore, there was very limited aid inflow to Nepal, which was basically used for war before 1951 AD. The first formal budget of Nepal was announced in 1952 AD, just after the end of the Rana regime (Economic Survey, 2016/17). After the announcement of the first budget, Nepal enters a new era of financial and economic sector development. Nepal joined the Colombo Plan in 1952 AD and started to receive grants for human

capital. But the volume was very low up until 1975 AD. After 1975 AD, the volume of foreign aid continuously increased up to 2019 AD, but there were various ups and downs in the aid inflow to Nepal. Aid inflow to Nepal was low compared to other countries in the South Asian region, even though there is huge potential for receiving aid. The trend of foreign aid received in Nepal during 1975–2019 has been represented by the following figure:

Figure 1

Foreign aid (in million US dollars)



Source: World Development Indicators, World Bank 2021 (retrieved on August 13, 2021)

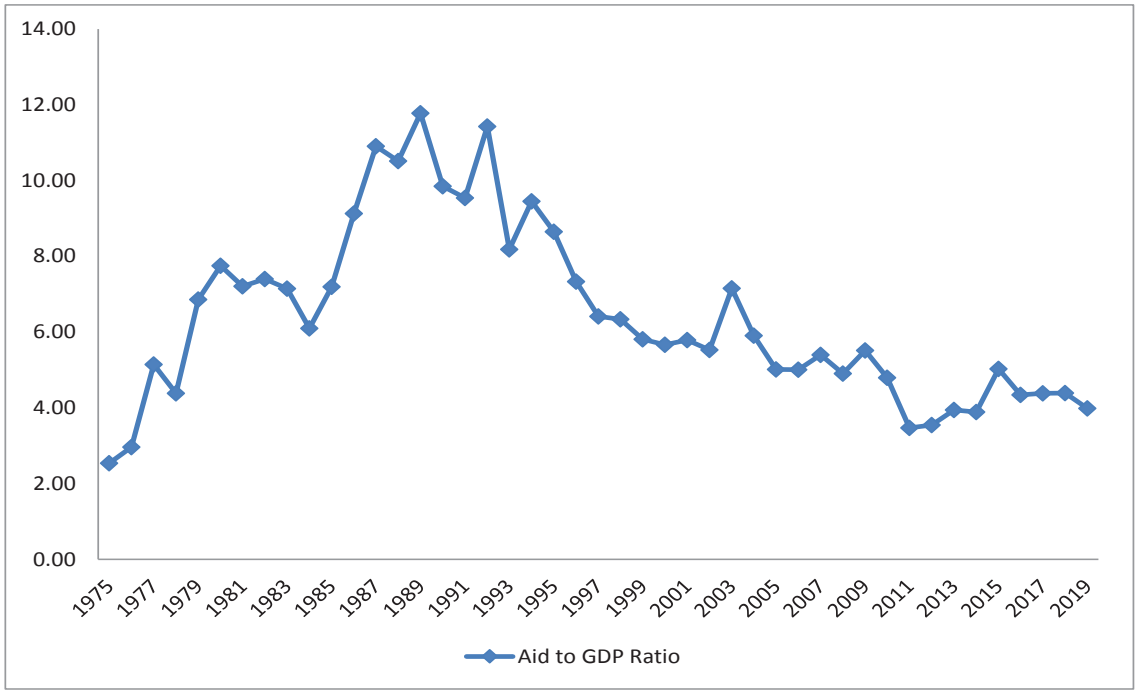
The above figure 1 represents the aid inflow to Nepal from 1975 to 2019. The trend of foreign aid inflow to Nepal has been continuously increasing from 1975 to 2019, with some fluctuations. But the average percentage of aid to GDP is very low, i.e., only 6.39 percent. This figure shows that there was a high fluctuation of aid inflow to Nepal during 2015–2019, and it reached its maximum in 2018.

Aid to GDP Ratio

Nepal lies in between two large economies, India and China, with huge market potential. Foreign aid inflow to Nepal has continuously increased from 1975 to 2019. But the volume of aid is very low in relation to its GDP. The following figure 2 represents the percentage of aid inflow to the GDP of Nepal.

Figure 2

Foreign aid (as a percentage of GDP)



Source: World Development Indicators, World Bank 2021 (retrieved on August 13, 2021)

Figure 2 shows that the percentage of aid to GDP is increasing up to 1990, and it also reaches its maximum at the same time, while there was a public movement for re-democracy in Nepal and the concepts of privatization, liberalization, and globalization emerged. After that, the percentage of aid to GDP continuously decreases with some fluctuations. The average percentage of aid to GDP during this time period is 6.39%.

The following table 1 shows the summary statistics of GDP, AID, FDI, and remit after converting them into millions of dollars.

Table 1

Descriptive Statistics (in Millions of US Dollars)

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	24	14698.427	9743.055	4521.58	34186.181
AID	24	678.258	368.363	292.23	1452.26
FDI	24	46.432	56.916	-6.648	196.265
Remit	24	3068.489	2883.119	44.16	8293.84

This table justify that the GDP ranges from US$ 4521.58 to US$ 34186.181 million and foreign aid ranges from US$ 292.23 to US$ 1452.26 million with US$ 368.363 million deviation. Similarly FDI and remittance ranges from US$ -6.648 to US$ 196.265 million and US$ 44.16 to 8293.84 million respectively. The standard deviation of Aid and Remit shows that there is huge variation and fluctuations. The FDI has less variation but its minimum value is negative.

Unit Root Test

Unit root test is the first step in time series analysis to determine the stationary of variables. It is used to confirm whether each series is integrated and has a unit root or not by using Dickey-Fuller test (DF), Augmented Dickey-Fuller test (ADF) and the Phillips and Perron test (PP). In other words, unit root test is used to determine whether the data series is stationary or not.

If the null hypothesis (Ho) do not rejected then the series is non-stationary and presence of unit root where as the rejection of null hypothesis indicates no unit root and stationary of data series. Similarly, if the absolute calculated value of t-statistics is more than tabulated or critical value of t-statistics at certain level of significance then null hypothesis will be rejected and the data series will be stationary, which is alternative hypothesis. This test has been conducted by using Eviws software. The following table (1) and (2) shows the unit root test of dependent variable GDP and all the independent variables Aid, FDI and Remit at level and first difference with constant and intercept and trend.

Table 2

Unit Root Test Results of Variables: Unit root test at level

Variables	**Test with constant**			**Test with constant/intercept and trend**		
	DF	ADF	PP	DF	ADF	PP
lnGDP	0.0186	0.2130	0.2093	-1.9624	-2.0887	-2.1514
lnAID	0.2716	0.4838	0.5708	-3.5114	-4.0678*	-4.5306*
lnFDI	-2.8136	-1.5712	-1.3817	-5.4863*	-4.3620*	-2.5866
lnRemit	-0.5403	-25.2925*	-2.3654	-1.0769	-10.4464*	-0.5945
Critical value at 5 %	-1.9572	-2.998	-2.998	-3.190	-3.622	-3.622

Table 3

Unit Root Test Results of Variables: Unit Root Test at Difference

Variables	**Test with constant**			**Test with constant/intercept and trend**		
	DF	ADF	PP	DF	ADF	PP
lnGDP	-4.0088**	-3.9218**	-3.8934**	-4.0604**	-3.8606**	-3.8360**
lnAID	-5.6906**	-6.4383**	-6.7742**	-6.7215**		
lnFDI	-4.1458**	-4.3491**	-4.3491**			-4.1480**
lnRemit	-4.4143**		-4.4102**	-5.3759**		-7.2363**
Critical value at 5 %	-1.9572	-2.998	-2.998	-3.190	-3.622	-3.622

(*) means variables are stationary at I(0), and (**) means rest variables are stationary at I(1).

If the calculated value of t-statistics is less than the tabulated or critical value of t-statistics at a certain level of significance with absolute form, then the null hypothesis is not rejected, and the data series is known as non-stationary. The above table 1 shows that the t-values of lnAID, lnFDI, and lnRemit with the (*) symbol for various tests are stationary at I(0), and the rest of the other t-values of all the variables are stationary at I(1), which is indicated by (**) in table 2. The results of other tests for all other variables have been tasted in the first difference, which is shown in Table 2. According to Table 2, all the variables have I(1) for every test as their calculated values are greater than the critical values at the 5% level of significance, respectively. Therefore, it can be concluded that the empirical values are mixed with I(0) and I(1).

The above unit root test proved that some variables are stationary at I(0) and some others are stationary at I(1). Therefore, the ARDL approach of co-integration can be used for the given data set by using Micro-fit (5.50) software. But for the given data set, there are only 24 observations, and out of them, 4 values of FDI at the natural log are missing due to negative net FDI inflow for four years. Due to the lack of enough observation to carry out computations, the ARDL approach can't be used for the given data set.

Regression Analysis between GDP and all the Independent Variables

To calculate the relationship between GDP and foreign aid it is essential to run the ordinary least square (OLS) regression the assumed equation (i), $\ln GDP_t = \alpha_0 + \beta_1(\ln Aid)_t + \beta_2(\ln FDI)_t + \beta_3(\ln Remit)_t + \varepsilon_i$. Some variables were significant and some others like lnFDI was not significant and there was also the problem of multi-collinearity between independent variables without taking lag on lnFDI for the above equation. For solving this problem, one year lag value of lnFDI has been taken for

the significance of all the independent variables and deducting the multi-collinearity problem between independent variables. The following result has been obtained from STATA software:

Table 3
Linear Regression

lnGDP	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
lnAID	.817	.123	6.63	0	.554	1.079	***
L.lnFDI	.062	.021	2.93	.01	.017	.106	**
lnREMIT	.116	.035	3.30	.005	.041	.191	***
Constant	1.41	.734	1.92	.074	-.155	2.976	*

Mean dependent var	10.131	SD dependent var	0.307
R-squared	0.983	Number of obs	19.000
F-test	292.861	Prob > F	0.000
Akaike crit. (AIC)	-61.648	Bayesian crit. (BIC)	-57.870

**** p<.01, ** p<.05, * p<.1*

The above empirical results prove that foreign aid (lnAID) and remittances are statistically significant at less than 1 percent. Similarly, foreign direct investment with a one-year lag (L.lnFDI) is statistically significant at 1 percent or less than 5 percent. Likewise, the constant term is statistically significant at less than 10 percent. The calculated value of F is 292.861, which is greater than 20 or the critical value at 1 percent and 5 percent levels of significance. Therefore, the model is overall statistically significant at 1 percent and 5 percent. The R-squared is the coefficient of determination, which is 0.983. It indicates that 98.3 percent of the variation in the dependent variable lnGDP can be explained by the independent variables. It is justified that the model is statistically good to fit.

The coefficients of all the independent variables are desirable with an expected sign and indicate the positive relationship between dependent and independent variables. The coefficient of lnAID (i.e., β_1) is 0.817, and it indicates that the GDP will increase by 0.817 percent with the 1 percent increase in foreign aid by keeping other things constant. Similarly, the coefficient of lnFDI (i.e., β_2) with a one-year lag is 0.062, meaning that GDP will increase by 0.062 percent with an increase in FDI inflow of 1 percent. Likewise, the coefficient of lnRemit (i.e., β_3) is 0.116, which indicates that the

GDP will increase by 0.116 percent with the increase in remittance by 1 percent. The constant term (i.e., α_0) of 1.41 indicates the autonomous value, which indicates that the GDP will also be determined by other factors besides foreign aid, FDI, and remittance.

J-B Test for Normality Test

The Jarque-Bera-Bera (J-B test) is used to check whether the data series is normally distributed or not. The normality test is a test of the skewness and kurtosis of the data. If the value of skewness and kurtosis is zero, then the data are normal.

Table 4

Skewness and Kurtosis Test

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	adj_chi2(2)	Prob>chi2
e	19	0.817	0.750	0.150	0.925

Table 3 shows that the values of skewness are 0.817 and kurtosis are 0.750, which are near zero. It proved that the used data series is normal or that the data is normally distributed.

Multi-collinearity Test

If the independent variables in a regression model are correlated, then the problem of multi-collinearity arises. The independent variables should be independent, and if the degree of correlation is high, then it creates problems in interpretation. Variance Inflation Factor (VIF) is one of the important methods to test the multi-collinearity test. The starting value of VIF is 1, and there is no upper limit. If the value of VIF is 1, then there is no multi-collinearity. Generally, a value of VIF up to 10 is considered good. The following table 4 shows the VIF of independent variables.

Table 5

Variance inflation factor

	VIF	1/VIF
lnAID	8.384	.119
lnREMIT	7.036	.142
L.lnFDI	1.593	.628
Mean VIF	5.671	.

Table 4 shows that the value of VIF for all the independent variables like lnAID, lnREMIT, and lnFDI is less than 10. Similarly, the mean value of VIF is 5.671, which

is less than 10. The above results proved that there is no multi-collinearity between independent variables.

Heteroskedasticity Test

If the default test generated a P value less than the chosen significance level of 0.05, then it indicates a statistically significant Chi-square test and the presence of heteroskedasticity. Similarly, if the P value is greater than the chosen level of 0.05, then there is the presence of homoskedasticity. The following heteroskedasticity test represents the default result.

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of lnGDP
chi2(1) = 0.11
Prob > chi2 = 0.7452

The above default P value of 0.7452, which is greater than the chosen significant level of 0.05, indicates that there is no problem with heteroskedasticity. It means there is homoskedasticity.

Conclusion

Foreign aid is a major factor in achieving the higher and more sustainable economic growth of least-developed countries like Nepal. This study justified the fact that there is a positive and significant relationship between GDP and foreign aid. This paper shows that the coefficient of lnAID is 0.817, and it indicates that the GDP will increase by 0.817 percent with the 1 percent increase in foreign aid by keeping other things constant. The empirical results of this paper also proved the positive relationship between GDP, FDI, and remittances. It is also proven that all the independent variables, including the constant term, are statistically significant and are positively related to GDP. The coefficient of lnFDI with a one-year lag is 0.062, meaning that GDP will increase by 0.062 percent with an increase in FDI inflow of 1 percent. Likewise, the coefficient of lnRemit is 0.116, which indicates that the GDP will increase by 0.116 percent with the increase in remittance by 1 percent. The constant term is 1.41, and it indicates that the GDP will also be determined by other factors besides foreign aid, FDI, and remittances.

Finally, this paper concluded that the increase in foreign aid reduces the resource gap in Nepal and increases economic activity. The increase in economic activities creates employment opportunities and increases the output of the country. The empirical results show that foreign aid is a more powerful instrument than FDI and remittances to

increase the GDP growth rate of Nepal. But there should be proper use of foreign aid, and it should be received with acceptable terms and conditions.

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Appendix I

Year	GDP(in US$)	FDI(in US$)	AID(in US$)	REMIT(in US$)
1996	4521580381	19160171.09	331339996.3	44160126.07
1997	4918691917	23056467.77	315339996.3	49458057.88
1998	4856255044	12024659.9	307730011	67504902.92
1999	5033642384	4351068.682	292230011	83462780.29
2000	5494252208	-484826.7123	311239990.2	111498192
2001	6007055042	20850000	347820007.3	146985151.9
2002	6050875807	-5952541.127	334500000	678485892
2003	6330473097	14778085.61	452880004.9	771072126.5
2004	7273938315	-417346.3839	429660003.7	822608955.2
2005	8130258041	2451784.707	407230011	1211823253
2006	9043715356	-6647983.904	452510009.8	1453231426
2007	10325618017	5741706.053	556969970.7	1733858518
2008	12545438605	995123.9307	614659973.1	2727140487
2009	12854985464	38271269.97	708989990.2	2983336877
2010	16002656434	87741711.63	767349975.6	3464092682
2011	21621710003	94022157.12	749320007.3	4216894010
2012	21703106502	91954196.1	769679992.7	4792506200
2013	22162208956	74179632.61	873330017.1	5583702128
2014	22731602970	30402676.78	883820007.3	5888650155
2015	24360795410	51895699.93	1224439941	6729935671
2016	24524098184	105996375.6	1064500000	6611838544
2017	28971589213	196265098.6	1269650024	6928133767
2018	33111525183	68186670.75	1452260010	8293840347
2019	34186180695	185554758.7	1360739990	8249503756

Source: World Development Indicators, World Bank 2021

Appendix II

Year	lnGDP	lnFDI	lnAID	lnREMIT
1996	9.655290256	7.282399383	8.520273863	7.645030305
1997	9.691849621	7.362792774	8.498779058	7.694237059
1998	9.686301487	7.080072802	8.488169852	7.829335317
1999	9.701882358	6.638595939	8.465724814	7.921492848
2000	9.739908591	#NUM!	8.493095393	8.047267825
2001	9.778661611	7.319106059	8.54135456	8.167273465
2002	9.781818239	#NUM!	8.524396122	8.831540822
2003	9.801436167	7.169618178	8.655983147	8.887095004
2004	9.861769614	#NUM!	8.633124928	8.915193433
2005	9.91010433	6.389482332	8.609839776	9.083439281
2006	9.956346885	#NUM!	8.65562819	9.162334781
2007	10.01391605	6.759040955	8.745831781	9.239013656
2008	10.09848585	5.99787717	8.788634933	9.435707511
2009	10.10907159	7.582872874	8.850640104	9.474702296
2010	10.20419208	7.943206102	8.884993484	9.539589503
2011	10.33489004	7.973230211	8.874667329	9.624992685
2012	10.3365219	7.963571552	8.886310198	9.680562683
2013	10.34561305	7.870284678	8.941178387	9.746922242
2014	10.35663006	7.482911822	8.946363829	9.770015754
2015	10.38669146	7.715131374	9.087937488	9.828010913
2016	10.38959305	8.025291015	9.027145666	9.82032224
2017	10.46197232	8.292843077	9.103684025	9.840616264
2018	10.51997919	7.833699486	9.162044379	9.918755671
2019	10.53385058	8.268472097	9.133775148	9.916427825

Source: World Development Indicators, World Bank 2021

Appendix III

Year	GDP (in Million$)	AID (in Million$)	FDI (in Million$)	Remit (in Million$)
1996	4521.58	331.34	19.16	44.16
1997	4918.69	315.34	23.06	49.46
1998	4856.26	307.73	12.02	67.50
1999	5033.64	292.23	4.35	83.46
2000	5494.25	311.24	-0.48	111.50
2001	6007.06	347.82	20.85	146.99
2002	6050.88	334.50	-5.95	678.49

2003	6330.47	452.88	14.78	771.07
2004	7273.94	429.66	-0.42	822.61
2005	8130.26	407.23	2.45	1211.82
2006	9043.72	452.51	-6.65	1453.23
2007	10325.62	556.97	5.74	1733.86
2008	12545.44	614.66	1.00	2727.14
2009	12854.99	708.99	38.27	2983.34
2010	16002.66	767.35	87.74	3464.09
2011	21621.71	749.32	94.02	4216.89
2012	21703.11	769.68	91.95	4792.51
2013	22162.21	873.33	74.18	5583.70
2014	22731.60	883.82	30.40	5888.65
2015	24360.80	1224.44	51.90	6729.94
2016	24524.10	1064.50	106.00	6611.84
2017	28971.59	1269.65	196.27	6928.13
2018	33111.53	1452.26	68.19	8293.84
2019	34186.18	1360.74	185.55	8249.50

Source: World Development Indicators, World Bank 2021

Appendix IV

Year	GDP (in US$)	AID (in US$)	lnGDP	lnAID
1975	1575789254	39919998	9.197498	7.601191
1976	1452792989	43009998	9.162204	7.633569
1977	1382400000	71110001	9.140634	7.851931
1978	1604162497	70269997	9.205248	7.846770
1979	1851250008	126959999	9.267465	8.103667
1980	1945916583	150770004	9.289124	8.178315
1981	2275583317	163919998	9.357093	8.214632
1982	2395429852	177229996	9.379383	8.248537
1983	2447174803	174809998	9.388665	8.242566
1984	2581207388	157380005	9.411823	8.196950
1985	2619913956	188360001	9.418287	8.274989
1986	2850784523	260250000	9.454964	8.415391
1987	2957255380	322529999	9.470889	8.508570
1988	3487009748	366660004	9.542453	8.564264
1989	3525228153	415179993	9.547187	8.618236
1990	3627562403	357179993	9.559615	8.552887
1991	3921476085	374029999	9.593450	8.572906
1992	3401211581	388529999	9.531634	8.589425

1993	3660041667	299380005	9.563486	8.476223
1994	4066775510	384160004	9.609250	8.584512
1995	4401104418	380630005	9.643562	8.580503
1996	4521580381	331339996	9.655290	8.520274
1997	4918691917	315339996	9.691850	8.498779
1998	4856255044	307730011	9.686301	8.488170
1999	5033642384	292230011	9.701882	8.465725
2000	5494252208	311239990	9.739909	8.493095
2001	6007055042	347820007	9.778662	8.541355
2002	6050875807	334500000	9.781818	8.524396
2003	6330473097	452880005	9.801436	8.655983
2004	7273938315	429660004	9.861770	8.633125
2005	8130258041	407230011	9.910104	8.609840
2006	9043715356	452510010	9.956347	8.655628
2007	10325618017	556969971	10.013916	8.745832
2008	12545438605	614659973	10.098486	8.788635
2009	12854985464	708989990	10.109072	8.850640
2010	16002656434	767349976	10.204192	8.884993
2011	21621710003	749320007	10.334890	8.874667
2012	21703106502	769679993	10.336522	8.886310
2013	22162208956	873330017	10.345613	8.941178
2014	22731602970	883820007	10.356630	8.946364
2015	24360795410	1224439941	10.386691	9.087937
2016	24524098184	1064500000	10.389593	9.027146
2017	28971589213	1269650024	10.461972	9.103684
2018	33111525183	1452260010	10.519979	9.162044
2019	34186180695	1360739990	10.533851	9.133775

Source: World Development Indicators, World Bank 2021