CHAPTER I

INTRODUCTION

1.1 Background of the Study

Governments, particularly those in developing nations, primarily employ public spending as a tool to encourage economic growth, which is a necessary component of sustainable development. By improving infrastructure, housing, health, and education services as well as agricultural production and food security, economic expansion raises people's standards of living (Loto 2012). Public investment has arisen historically from the need to provide certain goods, infrastructure, or services that are deemed to be of vital national interest. Public investment has tended to increase as a consequence of industrialization and corresponding demands for new infrastructure to facilitate the growth of urban communities. Hence, there is a positive relationship between public investment and growth. (Ghimire, 2021) Economic growth has been one of the central tenets among the theoretical as well as analytical researchers; however, little consensus has been reached on the inquiry into the factors that increase or deter economic growth. After the long term of political instability and the decade of conflict, Nepal is venturing into accelerated economic growth. For accelerated economic growth, transport sector development has been recognized as one of the essential strategies. Transport sector development is an intense work of government since private investors abnegate to invest in transport infrastructure projects due to their long gestation period and due to high start-up costs (Shikha, 2016).

Economic growth is basically an increase or growth on the gross domestic product of a nation. Economic growth is an essential ingredient for sustainable development in any nation. This is because economic growth brings about a better standard of living of the people and is usually as a result of improvement in infrastructure, health, housing, education and improvement in agricultural productivity. There is, however, conflicting evidence in the literature regarding the question as to how the composition of government expenditure affects economic growth. In particular, on the relationship between public investment in transportation and communication (infrastructure) and economic growth, there has been a mixed picture. Aschauer (1989) finds that core infrastructure — streets, highways, airports, mass transit, and other public capital —

has the most explanatory power for private-sector productivity in the United States over the period 1949 - 1985. In a cross-country study, Easterly and Rebelo & (1993) find, using the pooled regressions, that only public investment in transportation and communication (hereafter T&C) among the sectorial components of government investment, is consistently positively correlated with growth with a very high coefficient (between 0.59 and 0.66). On the other hand, Deverajan et al. (1996) find, from the study of 43 developing countries over 20 years, that transport and communication expenditures have a negative correlation with per-capita real GDP growth. Miller and Russek (1997) report that the estimated coefficient for the ratio of transportation and communication expenditure to GDP is positive but not statistically significant for 23 developing countries.

Public spending is the primary tool used by governments, particularly to promote economic welfare, which is a necessary component for sustainable development. This is accomplished by raising the standard of living of the populace by enhancing infrastructure, increasing agricultural productivity, and ensuring food security (Loto, 2012). Maintaining a sufficient level of price stability and a suitable rate of economic growth that will enable the economy to reach its full development potential and stabilize itself is the most important role of government spending (Ndubuisi 2018).

Most of scholars argued that government expenditures on transport and communication sectors such building roads, bridges, railways, airports, tunnel ways and telephone lines, internet facilities, etc. have boosting impact on real GDP of developing counties where people have difficulties to move from one place to another. Efficient infrastructure plays an important role for economic growth. It increases the productive capacity and sustains development. Infrastructure consists of capital-intensive natural monopolies, physical or organizational structures. Most of these systems are owned by government. Economic infrastructures include transportation and communication facilities, particularly physical infrastructures.

Government expenditures are of different categories. Among others, infrastructures expenditures include roads, bridges, rail lines, and similar public works that are required for an industrial economy. According to (Hirschman, 1958) investments includes Direct Productive Activities (DPA) and Social Overhead Capital (SOC). The SOC can be seen as infrastructure and is usually defined as comprising those basic

services without which primary, secondary and tertiary productive activates cannot function.

In Nepal, expenditure of the government grew quickly between 1975 and 2021. In 1975, the overall government expenditure to GDP ratio was 9.1%; by 2021, it had risen to 21.1% (MOF, 2021). Within 45 years, this ratio has more than doubled. The economic development initiatives throughout this time have only produced an average growth rate of 4.3 percent annually. With significant volatility, the capital expenditure portion of overall expenditures decreased from 64.5 percent in 1975 to 18.1 percent in 2021. (MOF, 2021).

1.2 Statement of the Problem

Nepal has been implementing periodical economic plan for economic development since late 1950s. There is increasing trend in government expenditure by every year. The Gross domestic product (GDP) growth rate is substantial if it can deliver economic development. The rate of Nepalese public expenditure is higher than that of nominal growth rate of GDP. There is increasing dependency on foreign loan to fulfill the large requirement of resources for principal repayment and loan interest and to accomplish the increasing resource gap (Barma, 2010).

Nepal, a developing country, has been facing the problems of low development of infrastructure as well as a low volume of gross domestic product (GDP). Infrastructure development plays a vital role in economic development of any country. Sound infrastructure of a country leads to higher and stable economic growth, and the high economic growth helps to develop the infrastructure of the country. Thus, it has long been recognized that the sufficient development of infrastructure service is essential to raise the production and productivity of the country. With the transformation of an economy from public sectors to private-sector involvement after the liberalization, the infrastructure development leads to high economic growth in industrial countries. More investment in the infrastructure development tends to boost output, private investment, and employment,

The relationship between government expenditure and economic growth is an important subject of analysis and debate, especially for least developing countries like Nepal, most of which have experienced increasing levels of government expenditure

over time. The general view is that government expenditure, notably on physical infrastructure or human capital, can be growth-enhancing although the financing of such expenditures, if associated with taxation might be growth-retarding because of disincentive effects. Besides, providing national defense and securities and transfer payments to maintain social welfare and harmony, a government can provide economic infrastructure to facilitate economic growth. Government expenditures on health and education can improve labor force productivity. However, there are also possible negative impacts on economic growth induced by a government's revenue raising and transfer mechanism. The government taxation may produce misallocation of resources as well as disincentives.

In Nepal, overall public expenditure as well as components of expenditures on health, education, physical infrastructures, transport, and social security is rapidly increasing. However, the study on impact of transport and communication expenditures on economic growth is absent. This study will fill this gap. Therefore, the major problem statement is to analyze whether government capital expenditure on transport and communication sectors enhance economic growth in Nepal. In this backdrop, the following research questions were answered:

a) What is the trend of public capital expenditures on transport and communication in Nepal?
b) What is the impact of government expenditure components such as capital expenditures of transport and communication on economic growth in Nepal?

1.3 Objectives of the Study

The general objective of this study is to examine link between government capital expenditures in transport and communication sectors and economic growth in Nepal. However, the specific objectives are:

a) To analyze the trend of transport and communication capital expenditures of Nepal, and
b) To examine the relationship between government capital spending on transport and communication and real GDP in Nepal.

1.4 Significance of the Study

The study gains its significance from the assumption that fiscal policy is on the top of the economic policies, which some researchers hold responsible for a lot of economic successes and failures. Moreover, the Nepalese budget has been suffering from structural and chronic deficit coupled with deterioration in savings and investments rates and a high level of public debt. Recurrent expenditures are sky climbing whereas capital expenditures are falling rapidly. In this context, this study will disclose whether transport and communication capital expenditures are contributing to economic growth or not. The results of the study would guide fiscal policy makers to reallocate scarce budgetary resources toward productive sectors. Besides, historical trend and composition of budgetary components and their classification will reveal past ups and downs and policy shifts regards to overall fiscal policy. Further, historical data trends will gather and tie scattered information within single volume.

1.5 Scope and limitations of Study

The major Scope and limitations of the study are:

i. The study examined only impact of transport and communication capital expenditures on real GDP of Nepal from FY 1990/91 to FY 2020/21 periods. Ordinary least square method of regression was applied to examine the impact of transport and communication expenditures on real GDP.
ii. The study used readymade data sets in analysis regarding expenditure components. If readymade data sets are readily not available, it constructed such data sets with the help of information based red books.

1.6 Outline of the Study

The present study consists of five chapters to make it more systematic. The very beginning part of the study are the preliminaries i.e. the title and others. The first chapter deals with background; statement of the problem; research questions; objectives of the study; rationale of the study; study limitations; and organization of the study. The second chapter presents theoretical framework of the study. This chapter also deals with an extensive review of literature regarding international and national context covering both country case studies as well as cross-country studies.

The third chapter explains research methodology. It includes research design; sample period; sources of data; sample size; estimation procedures; time series properties; data and measurement issues along with detail discussion on specification of models and definition of variables. The fourth chapter describes overall historical trends of economic growth in Nepal. This chapter also explained complete historical story of government expenditures on transport and communication. This chapter is devoted to empirical analysis. The chapter explores the empirical relationship between government expenditure on transport and communication and economic growth in Nepal. The fifth chapter presents major findings, conclusion, recommendations and recommendation for future research. References and appendices are included at the end of the study.

CHAPTER II

LITERATURE REVIEW

2.1 Introduction

The first chapter presented introduction and second chapter surveyed theoretical developments to impact of government expenditures on economic growth particularly focusing to transportation and communication. The third section reviewed empirical studies both international and Nepalese contexts. The final section presents conclusion as research gap in the background of Nepal.

2.2 Literature Review

Economists are currently debating whether or not the government should intervene to stabilize the short-term unpredictability in economic activity. On this strategy, classical and Keynesian economists hold opposing perspectives. While traditional economists thought that labor market adjustments could quickly bring economies to a long-run equilibrium, the Keynesian school (Keynes, 1936) argues that self-regulatory mechanisms are unreliable because of labor market rigidities. The Keynesians use fiscal policies to help the economy during recessions. At both the theoretical and empirical levels, there has been much discussion about the relationship between fiscal policy and economic growth. The focus of public finance has been on governmental spending and national income since the amount of public expenditure has been increasing over time in almost all countries in the world.

Governments need to understand the connection between these two factors as the former are crucial to a nation's progress. The implication is that by raising national income, a rise in government expenditure may have a positive or inverse impact on the expansion of a nation's economy.

Theoretically, Solow (1956) developed an outline on neoclassical paradigm, government policy, and in particular fiscal policy, have no impact on long-run economic growth rate. Because of this, it is dictated by exogenous rates of population increase and technological progress. Neoclassical growth models are sometimes seen

as not especially or, even worse, highly insufficient since they exclude the aspects that underlie long-term growth.

A number of models connecting public spending to the economy's long-term growth rate have been produced as a result of the explosion of endogenous growth research, which has primarily been conducted since the early 1990s. The production function is given in endogenous growth models created by Romer (1986) without diminishing returns. This suggests that anything that has an impact on technology also has an impact on the long-term growth rate of per capita income. In terms of fiscal policy, in contrast to neoclassical growth models, distortionary tax wedges have larger growth consequences. Fiscal policies can therefore be used to improve the efficient allocation of resources by addressing market imperfections and promoting higher levels of capital productivity, both in terms of human and physical.

Endogenous growth models are presented in a very straightforward manner by Barro (1990). His work has proven to be a watershed in the literature on the development of the function of government spending in growth theory. Barro (1990) establishes a positive association between government expenditure and long-term economic growth by allowing for productive public spending, that is, public spending that boosts private capital marginal productivity (infrastructures or property rights). Government spending on public services is seen as an adjunct to private production in his writing.

With a few notable exceptions, the impacts of public expenditure composition on growth haven't been well studied despite their obvious importance. Barro (1990) demonstrates that growth rates decline independent of the level of overall spending when a government raises public consumption (utility enhancing) while reduces public spending (product enhancing). An influential and more contemporary model that focuses on at least two components of public spending is that of Devarajan et al., (1993, 1996). Two productive services (also known as flow variables) are examined by this model's authors in a CES production function. One of these two government spending variables is more effective than the other. If the initial percentage of the new type of expenditure is too large, switching to one that is objectively more productive might not increase the growth rate. The Devarajan et al., (1993, 1996) model illustrates how a change in the ratio of one type of expenditure to the other affects the economy's long-term growth rate. Agenor (2010) demonstrates that shifting money

from wasteful government spending to infrastructure development would increase steady-state growth.

The outcomes of several empirical experiments which is conducted to evaluate the predictions of theoretical models have been very inconsistent. While other studies concludes that overall government expenditure appears to have an unfavorable impact on economic growth, some researchers find a favorable association between government expenditure and economic growth.

Regarding the many categories of public spending, government expenditure on health and education would increase worker productivity. Additionally, government expenditure on communications and road infrastructure would increase the rate of domestic private investment, which in turn promotes economic growth. Barro (1991) stated that spending on defense and education is more comparable to public investment than consumption. These costs are particularly likely to have an impact on private sector productivity with regard to property rights, which is important for private investment. In any case, the empirical data are conflicting. For instance, Baum and Lin (1993) illustrates that government expenditure on defense and education had a positive and statistically significant influence on economic growth, whereas Devarajan et al., (1996) concluded that same expenditures did not have a similarly beneficial effect. Poot (2000) provided evidence of a positive relationship between growth and education spending in a study on the impact of government on long-run growth, but the evidence of a negative relationship between growth and defense spending was only somewhat strong. However, the following two theories were debated in relation to the amount of governmental expenditure and economic expansion.

2.1.1 Wagner's Law

Wagnerians and Keynesians give two opposing perspectives on the connection between government expenditure and economic growth. In accordance with the former, the relationship between public spending and output growth is causal, whereas the latter proposes that during recessions, the relationship between public spending and growth is causal.

German economist Adolf H. Wagner initially proposed a theory on the rise in public spending that depends on the structural development of a society in the second half of the 19th century (Wagner, 1883). He looked at whether there might be a desired cap on the growth of the public sector and came to the conclusion that there couldn't be one. According to him, the growth in national revenue, such as GDP, largely determines the trajectory of public spending over time.

2.1.2 The Armey Curve

The expansion of the economy offers a variety of instruments and methodologies for assessing the government's contribution to the economy. Armey Curve (1995), which was popularized after a discussion on the impact of government expenditure by Republican Senator Richard Armey. Government expenditure and GDP growth rate are correlated along this inverse U-shaped curve. It emphasizes the government's share of the economy and the actual GDP growth rate and is based on the fundamental rule of diminishing returns. Armey put forth the hypothesis that when there is no public sector, economic output is extremely low (theoretically equal to zero). Low levels of public spending make it impossible for the government to ensure that it would uphold private contracts and the protection of property rights, which results in very little growth. As a result of the excessive taxation required to pay such high levels of public spending, on the other hand, citizens do not have enough incentives to invest and produce. Once more, it looks that the growth is incredibly slow. It is reasonable to believe that an increase in public spending will help growth once it has reached low levels. Similar to this, increasing GDP results from beginning with a very high level of expenditure and then reducing it. However, those economies whose resource allocation decisions are a combination of private and governmental decisions show a greater and anticipated level of output.

The literature contains a wide variety of models that describe how too much government expenditure might be detrimental to economic expansion. On the one hand, taxing causes a misrepresentation in the behavior of economic agents, which lowers efficiency. Taxation and distortion will both be higher when spending to finance expenditures is high. On the other hand, from a dynamic perspective, a high tax burden on labor and capital income slows down growth and deters the buildup of physical and human capital.

2.3 Empirical Reviews

There are two basic viewpoints applied to the empirical literature on the linear effect of government expenditure on economic growth. One focuses on how total government expenditure affects economic expansion. The other acknowledges that different government spending initiatives might impact growth in different ways.

The creation of endogenous growth models has made it possible for a new, increasingly growth-relevant composition of public spending. Researchers have just lately begun to analyze how governmental expenditure breakdown affects economic growth. As a result, recent literature seeks to estimate the elasticity of economic growth in respect to various government expenditure items, utilizing both broad disaggregation and the distinction between productive and unproductive spending. The study's primary focus was on government expenditure on transportation, communications, and economic expansion.

2.3.1 International Context

Jan et al. (2012) used Cobb-Douglas production function augmented with index of physical infrastructure to study the relationship between GDP and physical infrastructure. The two variables were discovered to be related over the long term. It made use of the infrastructure for communications, electricity, and transportation to build an index of physical infrastructure using principal component analysis. The findings indicated that communication and infrastructure had a favorable influence on economic expansion.

Olaseni and Lagos (2012) the significance of social and economic infrastructure investment for Nigeria was appraised. The study conducted a theoretical analysis of the infrastructure's state. It demonstrated that inadequate infrastructure investment was caused by a lack of funding, population growth, bad governance, corruption, and economic sabotage. The report made suggestions for enhancing infrastructure. It was argued that infrastructure has a strong relationship to both economic development and poverty reduction. The arguments were based on the existing literature, and there was no empirical analysis. Insufficient money, according to the research, was one of the causes of insufficient infrastructure investment. It suggested raising money for

infrastructure investment. The opportunity costs and viability of shifting money to infrastructure development, however, were not considered.

Srinivasu and Rao (2013) illustrate the degree of infrastructure development spending affected India's economic expansion. The study investigates the impact of infrastructure on India's economic development. According to the descriptive findings, infrastructure has been a key factor in encouraging growth, lowering poverty, reducing inequality, and improving the quality of health and educational services nationwide. Similarly, communication facilities assisted in improving cleanliness and teaching workers how to use the right equipment and techniques in the production sector, which in turn increased the growth of the economy's output.

Abraham and Mike (2014) using time series data from 1981 to 2011 and the ordinary least square (OLS) technique, investigated the effect of government spending on economic growth in Nigeria. They concludes that, with the exception of private capital formation and exchange rate, the explanatory variables total public spending, private capital formation, exchange rate, and the lag value of gross domestic product were statistically significant in explaining the variation in growth.

Soto and Bustillo (2014) analyze the connection between infrastructure spending and economic expansion in Mexican cities. The study examined the effects of infrastructure investment on economic development from 1985 to 2008 using time-series data. The Cobb Douglas production function was utilized in this study's initial investigation of the link between public capital formation and US private sector productivity. This paper used the OLS method for the second stage; the per capita product was used as the explained variable and the explanatory variables were water, drainage, airports, roads, education, and investment. In the long run, the regression analysis revealed that the economic benefit of infrastructure development was widely dispersed over time. Additionally, the differing infrastructural stocks in the various regions had varying effects on the expansion of the Mexican economy. The higher volume of economic growth was caused by a higher volume of infrastructural stock. This study came to the conclusion that Mexico's economy was hampered by a lack of infrastructure.

With the aid of time-series annual secondary data from 1970 to 2013 and the symmetric autoregressive distributed lag (ARDL) estimation technique (Okonkwo and Gods Love, 2015) examined the effect of growth on government expenditure in Nigeria and discovered that it has a sizable impact.

Tripathy et al. (2016) examined the relationship between India's economic growth and gross investment in infrastructure development. We investigated the long- and short-run links between infrastructure investment and economic growth using the Autoregressive Distributed Lag (ARDL) model to co-integration. Gross domestic product was used as a proxy for economic development, and gross domestic formation was used as a proxy for gross investment in infrastructure sectors. Other proxy variables included government revenue, organized sector employment levels in the public and private sectors, employment, inflation, and exports from India. In order to investigate the impact of infrastructure investment on economic growth, time-series data from 1971 to 2012 were employed. Gross investment in infrastructure development and economic growth were found to have a short- and long-run positive and statistically significant relationship, whereas the relationship between inflation rate and economic growth was found to be long-run inverse and statistically significant.

Chengete and Alagidede (2017) examined the growth effects of infrastructure stock and quality in Sub Saharan Africa (SSA). The study used infrastructure stock and quality data for 43 countries in SSA for the period 2000 to 2014. The infrastructures such as electricity, telecommunication (fixed telephones plus mobile phones), roadways, water, and sanitation were used as independent variables and GDP as a dependent variable. Principle components analysis, generalized moments method, and Dumitrescu-Hurlin (D-H) non-causality test were used to investigate the role of infrastructure on GDP per capita growth in SSA counties. This paper found a strong evidence of the positive and significant effect of infrastructure on economic growth in SSA countries. Furthermore, quality effects were found higher in the long-term than in the short-term. Eventually, this study concluded with a unidirectional causality from aggregate infrastructure to growth.

Oladele et al. (2017) investigate the role of government spending on economic development in South Africa using annual data from 1980 to 2014. The data analysis used the co-integration method and the Vector Error Correction Model. The findings of the co-integration test show that government spending and economic growth in South Africa have a long-term link. The VECM result shows a long-term, positive, and significant relationship between economic growth and spending. A large and negative association exists between economic growth and private consumption, while a positive and significant relationship exists between exchange rate and economic growth.

Ejaz et al. (2017) evaluated the effect of public spending on economic growth in Pakistan using time series data from 1982 to 2017. The factors include GDP growth rate, development spending, defense spending, health spending, and education spending. The relationship between public spending and economic growth was examined using the ordinary least square (OLS) test and CUSUM Square tests. There is a considerable beneficial association between development and health expenditures on economic growth, according to the mixed findings of this study. Additionally, there is a negative correlation between spending on defense and education and economic growth. Furthermore, it is advised that public spending be put to good use; if it is not put to good use, the economy of Pakistan would not benefit.

Ndubuisi (2018) investigates how government spending on specific sectors affects productivity in Nigeria. The study included the years 1982 through 2015. The Dickey-Fuller Unit Root Test, Johansen Co-integration Test, and Vector Error Correction Test (VECM) were used to analyze data on government sector spending and productivity. The results showed that the variables were stationary as well as that there were long-term relationships with the economic growth index. Additionally, findings show that administration and transfer spending have a long-term, positive, and considerable impact on the growth index.

Babatunde (2018) seeks to look into how much money the government spends on infrastructure. The study employs both primary and secondary data. The secondary data for Nigeria from 1980 to 2016 includes annual Gross Domestic Products and reported annual investment on specific infrastructure. Unit root and co-integration tests utilizing the Augmented Dickey-Fuller and Phillip-Perron model are the data

treatments applied for the secondary data. The vector error correction model (VECM) was tested on a sample of 37 years annual time series using weighted least square. A sample of 242 respondents is used in the study for the primary data using statistical random sampling. Use of descriptive statistics was made in the data analysis. The study concludes that government spending on transportation and communication, education, and health infrastructure has a large positive impact on economic growth; by contrast, expenditure on infrastructure for agriculture and natural resources had a significant negative impact on economic growth in Nigeria.

Wang et al. (2019) investigated the relationship between urbanization, road infrastructure, and transport energy demand in Pakistan. The autoregressive distributed lag (ARDL) approach to co-integration was used to examine the long- and short-run relationships between dependent and independent variables during the period of 1971 to 2018. The vector error correction model was used to explore a causal relationship between dependent and independent variables. Road transport energy consumption (per capita kilometer transportation of oil equivalent), urban population growth rate, industrial value-added were used as the explanatory variables and GDP per capita as the dependent variable. This study found a positive, and significant, contribution of infrastructure development to the economic development of the nation and a significant positive contribution of urbanization to road sector energy consumption.

Samir and Mefteh (2020) examined the relationship between information and communication technologies (ICT), transportation, and foreign direct investment (FDI) in nations with various income levels from 2000 to 2016 was explored. The study observed how ICT and transportation affected the territorial allure of FDI in host nations. Three separate panels made up of 63 nations have been created globally. The study discovered that these factors had a long-term impact on one another. Across panels, the causation direction varies with varying degrees of significance. Policymakers in both wealthy and developing nations are particularly interested in these empirical studies. They prove the major impact of transport and ICT infrastructures on economic development of host countries through their significant contribution to improve FDI attractiveness. Moreover, the results confirm the positive

role of transport and ICTs in supporting economic growth by strengthening countries' economic openness and increasing their participation in international trade.

Ikubor et al. (2021) evaluate the impact of government spending on infrastructure on economic growth in Nigeria over the years 1981–2019. ARDL model and descriptive statistics are used to examine time series data. The findings indicate that in the short term, government spending on health was significant and negatively correlated with economic growth, whereas spending on education, gross fixed capital formation, transportation, and construction was insignificant. The relationship between government spending on health and economic growth was also significant over the long term, while the other explanatory variables—government spending on education, gross fixed capital formation, as well as spending on transportation and construction—were not significant in explaining the relationship between government spending on infrastructure and economic growth in Nigeria.

2.3.2 Nepalese Context

Kunwar (2019) analyze the causal relationship between public spending and economic growth in Nepal as well as the long- and short-term effects. Time series data were employed in this investigation. To determine if the data are stationary or not, the unit root of the series is tested before beginning data analysis. The link between the variables under consideration is examined using the co-integration test and the enhanced Dicky Fuller unit root test. LNGE with a one-period lag significantly and favorably affects RGDP. RGDP would increase by 34.99 percent at a significance level of 5% if GE increased by 1%. At the one percent level, the coefficient of error correction term (-0.782018) is significant. The presence of a long-term relationship between the variables is strengthened by the error correction term's highly substantial negative sign. However, the rate of adjustment from the RGDP's disequilibrium added to the equilibrium of the current year is only 78.20 percent. It is preferable if the P-value for the Breusch-Godfrey serial correlation LM test, the Breusch-Pagan-Godfrey heteroscedasticity test, and the normality test is greater than 5%. Therefore, autocorrelation and heteroscedasticity are absent from this model. It is normal to distribute the leftover.

Rasaily and Paudel (2019) use annual time series data for the spans between Nepal's fiscal years 1974/1975 and 2017/2018 to examine the effect of government spending on economic growth. The relationship between government spending and economic growth was examined using the Granger Causality test, the Vector Error correction model, and the Johansen Co-integration technique. The outcome demonstrated that government spending and economic growth have a long-term link. Further discovered a short-term association in Nepal between the factors. On the other hand, there was clear evidence that there was no relationship between the individual values of each variable. Without any causality between other variables, current spending and capital spending were found to have a one-way relationship.

Dhungel (2020) looked into the ad hoc relationship between infrastructural development and economic growth using time series data from 1994 to 2018 in Nepal. The Engel-Granger co-integration test and the Error Correction Mechanism (ECM) model were used in the investigation. The findings indicated that gross domestic product and infrastructure factors such total road length, percentage of economically engaged people, percentage of tertiary education enrolment, and gross capital creation co-integrated and had a steady relationship. The country's economic growth was accelerated by the network's expansion, which also improved efficiency and competitiveness in the market.

Ghimire (2021) explains the connection between economic expansion and government spending on Nepal's transportation industry. Time series data gathered between 1975 and 2016 were used in this investigation. The study has made use of statistical and economic analysis methods. The outcome demonstrates that in the Republic system, the tendency of government investment in public expenditures has increased. The results of this investigation show that on the first difference, the variables are stationary. Diagnostic tests show that the generated regression model is adequate (errors are normally distributed, there is no serial correlation, and homoscedasticity). The information explains how capital spending on transportation has a positive and considerable impact on the GDP, which results in economic growth. The findings also indicate a short-term unidirectional causal relationship between transportation capital expenditure and gross domestic product.

Kharel and Adhikari (2021) explore the connections between government spending and Nepal's economic growth using secondary data from 1990 to 2019. The goal of this study was to use simple and multiple linear regression models to examine the effect of government spending on Nepal's economic growth. The study's findings indicate that government spending had a significant or insignificant impact on Nepal's economic growth during the study periods, and they call for increased capital expenditure mobilization for the expansion of development activities in a sensible manner.

Rana (2021) investigates how Nepal's output growth has changed over the course of 45 years, from mid-July 1975 to 2019. A model called the autoregressive distributed lag (ARDL) is used to test long- and short-term correlations between the variables. The empirical findings demonstrate the co-integration of recurrent and capital expenditures with economic growth and their beneficial long- and short-term effects on output growth. Thus, it can be inferred that government spending is one of the main factors in economic development and that, in order to speed up economic growth, more money should be spent on crucial areas like industrial development and infrastructural development.

Giri (2022) examines the impact of Nepal's public spending and economic growth from 1975 to 2021. Using secondary data, descriptive and analytical research methods have been applied. The data was analyzed using the ARDL and ECM models. The study's findings indicated that, at a 5% level of significance, increases in spending on agriculture and education have considerably negative and positive effects on GDP growth, respectively. Spending on communications and transportation, as well as on health, has a positive and a negligible impact on economic growth, respectively. The results of this study showed that raising agricultural spending spurs Nepal's economy's expansion. In order to lessen geographic fragmentation and boost the profitability of private investment as well as by expanding the size of the market, skill, and efficiency of labor, public spending should be best spent for the development of transportation, communication, and social services.

Paudel (2023) investigates how government spending affects Nepal's economic expansion. The methodology used in this study seeks to determine the elasticity of those expenditures in terms of the country's economic growth while taking the

scenario of government budget limits into account when allocating resources to particular sectors. The results from the estimation employing Autoregressive distributed lag (ARDL) approach to co-integration for the data from 1981 to 2020 are threefold. First, both capital and current expenditures in aggregate forms are not the contributors to economic growth unlike our assumption that capital expenditure is more important than current expenditure for economic growth. Second, spending more on education, either in the form of capital or current expenditure, would make a meaningful contribution to accelerating economic growth. Third, the public expenditure in the health sector should be very rational, focusing more on capital health expenditure rather than spending current health expenditure.

2.3 Research Gap

The literature review showed that there is a significant number of studies at the international level but very few studies are available in the case of Nepal. Different research done in Nepal is related with the study of overall expenditure of government like recurrent expenditure and capital expenditure but no research have been found in the specific study of government expenditure on transportation and communication and its impact on economic growth. Therefore, this study tries to bridge this gap by studying the impact of transportation and communication expenditure on economic growth by using time series data from 1990 to 2021.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

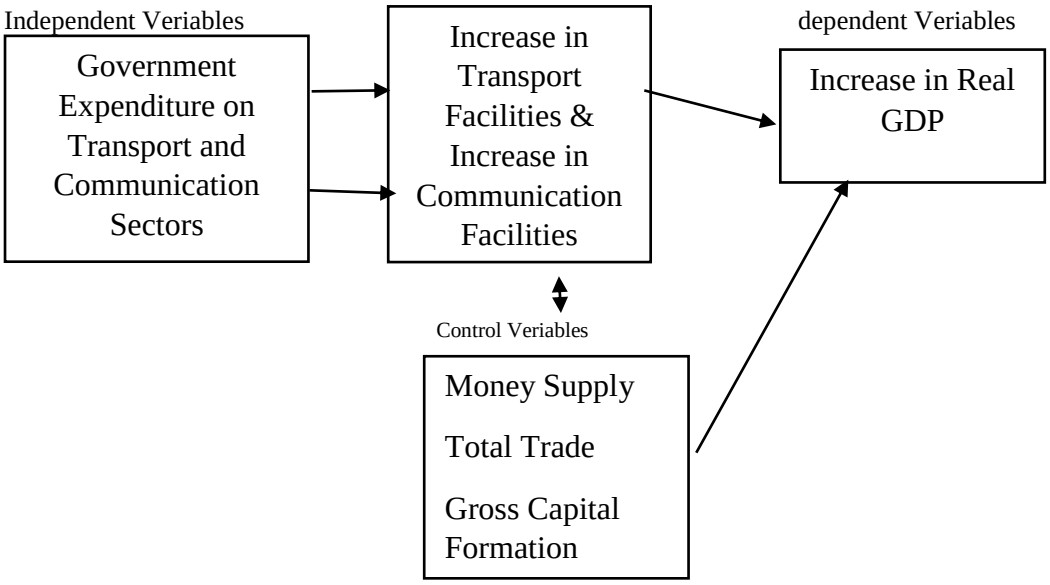
This section presented research design and an overview of the conceptual framework used in this study. The various estimation specification of equations were identified capturing the variables that were to be estimated. Data sources, sample period, different tools and techniques of data analysis used in this study were also outlined.

3.2 Conceptual Framework

The conceptual framework aimed at depicting dependent and independent variables used in the empirical analysis. Economic growth is affected by a number of factors. In this study, real GDP was used as dependent variable to measure economic growth. On the other hand, independent variables included government capital expenditures on transportation and communications. Economic growth is measured as annual real GDP of Nepal and it includes all the goods and services produced within the territory of Nepal for specified year. Similarly, government capital expenditures on transport and communication includes the annual capital expenditures to roads and telecommunication services.

Figure 3.2

Relationship between Transport and Communication and Economic Growth



Real GDP is used as dependent variable, Government Expenditure on Transport and Communication Sectors are independent sector along with Money Supply, Total Trade & Gross Capital Formation are using as control Variables.

3.3 Research Design

The research design consisted of stages of research plan. The research process started from selection of research topic. This study took government expenditures on infrastructures and economic growth in Nepal as study topic which was selected because of increasing government capital expenditures on infrastructure development projects. The study was based on quantitative data. Thus, the research was quantitative in nature based on completely secondary source of data published by domestic institutions.

In the second stage of defining the problem statement and research questions, a thorough analysis of both the theoretical and empirical literature on government expenditures on infrastructures and economic growth was conducted. The comprehensive literature review would guide the study in constructing problem statement, research questions, key objectives and selection of key explanatory variables in context of Nepal.

The third stage involved collecting and managing research data. At this stage, a process of collecting data and important information will be initiated and collected raw data were kept in spread sheet. Sample period and statistical methods was chosen according to availability of data. Data on economic growth and government expenditures on infrastructures such as transportation and communication collected from statistical organizations and institutions such as Nepal Rastra Bank (NRB); Ministry of Finance (MOF); Central Bureau of Statistics etc.

The fourth stage selected data analysis tools and techniques according to availability of data. It prescribed different sets of models. It applied descriptive and ordinary least squares methods of analysis and presentation of data. In the next fifth stage, data were be analyzed and interpreted according to proposed econometric models and conclusions were driven. Results were compared with earlier studies and contradiction on the results were discussed and supported with existing growth theories of government expenditure and economic growth.

3.4 Nature and Sources of Data

The study primarily relied on secondary sources of data. The study used a variety of journals, working papers, study reports, case studies, peer-reviewed articles, books, among others, published by various national and international academic institutions and scholars, along with unpublished theses and dissertations, in reviewing the theoretical and empirical concepts on the relationship between public expenditure and economic growth.

3.5 Data collection Method

3.5.1 Study Area

This study will be an empirical research based on secondary data in order to identify the impact of transportation and communication expenditure on real GDP. Based on the literature review several factors like government capital expenditure on transportation, government capital expenditure on communication, broad money supply, total trade and gross capital formation are taken as the independent variable and real GDP as dependent variable.

3.5.2 Sampling Design

The study based on annual data of different variables from FY 1990/91 to 2020/2021 comprising 31 observations of each because Government of Nepal has allocated large amount of expenditures on transport and communication after 1990. Nevertheless, transport sector expenditures and telecommunication facilities were more clearly realized from 1990 onwards.

3.5.3 Data collection tools

Quarterly Economic Bulletins (Nepal Rastra Bank); Banking and Financial Statistics (Nepal Rastra Bank); Government Finance Statistics (Nepal Rastra Bank); Economic Survey Reports (Ministry of Finance, Government of Nepal); National Accounts of Nepal (Central Bureau of Statistics); Statistical Year Book of Nepal (Central Bureau of Statistics); and Statistical Pocket Book (Central Bureau of Statistics) were the major sources of data and information for the study. Data sets applied for the whole study were kept in the annexes of the study only in the level form.

3.6 Tools of Analysis

For the fulfillment of the objective of the study the graphing technique and Regression analysis has been applied. More specifically for the requirement of first objective, to analysis the trend of transportation and communication capital expenditure on Nepal, the graphical technique is used. On the other side the requirement of second objectives, to examine the relationship between government capital expending on transportation and communication and its impact on Real GDP of Nepal, the technique of regression analysis has been carried out.

3.7 Model Specification

Agenor (2010) has concluded the study to present theoretical that explain how infrastructure investment can contribute to economic growth and development in developing countries, taking GDP as dependent variable & Government Capital Expenditures on Transportation Sector (GCETS), Government Capital Expenditure on Communication Sector (GCECS). as an independent variables along with broad money supply (M2), total trade (TT) and gross capital formation (GCF). The following model has been used for the study.

$$lnRGDP_t = \alpha_1 + \alpha_2\, lnGCETS_t + \alpha_3 lnGCECS_t + \alpha_3\, lnM2_t + \alpha_4 lnTT_t + \alpha_5\, lnGCF_t + \varepsilon_t \quad (3.2)$$

Where, the name of dependent and independent variables used in the above equations from (3.1 to 3.2) and their coefficients expected sign are presented below:

$lnRGDP_t$ = log of Real Gross Domestic Product

$lnGCETS_t$ = log of Government Capital Expenditure on Transport Sector (+)

$lnGCECS_t$ = log of Government Capital Expenditure on Communication Sector (+)

lnM2 = log of Broad Money Supply (+)

lnTT = log of Total Trade (Imports plus exports) (+)

lnGCF = log of (+)

ε_t = stochastic disturbance term.

3.8 Operational Definitions of Variables

To examine relationship between government expenditures on transportation and communication and economic growth following dependent and independent variables were chosen and defined.

Economic Growth: Economic growth is understand as sustained increase in the production of goods & services which have economic value (Kuznets, S. 1947). Using proxy variable as RGDP.

Government capital expenditure on transport sector (GCETS): The capital expenditure on Transportation include capital expenditure made on road ways, railways & airways. Transportation has taken as the key factor to increase and expand economic activities. Therefore the data of capital expenditure on transportation from 1991 to 2021 is taken as independent variables.

Government capital expenditure on communication sectors (GCECS): The capital expenditure on communication sectors include expenditure made on different sectors of communication to made access on fastest communication service inside & outside the nation. Therefore the data of capital expenditure on transportation from 1991 to 2021 is taken as independent variables.

Broad Money Supply M2: Broad Money Supply include currency held by public, Demand deposit & time deposit of BFIs. It is taken as Control variables for this study.

Total Trade TT: Imports plus exports of Nepal from the year 1991 to 2021 is taken as Control variables for this study.

Gross Capital Formation GCF: Gross fixed capital formation includes capital formation mad by public and private sector. the data of capital expenditure on transportation from 1991 to 2021 is taken as Control variables for this study.

All variables of each model are converted into natural logarithms to facilitate the calculation of elasticity and to make it possible the transformation of the non-linear models into log linear one. Basic structures of the transformed variable regarding its central location (mean) and spread (standard deviation) can be presented as a summary statistics. A correlation matrix of estimating variables is estimated to know

how the dependent variable is proportional to all explanatory variables for each model. Durbin-Watson (DW test) is applied to test the problem of serial autocorrelation in the regression equations. Adjusted R-squared and R-squared are used to measure the overall explanatory power of all explanatory variables. To evaluate the overall goodness of models, the F-test is employed.

CHAPTER IV

DATA PRESENTATION AND ANALYSIS

4.1 Introduction

First, this chapter tries to explain about the growth performance and capital expenditures on transport and communication sectors in Nepalese economy employing a descriptive approach between the periods 1991 to 2020. Finally, growth rates time trend of real GDP and capital expenditures on transport and communication sectors are presented in table and line graph. Second, it presents the results of the empirical research for all purposed models in the methodology chapter. It discusses the main empirical findings of this research by analyzing the estimated and computed results. The chapter also presents the results of all diagnostic tests carried out in this study and describes the outcome of the test results.

4.2 Overview of the study

The movement of people and things to the locations of services and facilities is made easier by transportation. Its synergies produce employment opportunities, business prospects, and industrial clusters. The transportation industry in Nepal urgently needs to develop. But because of its location, the country has opportunities and promise. The country's potential is not immediately apparent. Nepal is an island nation. More than 1,000 kilometers separate it from Kolkata, India, which is its closest exit to the sea. Road transportation and aviation are the two most popular modes of transportation in the country due to its frequently tough terrain; the other two are ropeways and one train. Ropeways are currently evolving more as a tourist attraction than a mode of transportation. 472 kilometers of mud roads (new roads) were built in FY 2020/21. Similar to this, during this time 1,190 kilometers of blacktop and 739 kilometers of sectional roads have both been renovated. In addition, 424 kilometers of periodic repair on the 7,187 kilometers of roads that have been maintained regularly or intermittently has been finished. 192 bridges were built throughout this time period and were finished (MOF, 2021/22). According to the study period from 1191 to 2021, total government spending on the transportation industry is growing.

4.3 Trend of transportation and communication capital expenditure of Nepal

Under this sub-heading growth rates and trend of real GDP, size and trend of capital expenditures on transport and communication sectors were discussed.

4.3.1 Size and Trend of Economic Growth

Increase in GDP measures the performance of an economy. GDP is expressed in current and constant prices. The rate of growth in current prices shows higher and much wider fluctuations than those in constant prices because growth rate in current prices contains inflation. Therefore, growth rate in constant prices which is adjusted for inflation is used to access the real performance of the economy. Hence, if real growth rate is high and sustainable, then we can say that the economy is performing well.

This study tries to analyze the growth performance of Nepalese economy using constant figures (Table 4.3.1).

Table 4.3.1

Annual Growth Rate of Real GDP from 1991 to 20201 (Base Year 2000/01 = 100)

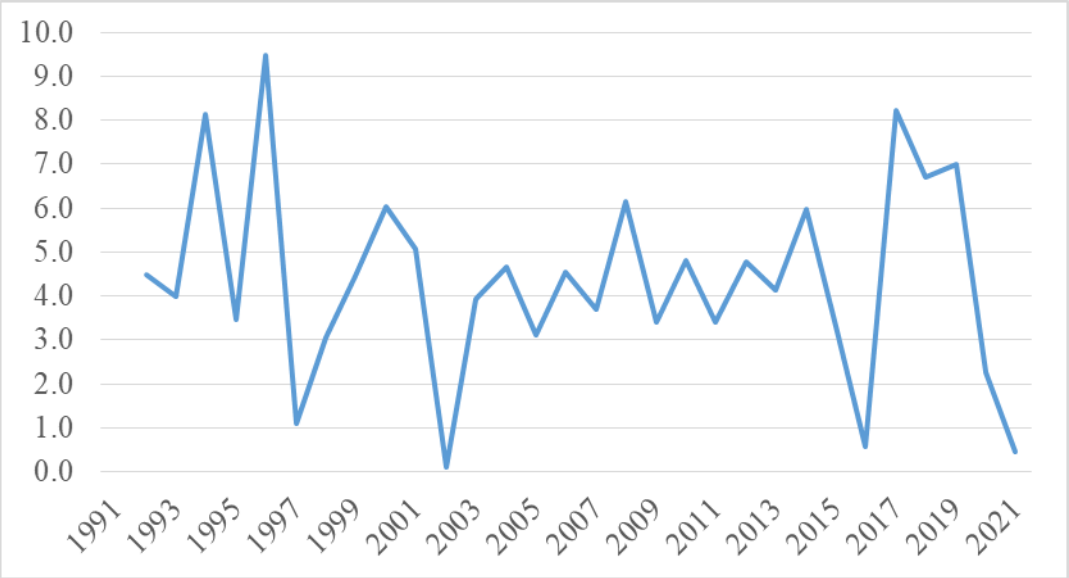
FY	Real GDP Growth Rate (In Percent)	FY	Real GDP Growth Rate (In Percent)
1991		2007	3.7
1992	4.5	2008	6.1
1993	4.0	2009	3.4
1994	8.1	2010	4.8
1995	3.5	2011	3.4
1996	9.5	2012	4.8
1997	1.1	2013	4.1
1998	3.1	2014	6.0
1999	4.5	2015	3.3
2000	6.0	2016	0.6
2001	5.1	2017	8.2
2002	0.1	2018	6.7
2003	3.9	2019	7.0
2004	4.7	2020	2.3
2005	3.1	2021	0.5
2006	4.5	Average	4.2
		SD	2.3

Source: Economic Survey Reports, 2009 and 2022, Ministry of Finance, Government of Nepal

This study tries to analyze the growth performance of Nepalese economy using constant figures. The study presents annual growth rates of real GDP (RGDP) from 1991 to 2021. The annual growth rates of real GDP ranges from 0.1 percent to 9.5 percent in the study period. Average growth rate of real GDP for last 31 years was 4.2 percent with the standard deviation 2.3.

After 1990s, the economy had faced internal armed conflict, regular protection and closers by opposition part, political instability intensified from regular change in the central governments, untimely and uneven monsoon for paddy plantation, corruption and delay in completion of development projects etc. had fluctuated real GDP in Nepal. The fluctuated trends were clearly seen the following Figure 4.3.1.

Figure 4.3.1: Annual Growth Rates Trends of Real GDP from 1991 to 2021



Source: Economic Survey Reports, 2009 and 2022, Ministry of Finance, Government of Nepal

The trend line showed that annual real GDP growth rates were volatile over the study period. There were 15 upward and 15 downward turns within the study period. Economic growth was volatile in Nepal after 1990s because the economy had faced internal conflict of nearly 10 years. Further, agricultural growth was mostly affected by monsoon.

4.3.2 Size and Growth Rates of Capital Expenditure on Transport Sector

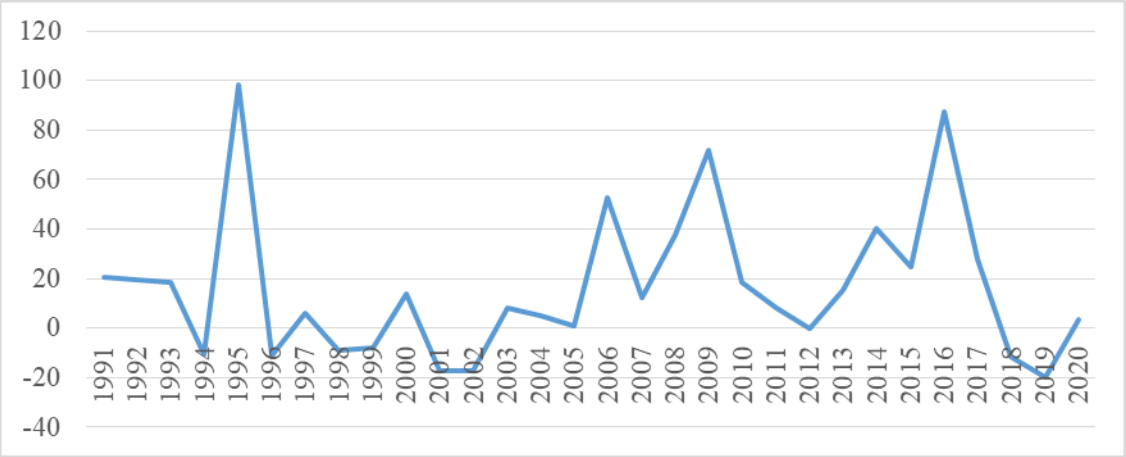
The size of government capital expenditures on transport sector (GCETS) were small but continuously increasing over the study period. Further, the size of capital expenditure on transport did not show continuous increasing trend. Rather, it showed up and down unstable trends. The average size of government capital expenditures on transport sector was 22848.9 million with the standard deviation of 30553.0. The capital expenditures on transport sector were highly volatile over the study period because of political instability, mid-term elections, increase in regular expenditures, large scale increase in internal security expenditures from Maoist Armed conflict, destruction of road sites by monsoon, flood etc. and delay in time of construction of roads from tender consultancies. Further, insecurity and threats from Maoist armed personnel also fluctuated capital expenditures in transport sector. Sometimes, Maoist armed personnel destructed bridges, looted and put fire to the raw materials and vehicles that were used for transport sector construction (Table 4.3.2).

Table 4.3.2: Size of Capital Expenditure in Transport Sector (Rs. in Million)

FY	Capital Expenditure on Transport Sector	FY	Capital Expenditure on Transport Sector
1991	1979.5	2007	6382.1
1992	2381.0	2008	7178.9
1993	2844.0	2009	9893.7
1994	3363.0	2010	17016.6
1995	3010.5	2011	20184.4
1996	5968.5	2012	21847.6
1997	5305.2	2013	21794.9
1998	5619.9	2014	25122.9
1999	5111.3	2015	35248.5
2000	4695.4	2016	44032.5
2001	5354.9	2017	82471.7
2002	4429.6	2018	105590.7
2003	3664.9	2019	93163.8
2004	3958.0	2020	74834.3
2005	4149.6	2021	77539.6
2006	4178.1		

Source: Economic Survey Reports, 2009 and 2022, Ministry of Finance, Government of Nepal. The annual growth rate of capital expenditures on transport and communication sectors is presented in the Figure 4.2.3 below:

Figure 4.3.2: Annual Growth Rates of Capital Expenditures on Transport Sector from 1991 to 2021 (In Percent)



Source: Economic Survey Reports, 2009 and 2022, Ministry of Finance, Government of Nepal

The growth rates of capital expenditures on transport sector was volatile in the study period. The average annual growth rate of capital expenditures on transport sector was 15.7 percent with the standard deviation of 30.0. It has 11 ups and 19 downs in the whole study period.

4.4 Size and Growth Rates of Capital Expenditure on Communication Sector

The size of government capital expenditures on communication sector (GCECS) were small having more instability over the study period. Further, the size of capital expenditure on communication did not show continuous increasing trend. Rather, it showed more fluctuations (Table 4.2.4).

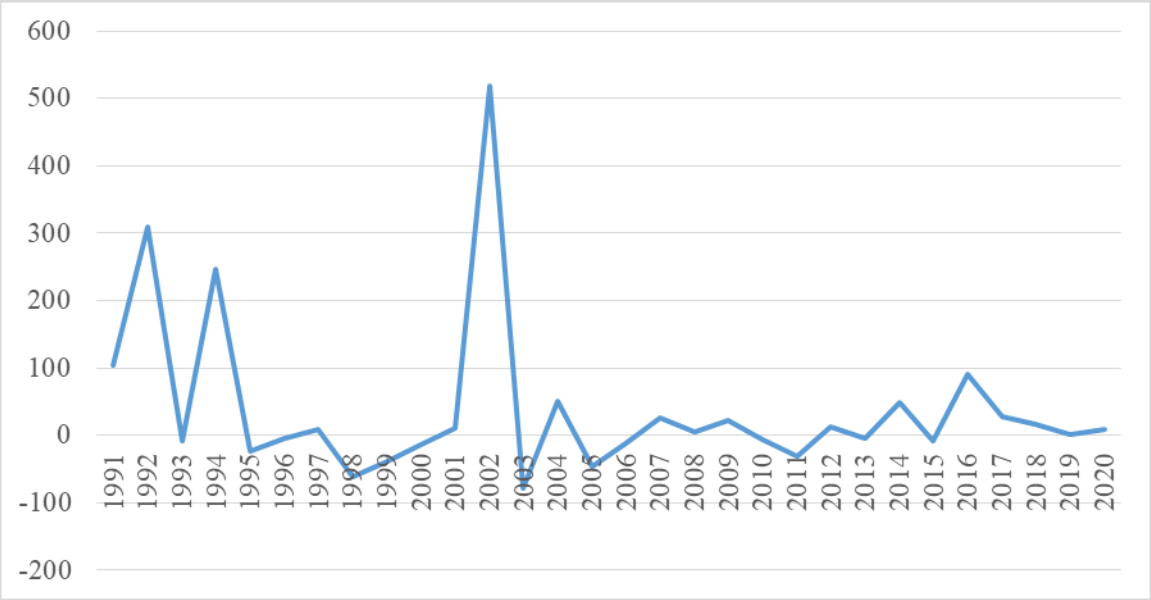
Table 4.4.1: Size of Capital Expenditure in Communication Sector (Rs. in Million)

FY	Capital Expenditure on Communication Sector	FY	Capital Expenditure on Communication Sector
1991	56.7	2007	251.0
1992	116.0	2008	314.0
1993	474.7	2009	330.3
1994	437.6	2010	406.0
1995	1517.8	2011	376.1
1996	1151.7	2012	357.4
1997	1095.9	2013	289.2
1998	1188.4	2014	273.3
1999	466.0	2015	404.2
2000	282.5	2016	366.6
2001	244.0	2017	696.2
2002	271.3	2018	890.7
2003	1680.1	2019	1041.4
2004	356.5	2020	1058.3
2005	536.8	2021	1156.0
2006	283.6	Average	589.4
		SD	431.1

Source: Economic Survey Reports, 2009 and 2022, Ministry of Finance, Government of Nepal.

The average size of government capital expenditures on communication sector was 589.4 million with the standard deviation of 431.1. The data showed that both the expenditures were volatile. The capital expenditures on communication sector were highly volatile over the study period because of political instability, mid-term elections, increase in regular expenditures, large scale increase in internal security expenditures from Maoist Armed conflict, destruction caused by monsoon, flood etc. and delay in time of construction of telecommunication towers from tender consultancies. Further, insecurity and threats from Maoist armed personnel also fluctuated capital expenditures in communication sector. Sometimes, Maoist armed personnel destructed telephone towers, looted and put fire to the raw materials, towers and vehicles that were used for communication sector construction or to link telephone lines to the individual residents and business firms (Figure 4.4.1).

Figure 4.4.1: Annual Growth Rates of Capital Expenditures on Communication Sector from 1991 to 2021 (In Percent)



Source: Economic Survey Reports, 2009 and 2022, Ministry of Finance, Government of Nepal

The growth rates of capital expenditures on communication sector were more volatile in the study period. The average annual growth rate of capital expenditures on communication sector was 37.7 percent with the standard deviation of 120.8. It has 15 ups and 15 downs in the whole study period

4.4.2 Empirical Results on the Effect of Capital Expenditures of Transportation and Communication Sectors on Real GDP

In this sub-section, summary statistics, partial correlation and regression between dependent and independent variables were discussed.

4.4.3 Summary Statistics

The mean, median, maximum, minimum, standard deviation, coefficient of variation, skewness, and kurtosis of each variable under study are included in the summary statistics of the dependent and independent variables. There were 31 observations made during the entire study period. The overall aggregate statistics imply that all

variables exhibit some degree of similarity. Calculated are the variables' logarithmic scale summary statistics. (Table 4.4.4).

Table 4.4.4: Summary Statistics of the Variables in Log Level Form (1991 to 2021)

Descriptive measures/ Variables	LNRGDP	LNGCETS	LNGCECS	LNM2	LNTT	LNGCF
Mean	13.15274	9.193688	6.086980	12.88473	10.14116	9.939308
Median	13.13628	8.664160	5.965882	12.68479	10.00206	9.713997
Maximum	13.78660	11.56733	7.426609	15.25794	11.92877	12.18402
Minimum	12.51931	7.590600	4.037774	10.53775	8.026628	7.827002
Std. Dev.	0.370934	1.193932	0.756743	1.399772	1.071169	1.296815
Skewness	0.021808	0.694638	-0.271971	0.095232	0.003076	0.231195
Kurtosis	1.939186	2.190295	3.357229	1.859760	2.072708	1.850964
Jarque-Bera	1.409036	3.232141	0.529358	1.670530	1.074886	1.917611
Probability	0.494347	0.198678	0.767452	0.433759	0.584240	0.383351
Sum	394.5822	275.8106	182.6094	386.5418	304.2347	298.1792
Sum Sq. Dev.	3.990171	41.33873	16.60715	56.82145	33.27467	48.77016
Observations	31	31	31	31	31	31

Source: Researcher's Calculations

The summary statistics showed that LNRGDP had highest mean of all. The mean of LNM2, LNTT and LNGCF ranked second, third and fourth position. The fifth and sixth position was for LNGCETS and LNGCECS. Among others, the variation measured by standard deviation showed that LNGCF was widely varied. The positive values of kurtosis for all variables suggested that these variables frequency curves are peaked. The positive values of skewness of all variables further indicated that they positively skewed. The JB statistics for each observations showed that individual variables heterogeneous in the sense that some of the variables are normal and some are not normal.

4.4.5 Correlation Results of the Study Variables

Before moving into the cause and effect relationship between dependent and explanatory variables, it would be better to know about their association or strength of relationship. High degree of association between the variables satisfies necessary condition to test the cause and effect relationship of explanatory variables to dependent variable in regression analysis. Log level form of data is used for partial correlation analysis (Table 4.4.5).

Table 4.4.5: Correlation between LNGCETS and LNGCECS with LNRGDP

Correlation	LNRGDP	LNGCETS	LNGCECS	LNM2	LNTT	LNGCF
LNRGDP	1.000000	-	-	-	-	-
LNGCETS	0.928539	1.000000	-	-	-	-
LNGCECS	0.201715	0.270865	1.000000	-	-	-
LNM2	0.997779	0.939649	0.192668	1.000000	-	-
LNTT	0.994911	0.941149	0.243673	0.995371	1.000000	-
LNGCF	0.992777	0.955793	0.215757	0.994001	0.992398	1.000000

Source: Appendix 2

The explanatory variables LNGCETS was high and positively correlated with the explained variable RGDP. However, the association between GCECS was weak but positive. The correlation coefficients of GCETS and GCECS with RGDP are 0.93 and 0.20 respectively. Similarly, the control variables LNM2, LNTT and LNGCF were highly correlated with LNRGDP. Therefore, the pre-condition that explanatory variables should collinear with explained variable is valid for the further analysis. The control variables are highly correlated with dependent variable LNRGDP.

4.4.6 Regression Results

The technique of regression analysis is used for the fulfillment of second objective. Regression analysis is done by taking Real GDP as dependent variable whereas government expenditure on transportation sector, government expenditure on communication sector, broad money supply, total trade and gross capital formation as independent variables. The regression results are presented in the Table 4.4.6

Table 4.4.6:

Ordinary Least Square Regression Results taking RGDP as Dependent Variable

Variables	Coefficients	Standard Error	t-Statistic	Prob. of t-Statistics
LNGCETS	0.095192	0.011641	3.882201	(0.0007)**
LNGCECS	0.004189	0.006259	0.669284	0.5097
LNM2	0.186067	0.038741	4.802804	(0.0001)**
LNTT	0.097741	0.045206	1.056060	(0.0015)**
LNGCF	0.184440	0.013805	2.497858	(0.0007)**
Constant	9.821877	0.075538	130.0261	(0.0000)*
R-squared	0.787489	Mean dependent var		13.15274
Adjusted R-squared	0.776965	S.D. dependent var		0.370934
S.E. of regression	0.020433	Akaike info criterion		-4.766429
Sum squared resid	0.010021	Schwarz criterion		-4.486190
Log likelihood	77.49644	Hannan-Quinn criter.		-4.676778
F-statistic	1906.538	Durbin-Watson stat		1.978943
Prob (F-statistic)	0.000000			

Notes: * and ** denote statistical significance at 1 percent and 5 percent levels.

Source: Researcher's calculation using eviews.

Table 4.6 shows that LNGCETS, LNM2, LNTT are statistically significant at 5 percent level of significance whereas LNGCECS is statistically insignificant. The value of F –statistic is 1906.53 with p-value 0.000. It imply that the overall regression analysis is significant at 1 percent level of significance. The value of R^2 and adjusted R^2 are 0.7874 and 0.7769 respectively which are high. It shows that the variation on dependent variable is best explained by the independent variables of the study. The value of DW statistic is 1.98. The value of DW statistic is near to 2. So, by the rule of thumb, it shows that there is no autocorrelation in result of regression analysis.

The coefficient of GCETS is 0.09. It depicts that one percent increase in the government capital expenditures on transport sector increases real GDP growth by 0.09 percent. The coefficient of GCETS is positive and significant, meaning that increase in the government capital expenditure in transport sector stimulates real GDP in Nepal.

The coefficient of M2 is 0.19 and it depicts that one percent increase in broad money supply increases real GDP growth by 0.19 percent. The coefficient of M2 is positive and significant, meaning that increase in the broad money supply stimulates real GDP in Nepal.

The coefficient of TT is 0.10 and it depicts that one percent increase in total trade increases real GDP growth by 0.10 percent. The coefficient of TT is positive and significant, meaning that increase in the total trade stimulates real GDP in Nepal.

The coefficient of GCF is 0.18 and it depicts that one percent increase in the gross capital formation increases real GDP growth by 0.18 percent. The coefficient of GCF is positive and significant, meaning that increase in the gross capita formation stimulates real GDP in Nepal.

Further, the results showed that the coefficient of government capital expenditure of communication sector on real GDP was insignificant. It might be little size of government capital expenditure in communication sector, or decreasing the role of government capital expenditures on communication sector, or increasing the role private sector in communication sector, particularly from 1990s onwards liberalization policies.

4.5 Discussion of the Results

The economic theory explains that government expenditures on transport and communication sectors such as building roads, bridges, airports, tunnel ways and telephone lines, internet facilities, etc. have boosting impact on real GDP. In many cases as explained in the literature review section for the fulfillment of first objective to analyze the trend of transport & communication capital expenditure of Nepal, the graph has been presented. In other hand for the requirement of second objective to examine the relationship between government capital expending on transport & communication and Real GDP in Nepal, multi regression analysis has been employed. In regression analysis Real GDP is used as dependent variables whereas Government capital expenditure on transportation sector, government capital expenditure on communication sector, board money supply, total trade, gross capital formation are used as independent variables. On the basis of empirical results, the coefficient of government capital expenditure on transportation sector, broad money, total trade and

gross capital formation are statistically significant at the 1 percent level of significance. There is positive effect of government capital expenditure on transportation sector on real GDP. The result is consistence in the line of (Soto & Bustillo, 2014; Tripathy et al., 2016; Chengete & Alagidede, 2017; Babatunde, 2018; Ikubor et.al., 2021; Rasaily & Paudel, 2019; Ghimire, 2021).

The result shows that there is positive impact of gross capital formation on Real GDP the result is identical with result of (Ikubor, et.al., 2021), Dhungel (2020). Similarly there is positive impact of broad money supply and total trade on Real GDP as usual. Former studies indicated that insufficient government investments in communication sector and higher investment of private sector in communication might be the causes less correlation with real GDP. The other cause might be real sector economic activities are not sufficiently linked to communication facilities

CHAPTER IV

SUMMARY AND CONCLUSIONS

5.1 Introduction

This chapter is divided into three major sections. Summary of findings, conclusions, recommendations are presented in different sections.

5.2 Summary

In Nepal, overall public expenditure as well as components of expenditures on health, education, physical infrastructures, transport, and social security is rapidly increasing. However, the study on impact of transport and communication capital expenditures on economic growth is absent. This study will fill this gap. Therefore, the major problem statement is to analyze whether government capital expenditure on transport and communication sectors enhance economic growth in Nepal. Therefore, the general objective of this study is to examine link between government capital expenditures in transport and communication sectors and economic growth in Nepal.

The study applied regression analysis with domestic data sets for the period 1991 to 2021. Data and measurement issues are addressed. Descriptive statistics (average and standard deviation) summary statistics, and partial correlations are carried out along with t, F, R- squared, adjusted R-squared and DW statistics to find out accurate coefficients of estimated regression equation. Major findings derived from the empirical estimation are as follows:

- The annual growth rates of real GDP ranges from 0.1 percent to 9.5 percent in the study period. Average growth rate of real GDP for last 31 years was 4.2 percent with the standard deviation 2.3. The trend line showed that annual real GDP growth rates were volatile over the study period. There were 15 upward and 15 downward turns within the study period.
- The size of government capital expenditures on transport sector (GCETS) were small but continuously increasing over the study period. Further, the size of capital expenditure on transport did not show continuous increasing trend. Rather, it showed up and down unstable trends. The average size of government capital

expenditures on transport sector was 22848.9 million with the standard deviation of 30553.0. The growth rates of capital expenditures on transport sector was less volatile in the study period. The average annual growth rate of capital expenditures on transport sector was 15.7 percent with the standard deviation of 30.0. It has 11 ups and 19 downs in the whole study period.

- The size of government capital expenditures on communication sector (GCECS) were small having more instability over the study period. Further, the size of capital expenditure on communication did not show continuous increasing trend. Rather, it showed more fluctuations. The average size of government capital expenditures on communication sector was 589.4 million with the standard deviation of 431.1.
- The growth rates of capital expenditures on communication sector were more volatile in the study period. The average annual growth rate of capital expenditures on communication sector was 37.7 percent with the standard deviation of 120.8. It has 15 ups and 15 downs in the whole study period.
- The positive values of kurtosis for each variable show that the frequency curves for these variables have peaked. All variables' positive skewness values further demonstrate their positive skewness. According to the JB statistics for each observation, the individual variables are heterogeneous in that some of them are normal and others are not. The overall aggregate statistics imply that all variables exhibit some degree of similarity.
- The explanatory variables government capital expenditure on transport sector was high and positively correlated with the explained variable RGDP. However, the association between government capital expenditure on communication sector was weak but positive. The correlation coefficients of government capital expenditure on transport sector and government capital expenditure on communication sector with RGDP are 0.93 and 0.20 respectively.
- The coefficient of GCETS is 0.09 and it depicts that one percent increase in the government capital expenditures on transport sector increases real GDP growth by 0.09 percent. The coefficient of GCETS is positive and significant, meaning that increase in the government capital expenditure in transport sector stimulates real GDP in Nepal.

- The coefficient of M2 is 0.19 and it depicts that one percent increase in broad money supply increases real GDP growth by 0.19 percent. The coefficient of M2 is positive and significant, meaning that increase in the broad money supply stimulates real GDP in Nepal.
- The coefficient of TT is 0.10 and it depicts that one percent increase in total trade increases real GDP growth by 0.10 percent. The coefficient of TT is positive and significant, meaning that increase in the total trade stimulates real GDP in Nepal.
- The coefficient of GCF is 0.18 and it depicts that one percent increase in the gross capital formation increases real GDP growth by 0.18 percent. The coefficient of GCF is positive and significant, meaning that increase in the gross capita formation stimulates real GDP in Nepal.
- The coefficient of government capital expenditure of communication sector on real GDP was insignificant. It might be little size of government capital expenditures in communication sector, or decreasing the role of government capital expenditures on communication sector, or increasing the role private sector investment in communication sector, particularly from 1990s onwards.

5.2 Conclusions

Government expenditures on the sectors that have higher public utilities but lower profitability are come under government investment sectors. Private sector investments are low in such sectors because of lower rate of profits and long risk periods. Among others, government investments in transport and communication sectors are regarded beneficial in economic growth and development of the country. Therefore, governments are increasing capital expenditures in transport and communication sectors. The empirical result of this study showed that government capital expenditures in transport sector has positive and significant effect on boosting real GDP in Nepal. The result is consistent in line with the former studies Soto & Bustillo (2014); Chengete & Alagidede (2017); Wang, Zhang, & Wang (2019), Shrestha (2010); Sharma (2012); and Dhungel (2020). However the impact of capital expenditures on communication sector appeared inconclusive. Thus, it revealed that capital expenditures on transport sector has positive effect on real GDP in Nepal and real GDP can be stimulated by investing in transport sector, particularly road and bridge building.

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APPENDIX 1

STATISTICAL RESULTS

	LNRGDP	LNGCETS	LNGCECS	LNM2	LNTT	LNGCF
Mean	13.15274	9.193688	6.086980	12.88473	10.14116	9.939308
Median	13.13628	8.664160	5.965882	12.68479	10.00206	9.713997
Maximum	13.78660	11.56733	7.426609	15.25794	11.92877	12.18402
Minimum	12.51931	7.590600	4.037774	10.53775	8.026628	7.827002
Std. Dev.	0.370934	1.193932	0.756743	1.399772	1.071169	1.296815
Skewness	0.021808	0.694638	-0.271971	0.095232	0.003076	0.231195
Kurtosis	1.939186	2.190295	3.357229	1.859760	2.072708	1.850964
Jarque-Bera	1.409036	3.232141	0.529358	1.670530	1.074886	1.917611
Probability	0.494347	0.198678	0.767452	0.433759	0.584240	0.383351
Sum	394.5822	275.8106	182.6094	386.5418	304.2347	298.1792
Sum Sq. Dev.	3.990171	41.33873	16.60715	56.82145	33.27467	48.77016
Observations	31	31	31	31	31	31

Covariance Analysis: Ordinary
Date: 01/10/22 Time: 14:32
Sample: 1991 2021
Included observations: 31

Correlation	LNRGDP	LNGCETS	LNGCECS	LNM2	LNTT	LNGCF
LNRGDP	1.000000					
LNGCETS	0.928539	1.000000				
LNGCECS	0.201715	0.270865	1.000000			
LNM2	0.997779	0.939649	0.192668	1.000000		
LNTT	0.994911	0.941149	0.243673	0.995371	1.000000	
LNGCF	0.992777	0.955793	0.215757	0.994001	0.992398	1.000000

Dependent Variable: LNRGDP
Method: Least Squares
Date: 01/10/22 Time: 14:51
Sample: 1991 2021
Included observations: 31

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGCETS	0.095192	0.011641	3.882201	0.0007
LNGCECS	0.004189	0.006259	0.669284	0.5097
LNM2	0.186067	0.038741	4.802804	0.0001
LNTT	0.097741	0.045206	1.056060	0.0015
LNGCF	0.184440	0.013805	2.497858	0.0007
C	9.821877	0.075538	130.0261	0.0000

R-squared	0.787489	Mean dependent var	13.15274
Adjusted R-squared	0.776965	S.D. dependent var	0.370934
S.E. of regression	0.020433	Akaike info criterion	-4.766429
Sum squared resid	0.010021	Schwarz criterion	-4.486190
Log likelihood	77.49644	Hannan-Quinn criter.	-4.676778
F-statistic	1906.538	Durbin-Watson stat	1.978943
Prob(F-statistic)	0.000000		