

CHAPTER- I

INTRODUCTION

1.1 Background of the Study

Tax is a compulsory or involuntary payment by the people of the society to its government without expecting any return to it. If any individual refuses to pay tax can be punished in the court of law. The imposing of the tax to an individual or the society helps to reduce the inequality as well as promoting economic stability with growth. The major characteristics of tax are that it is the compulsory payment by an individual to the government without expecting any returns. Tax is considered as the major tool of the economic development as it affects the overall structure of the whole economy. The ideas of the taxation is not difficult rather hard to achieve because taxation means the compulsory or the involuntary payment by an individual from its income.

Government collects the revenue from the different sources. Basic source of the government revenue are classified into tax and non-tax revenue. However, the tax revenue in comparison to the non-tax revenue has been playing dominant role in total revenue structure of the government in the least developed country like Nepal. Ample investment is required in social sectors where the private sector of the economy does not to achieve the rapid economic development in least developed country. The private sectors in such countries do not invest in social sectors if they don't find any incentives to engage on it.

In developed countries, the bulk of capital formation takes place through the market mechanism. Nevertheless, such mechanism is proved to provide quick and efficient results only in the presence of a sufficient quantum of capital goods. Evidently for least developed countries, the reliance on such mechanism would be futile since they in general, do not possess even the basic infrastructural facilities such as education, health, power, irrigation, transport, communication, etc. Therefore, the considered opinion is that their government must be responsible for most of the capital accumulation. Thus, the role of taxation in this connection has increased very much in modern days (Rao, 1979).

The discussion on the taxation, its scope and the role of government in an economy has been taking the main issues from the Kautilya's world to modern era. It is one of concerning subject of all the school of thought in economics especially after the 1930's great depression and with starting the age of Keynes. According to Kautilya, Public revenue does not exist for

the pleasure of the king but as a fund to be utilized to augment the wealth of nations. Kautilya admitted the taxation is the main source of revenue. The power of taxing of the state is unlimited but taxation should not be excessive. Kautilya's advocates a mixed economy and argued for a very active role of government. His discussion on taxation gave an idea of three principles i.e. taxation power is limited, taxation should not be heavy and excessive and tax increase should be moderate. He recommends a system of tax collection and public expenditure of revenue in such a way as to build up the permanent revenue yielding capacity of the economy. He said tax base should be augmented not the tax rate (Tanwar, 2014).

However, the classical economists were rooted in the concept of a laissez-faire economic market. The classical economists believed that consumer spending and business investment represents the more important parts in the economic growth of nation. Even though they were in favor of free economy, they also agreed on the minimum role of the government in the economy. But during economic recessions and depressions, individuals and businesses don't usually have the resources as said classical economists for creating immediate results through consumer spending or business investment. The government is seen as the only the force to end these downturns through monetary or fiscal policies providing instant economic results. Thus, Keynesians economists dictate that government spending can take the place of economic growth in the absence of consumer spending or business investment. Keynesian economists often focus on immediate results in economy. So, the policies focus on the short term needs and how economic policies can make instant corrections to a nation's economy. So, after the rising of Keynesian economics in the world Era, the effects of taxation on stability of the economy became an important issue.

Taxation is the major fiscal policy instrument and important government policy tools have an important role in increasing the rate of capital formation and thereby a high rate of economic growth can be achieved. Increase in taxes may be directed to increase in saving through the postponement of consumption. Taxation may also play a dual role. On the one hand, taxation may be used to make the maximum volume of resource available to the public sector. On the other hand, taxation may be used to promote useful investment in the private sector and to prevent the resource from being dissipated over speculative and unproductive investment as well as over lavish and luxuries consumption. Thus, taxes in developing countries are the severe means of raising revenue (Upreti, 2004)

Economic development has been one of the most popular slogans in almost all the developing countries all over the world. Similarly, achievement of high rate of economic growth rate, reduction of income disparities and poverty and improvement of living standard of people are some of the development strategies towards which most of the government's efforts have been directed in developing countries. It is known that government needs more revenue for overall economic development and state welfare. Thus, the government should depend on its own resources for generating revenue to spend its regular as well as development activities.

In the context of Nepal which is situated in South Asia. It is also known as the land of Mt. Everest, the highest peak of the world and the birth place of Lord Buddha. Nepal is a land locked country, which occupies 0.03% and 0.3% land area of the World and the Asia respectively. It has diverse topography length of 885 kilometers and widens from north to south with an average breadth of 193 kilometers (CBS, 2016).

Nepal, a tiny landlocked Federal country is one of least developed countries in world. The per-capita income is just \$853 (MOF, 2016/17) indicating low income, low saving, low investment and low economic growth rate, growing unemployment led the country to low level of income, low saving, and low domestic saving ratio. These types of vicious circle push the country towards poverty in which the situation demands the strong government roles in the economy. For this, government needs the strong sources of finance. One of the important sources of government revenue is the taxation.

In Nepal, taxation cover the two third of the total revenue. Tax revenue is one of the most important sources of the government revenue. Tax revenue is regarded as the money that is to be paid by the public to the government of the state according to the law. The main objective of tax revenue is to collect more revenue for the welfare of the state. Nepal's tax structure is composed of three categories of revenues. These are Direct taxes, indirect taxes and Non-taxes. The structure is heavily dominated by indirect taxes that still contribute more than sixty percent of the total revenue while direct tax and non-taxes contribute only around twenty percent of the total revenue (MoF, 2016/17). The major components of direct taxes comprises of income tax and wealth and capital gain tax. The premium indirect taxes constitute value added tax (VAT), excise duties and custom duties (NPC, 2016).

In Nepal imposition of tax seems to have started in the Lichhibi era. Three types of the revenue used to be collected by government at that time (Aryal, 2010). The concept of income tax for the first time was brought in 2008 BS by the first government formed after

establishment of democracy. The first elected democratic government formed after establishment of democracy. The first elected democratic government converted this concept into law through finance act which had provision to impose tax on trade, profit and remuneration. It has been about fifty years since tax law into force i.e. enforcement of Trade, Profit and Remuneration Tax Act 2017 in Nepal. Income tax act as a separate act was first time enforced in 1962 AD. Administration structure for management of government revenue i.e. department of tax was also established in the same year. Income tax act 2031 is treated as the act which has respected modern philosophy of tax. Income tax act 2002 is modified version of income tax act 2031 which was made as per the international standard. Tax administration refers to the management of tax related matters. Income tax act 2002 has provision of Inland Revenue department (IRD) which is the central public agency to work on the issues of income tax, Value Added Tax (VAT) and the excise duty in Nepal. Other departments, department of custom, department of revenue administration, department for investigating money laundering and revenue administration training centers are other important departments whose primary responsibility is not to work for IRD however their work in much extent supports effective implementation of income tax law also. Office of financial comptroller general is another department like structure under ministry of finance which is central internal auditing authority of government.

Government of Nepal collects revenue from tax and non-tax sources. Tax is key source for revenue mobilization. The economy of Nepal can be characterized by a low revenue performance in contrast to the growing public expenditure. Growth of revenue is not able to maintain a pace with the expenditure growth. The composition of government revenue from 1990 to 2016 will be presented in this study to examine the trend and structure of the taxation and also to explore the productivity of taxation and its burden during the study period.

1.2 Statement of the Problem

Economic Growth and Development is one of the popular slogans in almost all the developing countries all over the world. Similarly, accelerating of high rate of economic growth with reduction of poverty and income inequality by improving the living standard of the people are some of the development strategies towards which most of the government's effort have been directed in developing countries (Parajuli, 2009). The subject of taxation has undergone an extensive metamorphosis since last many years. With the advent of supply side economics the role of taxation has become even more crucial. Taxation is not only an effective instrument for resource mobilization-a 'boost trap' operation for financing

economic development-but also a tool-kit for revenue collection to sustain growth and maintain equity and stability in the economy. In developing economies resource gap is critical and widening resulting to huge fiscal and budgetary deficits over the years. Same holds true in Nepal. The growing resource gap is frequently off-set by mobilizing internal and external borrowing and consequently shifting the burden of debt to posterity. Therefore, revenue mobilization is a challenging proposition in an economy like Nepal where a majority of the people live in abject poverty and the people engaged in economic activities have extremely limited taxable capacity. In addition, legal base of taxation is compressed with unlimited tax shelters and tax administration lacks innovative mechanism to identify new taxpayers and bring them into tax-net. In recent years, unsanctioned economic activities have greatly increased resulting to poor voluntary compliance due to indifferent attitude of the tax payers towards government spending. Nepal's tax system is trapped into diminishing efficiency of tax administration and increasing delinquency on the part of taxpayers (Dahal, 2009).

The share of tax to the total revenue stood at 93.18 percent while the share of non-tax revenue stood at only 6.82 percent with revenue mobilization of Rs. 481.96 billion in the FY 2016/17. The shares of tax to the total revenue mobilization from the FY 2012/13 to 2014/15 remained close to 88 percent while such shares are increased to remain at 93.18 percent in the current FY 2016/17. Tax revenue and non-tax revenue contributed 87.37 percent and 12.63 percent respectively to the total revenue in FY 2015/16. Such contribution stood at 87.70 percent and 12.30 percent respectively in FY 2014/15. Due to this, it is seen that the contribution of tax on total revenue of the government revenue has increased in the current fiscal year. Similarly, the contribution of goods and services tax has attained the top position in the tax revenue collected between 2012/13 and the current fiscal year with about 44.03 percent on average to the total revenue. During this period, contribution of income, profit and capital gains tax and foreign trade based tax to total revenue remained close to 23.68 percent and 17.05 percent respectively. The share of property tax in the form of direct tax to the total revenue collected in fiscal years from 2012/13 to 2014/15 remained below 2 percent while such went up 2.3 percent in FY 2015/16 (MoF, 2016/17).

However, the revenue mobilization in Nepal is still weak because the economy of Nepal has been suffering from various problems like resource constraint, rapid growth of population, higher dependency on agriculture, lack of revenue surplus for government to the development, increasing reliance of foreign loans, aggressive dependence on remittance,

domination of indirect taxes to direct taxes and widening resource gap. Hence, in Nepal, the resource gap has been increasing rapidly day by day. But there is a fluctuation in the increasing trend of resource gap indicating that it is necessary to mobilize additional domestic resource and best measure to fulfill the resource gap is to increase public revenue through effective tax system.

In the context of Nepal, there is no doubt to say that the tax system/ tax revenue plays major role to mobilize internal resource because it contributes largely to the total government revenue. The basic sources of the government revenue are tax revenue which is comprises direct taxes, indirect taxes and non-taxes. The several previous studies showed that the Nepalese tax system is in vicious circle of problems like lack of simplicity, transparency, competitiveness in the tax system, limited tax base and tax laws are rigid and complex. Tax evasion and leakages is another problem of the Nepalese tax system. The existing situation of the leakages in Nepal is very alarming. The estimated evasion is more than 40 percent of taxable capacity (Ghimire, 2006).

Weak tax administration is often pronounced as a major threat for a good tax system in Nepal. Poor tax administration imposes additional burden and uncertainties. Uncertainty is heightened by increasing recourse to taxation through flat charges without direct regard to the profitability of investment from a taxation standpoint; the foreign investors may not feel that there is a welcoming environment. There is a tendency of providing tax rebate and exemption by reforming sectorial laws and cabinet decisions, tax personnel do not exhibit tax payers friendly behavior and lack of advanced information technology that is compatible with international standards are some of the problems in tax administration in Nepal. These problems are increasing tax collection expenditure and technology and tendency of tax evasion as well. Therefore, it is a big challenge to develop in appropriate strategies for taxation by ensuring effective resource mobilization in order to reduce the acute resource gap.

Thus, this study tries to analyze the structure, trend, productivity and burden of taxation in Nepal by using the data from 1990 to 2016 including the following research questions:

1. What is the trend and structure of taxation in Nepal?
2. What are the elasticity and buoyancy of Nepalese taxation?

1.3 Objectives of the Study

The general objective of this study is to find out the scope of taxation for the growing expenditure in the recent in Nepal by using the data of 1990 to 2016. The Specific objectives of this study are as below.

1. To examine the trend and structure of taxation in Nepal,
2. To find out the elasticity and buoyancy of taxation in Nepal.

1.4 Significance of the Study

Taxation has a crucial role in fiscal policy implementation, especially in developing countries where the demand of public funds for public expenditure is high. It is a better source of resource mobilization than other sources such as deficit financing and money creation. Tax revenue is the major source of domestic revenue in Nepal.

Taxation is one of the dominant major sources of the government revenue. It contributes more than 80 percent of the total government revenue in Nepal. However, there is the tremendous scope of tax system in Nepal. Due to the lack effective government, regulation and research in field of taxation, the revenue mobilization in an unsatisfactory level in Nepal and the contribution of taxation is not achieved in required level as expected.

Taxation can play an important role in the process of development in developing countries like Nepal which needs higher revenue to fulfill various responsibilities. Elasticity and buoyancy of taxation are measured the response of tax revenues to changes in the GDP. If the taxation policy is properly implemented then taxation provides various financial needs. For the successful implementation of Taxation policy the co-ordination between the government and community is needed. There is need of deeper and wider study about taxation and its productivity in Nepal. In this regard, this study tries to examine the structure and productivity of taxation which helps researcher, policy makers to carry out their research conclusion or policy a step ahead about taxation and its scope in Nepal. It will also help the common people to know the trend, structure and productivity of taxation during the study period.

1.5 Limitations of the Study

Since the study is based on secondary data, the study does not test and concern on the reliability and validity of the data. The study does not take into account the revenue collected by local government. GDP is used as proxy base while calculating elasticity and buoyancy. That is, only tax to income (GDP) elasticity and buoyancy is calculated.

1.6 Organization of the Study

The study is organized into five main chapters with each chapter further divided into sections and sub-sections. The first chapter deals with the general introduction to the study that contains background of the study, statement of the problem with research questions, objectives of the study, significant of the study, limitations and organization of the study. Chapter two reviews both the theoretical and empirical literature on taxation, buoyancy and elasticity of taxation. Chapter three focuses on the research methodology including specification of the empirical model used for the study. The results of the data collected for the study is analyzed and discussed in fourth chapter. The final chapter presents the summary of findings, recommendations and conclusion of the study.

CHAPTER-II

LITERATURE REVIEW

2.1 Introduction of Taxation

Taxation is used as the main policy instrument for transferring resources to the public sector. It can also assist in creating an atmosphere within which the private sector operates in conformity with national objectives. From the efficiency view point, it can be said that taxes provide the best means of financing the bulk of public expenditure (Shende, 2002). The tax which is compulsory contribution is imposed by a public authority on personnel income and business profits or added to the cost of the some goods, service and transaction, at fixed rate. A tax payer doesn't obtain any direct service in terms of paying tax.

The taxation is divided into two broad categories which are direct tax and indirect tax. The different economists have given different arguments on the basis of types of taxation. Some are favor of direct tax and other some are favor of indirect tax. The direct tax is a tax which is paid by person on whom it is imposed legally. In other words, if the incidence of tax rests upon the person who bears its impact also, then it is called direct tax. Therefore, the direct tax cannot be shifted to others. For example taxation on income, property, gift and so on. It has progressive in nature. Likewise, Indirect is a tax which is imposed on one person but can be paid either partly or wholly by another person. Indirect taxes are mostly subject to shifting. The process of transfer tax is known as shifting. For example: VAT / sales tax, excise duty, import and export duties, tax on rail and bus fares, etc.

The relation between taxation and economic development has long been a matter of concern to policy makers. The primary purpose of taxation is to divert control of economic resources from taxpayers by households and enterprises but influences the allocation economic resources, recognizes social costs that are not reflected in market prices and affects the distribution of income and wealth (Bird and Oldman, 1990).

The two popular concepts are used by researcher and academicians in measuring the responsiveness and the productivity of taxes in a tax system are the concept of 'Elasticity and Buoyancy'. The tax elasticity and the buoyancy of a tax system are commonly known as automatic stabilizers. If a tax system is elastic (i.e. the value of elasticity is more than or equal to one) then the tax system is called stabilized and there is no need of any corrective action by any external authority for the smooth functioning of the tax system (Dahal, 1983).

2.2 Theoretical Review

Different theories have been developed to explain the effect of taxation. Some noticeable theories are discussed in this section.

2.2.1 Benefit Theory

According to this theory, the state should impose taxes on individuals according to the benefit conferred on them. It means that, the more benefits a person derives from the activities of the state, the more he must pay to the government. This theory seeks to ensure that each individual's tax obligations are as far as possible based on the benefits that he or she receives from the enjoyment of public services. The benefit theory of taxation has been widely accepted in the 17th century. The principle of benefit taxation believes in the nation; "do not take more than you give" and moreover, this theory says that the aggregate benefit provided by the government should be compensated by the collective sacrifice done by an individual in the form of tax.

2.2.2 Ability to Pay Theory

This theory was also known as the classical approach of taxation. It was developed due to the inadequacies in benefit and burden or sacrifice theories of taxation. This is the most popular and commonly accepted principle of equity or justice in taxation, that is, citizens of a country should pay taxes to the government in accordance with their ability to pay. Thus this theory is based on the just, fair and equal sacrifice of taxation. According to this theory, the taxes should be levied on the basis of the taxable capacity of an individual. If the taxable capacity of person X is greater than the person Y then the person X should be asked to pay more taxes than the person Y.

2.2.3 Excess Burden Theory

Excess burden implies the burden borne by an individual (consumer) after imposing the tax or in the form of direct or indirect tax. However, majority of the public economists considered that the indirect tax has its excess burden on an individual in comparison to the direct tax. When a tax is imposed, it has its burden on tax payers and also on the society at large. Both money burden and real burden is felt by tax imposition. The associations of such burdens with the tax are felt by the people. However, there may be an additional burden or secondary burden on the tax payers when a tax changes, the price ratio of commodities which he consumes. Thus, when the tax is imposed on one commodity rather than others, the

relative price ratio between the two commodities undergoes a change. In other words, one commodity becomes relatively cheaper than the other in-post tax situation and the tax payers have to substitute the non-tax products for tax products. Such substitution is contrary to his preference pattern between the two products and is imposed on him against his will. This reallocation of consumer's budget lowers down than welfare level and is a secondary burden on him. Such secondary burden is called the excess burden of a tax.

The theory of excess burden has been developed in term of both the 'old welfare economics' and 'new welfare economics'. The old welfare economics was developed by Alfred Marshall who explained the concept of inter-personal utility comparison and the new welfare economics was developed by Hicks-Joseph who excluded the inter-personal utility comparison and shows that the direct tax is superior in comparison to the indirect tax. Thus, the excess burden of taxation was explained with the help of propositions propounded by Marshallian (Cardinal Approach) and Hicks-Joseph Proposition (Ordinal Approach).

2.3. Empirical Review

2.3.1. International Context

Goode (1984) analyzed the three major principles of tax design which was equity, efficiency and administrative feasibility for fairness in the community, cost efficiency of administration and growth, stability and equitable distribution.

Ahmad and Stern (1987) analyzed the Indian tax system and then they found that there was necessary to revise the government policies. The calculation of effectiveness of taxes showed that there was a very considerable taxation of intermediate goods in India. In measuring the responsive of taxes 'elasticity and 'buoyancy' are the two popular concepts widely used by the academics, researchers, policy makers and international fiscal authorities.

AERC (1998) evaluated the revenue productivity of Ghana's overall tax system and of individual taxes on the basis of estimates of tax buoyancies and elasticities. Their study also observed the links between the tax reform of 1983-1993 and revenue performance as well as at ways of mobilizing additional revenue. The study showed that the tax reforms were had significant impact on the productivity of both the individual taxes and the overall tax system. The result of this study was that all the individual taxes except for Cocoa export tax and excise duties buoyancies and elasticities of more than unity during the reform period.

Shapi (1999) analyzed the effect of the tax structure on economic performance in Zambia. He used all types of taxes in Zambia and identified any of their changes in composition established. He has used both secondary and primary data in his study. His findings were analyzed by using percentages, person product-moment correlation coefficient, economic model and diagrams. The results included fifteen types of taxes whose composition varied from 1994 to 1998. He was found that the relative composition of changes in types of taxes has been changing for the period 1994 to 1998 and also the direction of change of the tax structure with changes in the GNP found to be in the same direction. This relation is positively correlated. Tax impact on various income and expenditure flows in the economy. But the business persons cited such major taxes as import duties which impact on sales revenue while income tax on profits was considered positive.

Kelly (1999) found out the five major principles for the policy and administrative structure of individual revenue instruments which are revenue potential, economic efficiency, equity, administrative feasibility and political acceptability. Revenue potential is perhaps the single most important criterion when analyzing and redesigning a revenue instrument.

Sophia and Gambao (2001) analyzed the Ireland's corporation income tax and individual income tax responsiveness towards GDP and interest rate and they found that there is a highly sensitive relationship between income tax to interest rate and GDP by a 2.5 percent to 1 percent ratio with GDP and 0.014 percent to 1 percent with interest rate.

Mansfield (1972) empirically analyzed the two major problems; (a) what was the elasticity of the tax system and its components and how is the size of the elasticity coefficient explained? (b) What was the buoyancy of the system relative to its elasticity? He found that the elasticity coefficient of total tax system was 1.14 in Paraguay and elasticity of different tax heads such as import duties 7.21, income tax 1.08, wealth tax 1.52 and export taxes had a low elasticity of 0.06, whereas the buoyancy coefficient has measured 1.69 which implies that 1 percent change in GDP will bring out 1.14 percent change in total tax and remaining 0.55 percent change in total revenue due to discretionary change.

Mukarran (2001) examined the elasticity and buoyancy of major taxes in Pakistan over the period 1981-2001 by using the chain indexing technique. His study revealed that estimates of elasticity and buoyancy are higher for direct taxes followed by sales taxes. However, customs and excise duties appeared to be relatively rigid, due to which the overall tax elasticity is low. Further, the estimates of buoyancy are higher than their corresponding elasticities for all the

taxes confirming thereof that most of the growth in revenues has been achieved due to enhanced tax rates and broadened tax bases instead of automatic growth. The coefficient of elasticity exceeds unity only for direct taxes and is almost unity for sales taxes. Therefore, the author concluded that the direct taxes and sales taxes are the pillar of the future resource mobilization strategy of Pakistan.

Bilquees (2004) empirically examined the elasticity and buoyancy of the tax system for the period 1974/75 to 2003/04 in Pakistan using Vector Auto-regressive technique. He found that the elasticity of the total tax revenue both with respect to the total GDP and the non-agricultural GDP base is less than unity. And he also found that the low buoyancy of income tax during the study period. And then he concluded that both elasticity and buoyancy are less than unity during the study period in Pakistan.

Upender (2008) attempted to provide an empirical content to differential coefficient of buoyancy during post tax reform period in India by fitting double log regression model with an interaction variable to the stationary time series data based on Augmented-Dickey Fuller and Phillips-Parron tests. The regression results illustrated that the estimate of constant gross tax buoyancy is positively significant and more than unity during pre-tax reform period illumination that gross tax is moderately elastic. But the regression coefficient of interaction variable is significantly negative and stumpy showing a downward shift in the degree of tax buoyancy during post tax reform period. The estimate of tax buoyancy which was just above the unity during the pre-tax reform period and is less than unity during post tax reform period evincing the fact that gross tax is relatively inelastic.

Gituku (2011) set to establish the implication of tax reforms on revenue productivity for the period 1920-2010 in Kenya using elasticity and buoyancy models. Proportional adjustment method has been used in adjusting tax revenue figures in order to estimate elasticity. He found that Kenyan tax system was in general not productive despite several reforms and measures undertaken. He was highlighted by buoyancy and elasticity less than unity for all taxes except for excise duty. VAT and direct taxes were the mostly affected by reforms as the difference between elasticity and buoyancy was above 0.2.

Samuel and Issaac (2012) empirically examined the elasticity and bouyancy of tax components and tax system in Kenya using time series data. They found out that a decreasing proportion of incremental income was transferred to the government in the form of taxes, implying that the tax sytem was less buoyant. It was also found that a decreasing proportion

of incremental income was transferred to the government in the form of tax revenues. Therefore implying that they concluded, the tax system in Kenya was inelastic over the study period.

Eugene and Chineze (2014) examined the productivity of the Nigeria tax system using a time series data of 20 years. The study has used tax elasticity and buoyancy approach to estimate the productivity of taxation in Nigeria. Regression in Minitab statistical software has been used to analyze the data. The study found that a linear relationship between tax policy and tax base and a weak relationship between tax revenue and economic growth.

Asharaf and Sarwar (2016) assessed the role of institution on the tax buoyancy using a panel data set from fifty developing countries. The study employed pool OLS estimator. Their findings were: corruption has distortionary effects on tax while tax buoyancy and elasticity were found to be high in countries having democratic system of governance.

Musa, Bulus, Nwokolo and Yuni (2016) examined the tax elasticity and buoyancy in Nigeria. The study used secondary data which were sourced from CBN statistical Bulletin, NBS, Federal Inland revenue Service (FIRS) of Nigeria. A standard multiple regression estimation procedure in the form of the vector correction model has been employed. The result from the study showed that tax revenue is significantly buoyant and elastic in Nigeria.

2.3.2. National Context

Reejal (1976) analyzed the Nepalese tax structure, in which he found that the Nepalese tax structure is fairly elastic with elasticity and buoyancy of tax system of Nepal is 1.82 and 2.18 respectively for that study period. The study found the elasticity and buoyancy of tax system in Nepal by using proportional Adjustment method of Shahota.

Jha (1982) discussed extensively on the prospects for revenue mobilization and also suggested for mobilizing external resources through various tax and non-tax sources in Nepal by analyzing the data of the period from FY 1956/57 to FY 1981/82.

Dahal (1983) analyzed Nepal's tax structure and obtained elasticity and buoyancy coefficients and measured the burden of taxation for the period FY 1965/66 to FY 1981/82. The elasticity and buoyancy coefficients for the period of FY 1965/66 to FY 1981/82 had been found to be 0.92 and 1.51 respectively.

Gurugharan (1993) obtained that the elasticity coefficient of total revenue is 0.495 for the period from 1974/75 to 1983/84 and 0.587 for the period from 1974/75 to 1988/89 implying a

marginal improvement in revenue elasticity for the same period, buoyancy coefficients are 1.365 and 1.281 respectively.

Agrawal (1998) found that the buoyancy of income tax for the period 1967/68 to 1975/76 was 2.18 and elasticity 2.0, implying that income tax has promising future prospects. But elasticity of the land tax is the lowest (0.12), as the buoyancy coefficients (0.17), while sales (1.74), and excise duties (1.29) are fairly elastic. In terms of buoyancy coefficient excise tax (2.20) secured the 1st position followed by sales tax (2.20) and income tax (2.18).

Adhikari (2001) evaluated the distributional characteristics of Nepalese tax system in relation to ability to pay by utilizing the Nepal Living Standard Survey (NLSS) data of 1995/96 and 2003/04. The concentration and Kakwani indices were used to measure the tax incidence. Indices suggested that direct taxes were consistently progressive. The progressiveness was stronger in NLSS 2003/04 than NLSS 1995/96. The economic burden of indirect taxes was not concentrated on the better off as the author found in direct taxes. The results suggest that indirect taxes were also responsible to increase the income inequality in the country.

Poudel (2002) empirically explained that within the direct tax income tax is the largest source which contributes more than 86 percent in FY 1999/00. It was found that the contribution of income tax to direct tax has increased significantly since its contribution. The study also found that the elasticity and buoyancy coefficient of income tax is 0.16 and 1.36 respectively during the period FY 1975/76 to FY 1999/00.

Neupane (2005) has found that the tax and GDP ratio of Nepal is very nominal by comparing the same ratio of neighboring SAARC and other developing countries. The study argued that the income tax is the main component of direct tax and its contribution to the direct tax is 78.28 percent and 19.02 percent in total tax revenue respectively.

Timsina (2007) analyzed the tax performance of Nepal for the period from 1975 to 2005 by using the time series regression approach. He estimated tax elasticity and buoyancy to analyze tax performance. The study revealed that the tax system in Nepal is inelastic (i.e. less than unity) in the sample years undertaken with buoyancy coefficients more than unity. It indicated that a huge pile of revenue emanated from discretionary changes in the tax policy rather than automatic changes.

Shumshere (2008) analyzed the tax structure and responsiveness of tax yields in Nepal using secondary data for FY 1963/64 to 2001/02 a period of thirty nine years. He found that overall trends of revenue from taxation in Nepal shows that the contribution of tax revenue to

GDP has been increasing from 6.41 percent in 1975/76 to 11.97 percent in 2001/02 with some steady rates. At the same time, share of direct tax to GDP increased from 1.4 percent in 1972/73 to 2.5 percent in 2001/02 but share of indirect tax heightened to 7.7 percent from 3.94 percent during the same period. Then he concluded that there is wide difference between elasticity and buoyancy estimates of almost all taxes suggesting that increase in revenue productivity has come through new tax measures with upward revision of rates having narrow base.

Timilsina (2011) found that the automatic response of tax to income is low by using and compare the data to the period FY 1975/76 to 1994/95. He also found that the buoyancy and elasticity of income tax during the study period was 1.37 and 0.41 respectively. The elasticity coefficient of tax during the study period has not revealed significant differences. Later this study has concluded that only the discretionary measures cannot generate freeware. The study suggested that the improvement in tax administration is very important for enhancing the elasticity of the tax.

Department Customs (2014) attempted to assess the revenue scenario under customs administration system during the period 2008/9 to 2014/15. This study was undertaken for the assessment of the tax that has been collected from the customs points only under several headings during twelve months ranging from the fiscal year 2008/09 to 2014/15. This study was basically based on the secondary data provided by department of customs, and economic survey, ministry of finance. Trend lines and tables were used to show the tax scenario for last six fiscal years. The study concluded that import duty and VAT are major contributors to tax revenue collected from customs administration. VAT contributed to almost 50% share of total taxes and import duty contributed at most 40%. Both import duty and VAT have increasing trends over the fiscal years: however there are constant trends by months throughout the years.

Prasad (2015) analyzed the existing system of excise administration in Nepal and identified ways in which the administrative burden may be reduced for both tax payers and the government. He identified an urgent need to shift from the current physical control system to a self-removal system, as well as a need to rationalize the country's excise legislative provisions, in line with international practices. He also indentified two key issues. First, the physical control system is significantly more costly than the self-removal system in terms of both administration and compliance. Second, the non-officer level excise employees lack

training and education and are unable to effectively monitor and control excise production and sales.

NRB (2016) assessed the buoyancy and elasticity of various revenue heads by using autoregressive distributed lag (ARDL) approach to co-integration developed by Pesaran et al. (1999) for the period 1975-2016. It is found that the long-run buoyancy coefficients are greater than unity for all revenue heads except for custom duty whereas elasticity coefficients except for VAT are smaller than unity. Short-run buoyancy and elasticity coefficients for all revenue heads are found smaller than unity.

2.4 Research Gap

The revenue mobilization in Nepal is still weak because the economy of Nepal has been suffering from various problems like resource constraint, rapid growth of population, higher dependency on agriculture, lack of revenue surplus for government to the development, increasing reliance of foreign loans, aggressive dependence on remittance, domination of indirect taxes to direct taxes and widening resource gap. Hence, in Nepal, the resource gap has been increasing rapidly day by day. But there is a fluctuation in the increasing trend of resource gap indicating that it is necessary to mobilize additional domestic resource and best measure to fulfill the resource gap is to increase public revenue through effective tax system.

There is a gap between this study and the previous studies, most of the previous studies have focused the contribution of various incomes in the government revenue, structure of the government revenue and the income tax from various sources. But this thesis has attempted to find the structure and trend revenue of only major tax heads and also tried to analyze the responsiveness of taxation in Nepal with covering the data of 27 years. This research focused previous analysis and future trend analysis to compute elasticity and buoyancy of major tax heads in Nepal which focused problem and prospects in such field. Including of the time period and that gap with other research is also one of the research gaps for this study.

Chapter-III

RESEARCH METHODOLOGY

Research methodology describes the methods and process applied in the entire study. This chapter explains the detailed methodology of the study. This chapter deals with the research design, nature and sources of data, population and sample and methods of analysis of data.

3.1. Research Design

This research study attempts to analyze the tax structure of Nepal from 1990 to 2016 with the computation of elasticity and buoyancy of different tax heads and also describes its burden. Although there are many types of research design, to explore these issues, analytical as well as descriptive research design is used. The analysis is based on the time series data of 27 years, so time series regression approach for the empirical measurement of the elasticity and buoyancy for different types of taxes are used.

3.2. Nature and Sources of Data

The nature of this study is analytical as well as descriptive. This study is based on secondary data. The secondary sources of data are the books, newspaper, journal articles, related websites, brochures referred as per the need of the study. The main sources of the secondary data are budget speeches and economic survey, Ministry of finance, CBS, Tribhuvan University and records of taxation, dissertations related to taxation available at centre library of T.U.

3.3. Tools and Techniques of Data Collection

Various econometric as well as statistical tools are used to analysis the data of the study. Different graphs, tables and figures are used to analysis the structure and trend of taxation in Nepal. Similarly, econometric tools such as t-test, F-test, D-W test, OLS method are used to analysis the data and to measure the productivity of taxation in Nepal.

3.4 Model Specification

This study has applied time series regression approach for the empirical measurement of the elasticity as well as buoyancy for the different types of taxes. To examine the productivity of taxation: elasticity and buoyancy the following log linear model is used. Single regression equation with independent variable GDP is used to estimate both buoyancy and elasticity coefficients of various revenue series. Moreover, regression equations are transformed to

double log linear to have the estimate of elasticity and buoyancy of various specified relation.

General model to examine the elasticity and buoyancy of taxation is given below:

$$\log Tr_t = \log \alpha + \beta \log Y_t + u_t \dots \dots \dots (1)$$

Where,

Tr_t = tax revenue at time t (adjusted in case of elasticity and actual in case of buoyancy)

α = intercept

β = elasticity or buoyancy coefficient of respective tax

Y_t = Nominal GPD at time t.

u_t = Error term.

Moreover the following equations are used to find the elasticity and buoyancy coefficient for the many different types of taxation in Nepal.

i) Model for buoyancy coefficient during the whole period

$$\ln TR_t = \ln \alpha + \beta_1 \ln Y_t + \varepsilon_t \quad (1.1)$$

$$\ln TTR_t = \ln \alpha + \beta_1 \ln Y_t + \varepsilon_t \quad (1.2)$$

$$\ln NTR_t = \ln \alpha + \beta_1 \ln Y_t + \varepsilon_t \quad (1.3)$$

$$\ln DTR_t = \ln \alpha + \beta_1 \ln Y_t + \varepsilon_t \quad (1.4)$$

$$\ln IDTR_t = \ln \alpha + \beta_1 \ln Y_t + \varepsilon_t \quad (1.5)$$

ii) Model for elasticity coefficient during the whole period

$$\ln TR_{a_t} = \ln \alpha + \beta \ln Y_t + \varepsilon_t \quad (2.1)$$

$$\ln TTR_{a_t} = \ln \alpha + \beta \ln Y_t + \varepsilon_t \quad (2.2)$$

$$\ln NTR_{a_t} = \ln \alpha + \beta \ln Y_t + \varepsilon_t \quad (2.3)$$

$$\ln DTR_{a_t} = \ln \alpha + \beta \ln Y_t + \varepsilon_t \quad (2.4)$$

$$\ln IDTR_{a_t} = \ln \alpha + \beta \ln Y_t + \varepsilon_t \quad (2.5)$$

Note: "a" refers to the adjusted revenue series

Where,

β_1 = Buoyancy coefficient for whole sample periods,

β = Elasticity coefficient for whole sample periods,

α = Intercept parameter,

ε = Stochastic disturbance term,

ln = Natural log,

TR = Total revenue (at current price),

TTR= Total tax revenue (at current price),

NTR = Non-tax revenue (at current price),

DT = Direct tax (at current price),

IDT = Indirect tax (at current price),

3.5 The Adjustment Procedure and Calculation of Elasticity and Buoyancy

Tax revenue usually changes due to discretionary measures, for example, changes in tax rates, tax net expansion and so on. Therefore, a need to separate the changes in revenue emanation through the discretionary measures from that due to automatic measures arises to estimate the elasticity. This is the way to distinguish tax elasticity from tax buoyancy (Timsina, 2006).

Tax revenue series can be adjusted in three ways, namely constant rate procedure, the proportional adjustment procedure and dummy variable procedure. The selection of the appropriate adjustment method depends upon the availability of the data on tax changes and the type and frequency of such changes. There are three methods are available in proportional adjustment method which are Prest method, Sahota method and Chand and Chelliah method. Even though there are three methods under proportional adjustment method, the study is employed Sahota method. The proportional adjustment method (Sahota, 1961) is as follows:

$$IT_t = \frac{(AT_t \pm RT_t)}{AT_{t-1}} IT_{t-1}$$

Where,

IT_t = Adjusted or net tax yield at time t

IT_{t-1} = Adjusted or net tax yield of previous year (t-1)

AT_t = Actual tax yield at time t

AT_{t-1} = Actual tax yield at time (t-1)

RT_t = Actual discretionary change at time t

3.6 Variables Specification

The study attempts to measure the productivity of taxation in Nepal by using the econometric tools as well as different statistical tools in which the following variables are used.

3.6.1 Dependent Variable

Dependent variable is a variable that depends on others variables. It means that a variable affected or changed by effect of others variables is called dependent variable. In this study, the following variables are used as Dependent variables in different regression equation.

- a) **Total Revenue (TR):** The sum of all tax and non-tax revenue is defined as total revenue. Here, total revenue has been divided into two components; Total Tax Revenue and Non Tax Revenue.
- b) **Tax Revenue (TTR):** The sum of revenue received through different tax head is known as total tax revenue. Under this section tax has also been divided into two parts: Direct Tax and Indirect Tax.
- c) **Non-Tax revenue (NTR):** It is the recurring income earned by the government from sources other than taxes. Fines, penalties, fees are some of the examples of non-tax revenue.
- d) **Direct Tax (DT):** The tax which impact and incidence lies on the same person and thus cannot be shifted to other is known as direct tax. In this section, three different categories of tax heads; Income Tax, Land Revenue and Registration Tax are taken.
- e) **Indirect Tax (IDT):** The tax which impact is on one person and the incidence on other is known as indirect tax. Here, the tax amount can be shifted to other partially or wholly. Indirect tax includes; Custom Duties, Import Duties, Export Duties, Excise duties and Sales Tax/VAT. Under VAT or Sales Tax; the Hotel Tax, Entertainment Tax, Air flight Tax and Contract Tax are taken.

3.6.2 Explanatory variables

Explanatory variable is a variable which stands alone. It means that variable is not affected by others is called explanatory or independent variable. In this study GDP in Nepal is considered as Explanatory variables in different equations.

3.7 Tools of Analysis

3.7.1 Adjusted Coefficient of Determination (\bar{R}^2)

It is a static measure that is used to get additional information about the goodness fit of the estimated regression model. Because of the adding of additional explanatory variables in the model or function leads to rise in the value of coefficient. It is obtained by using the following formula.

$$\bar{R}^2 = 1 - \frac{\frac{\text{Unexplained Variation}}{d.f.}}{\frac{\text{Total Variation}}{d.f.}}$$

Where,

\bar{R}^2 = adjusted coefficient of determination

d. f. = degree of freedom

3.7.2 t-Test

The t-test based on student distribution is used to test the hypothesis about any individual partial regression coefficient. It is also used to identify the statistical significance of the individual parameters at the given level of statistical significance. The t-statistic that is computed as the ratio of an estimated coefficient to its standard error is used to test the hypothesis that a coefficient is equal to zero.

To compute t-test statistic, the following formula is used.

$$t = \frac{a}{SE(a)}$$

Where,

$$SE(a) = \sqrt{\frac{\frac{\sum e^2}{N-K}}{\sum (X-\bar{X})^2}}$$

After calculating the value of t-test statistic then it is compared with the tabulated value of t-test statistic with N-K degree of freedom. If the calculated value of 't' is greater than the tabulated value of it then there can be concluded that it is statistically significant at the specified degree of freedom and vice versa.

3.7.3 F-Test

The t-test is very handy when we have two groups to compare. But when happens if we have more than two groups F-test or ANOVA is the statistical technique that is analogous to the t-test.

The ANOVA is an inferential statistic, a parametric statistic and is very powerful. It can reject the null or find differences among groups- if indeed they exist. The assumption of homogeneity of variance, equal group sizes and normal distribution of scores should be adhered to just as the t-test should meet these assumptions.

The statistical technique answers the null hypothesis: there is no difference among three of more than groups on their respective mean scores. There is one independent variable with three or more than three categories. These levels are nominally scaled. There is one dependent variable that is continuous in its numeric range. This means that interval or ratio scales (where units are exactly the same) are used.

The test is also known as the test of the overall significance of the regression. So, it is the test on several parameters of a time. The F-statistic tests the hypothesis that all of the slope coefficients (excluding the constant or intercept) in a regression are zero. For OLS models, the F-statistic is computed as

$$F = \frac{\frac{R^2}{K-1}}{\frac{(1-R^2)}{N-K}}$$

After calculating F-test statistic then its value is compared with the tabulated or theoretical value at specific level of significance with K-1, N-K degree of freedom. If the calculated value of F-test is higher than the tabulated value at specific level of significance then it is reject the null hypothesis and vice versa. It means that there is the significance relationship between dependent and explanatory variable and vice versa.

3.7.4 Darwin-Watson test

The most often used test for first-order autocorrelation is the Durbin-Watson d test. It is important to note that this test can only be used to test for first-order autocorrelation; it cannot be used to test for higher-order autocorrelation. Also, this test cannot be used if the lagged value of the dependent variable is included as a right-hand side variable.

For this test there are null and alternative hypotheses are set as follows:

$H_0 : \rho=0$ (there is no autocorrelation)

$H_1: \rho \neq 0$ (there is autocorrelation)

To test the hypothesis Durbin-Watson statistics is used below:

$$d = \frac{\sum_{t=2}^n (e_t - e_{t-1})^2}{\sum_{t=2}^n e_t^2}$$
 which is simply the ratio of the sum of squared differences in

successive residuals to the RSS. Note that in the numerator of the d statistic the number of observations is n-1 because one observation is lost in taking successive differences.

When $\hat{\rho} = 0$, $d=2$ this indicate that there is no autocorrelation. If $\hat{\rho} = 1$, $d=0$ this indicate that there is perfect positive autocorrelation. If $\hat{\rho} = -1$, $d=4$ this indicate that there is perfect negative autocorrelation.

Thus d statistics lies between 0 to 4 in response to positive to negative value of p. the value of d statistics obtain from above formula are compare with theoretical value for decision making. With the help of d- statistics, if the value of d lies near to the zero there is positive autocorrelation, if it lies near to 2 there is no auto correlation and values lies near to 4 there is negative autocorrelation.

3.8 Pre-Estimation Test

a. Stationary Test

The data sets must be stationary to be valid that is the mean and the variance of the data set is time independent and they are constant over time. The study has used the order of integration to test the stationary of the data. If a series is integrated of order (0) then it is stationary but if otherwise it is non-stationary and to test stationary, the study employed the Augmented Dickey Fuller Unit Root Test. (Gujarati, 1995).

b. Augmented Dickey Fuller Unit Root Test

The study has employed the augmented dickey fuller test. The test can be used to test the order of integration for a variable generated with a drift from and a deterministic trend. This is because the errors may not be normally and identically distributed and the residual variance may be biased. The null hypothesis may be taken to mean taxations follow a random walk and future taxation cannot be predicted while the alternative may mean economic agents may predict future taxes and do not follow a random walk.

CHAPTER IV

DATA INTERPRETATION AND ANALYSIS

This chapter is divided into two sections. The first section provides the necessary information about the first objectives of this study. It means that the first section of this chapter deals about the trend, pattern and structure of the taxation in Nepal during the study period. Similarly, the second section provides the key information about the second objective in which this section deals about the responsiveness of taxation in Nepal by obtaining the elasticity and buoyancy of taxation.

4.1 Structure of Taxation in Nepal

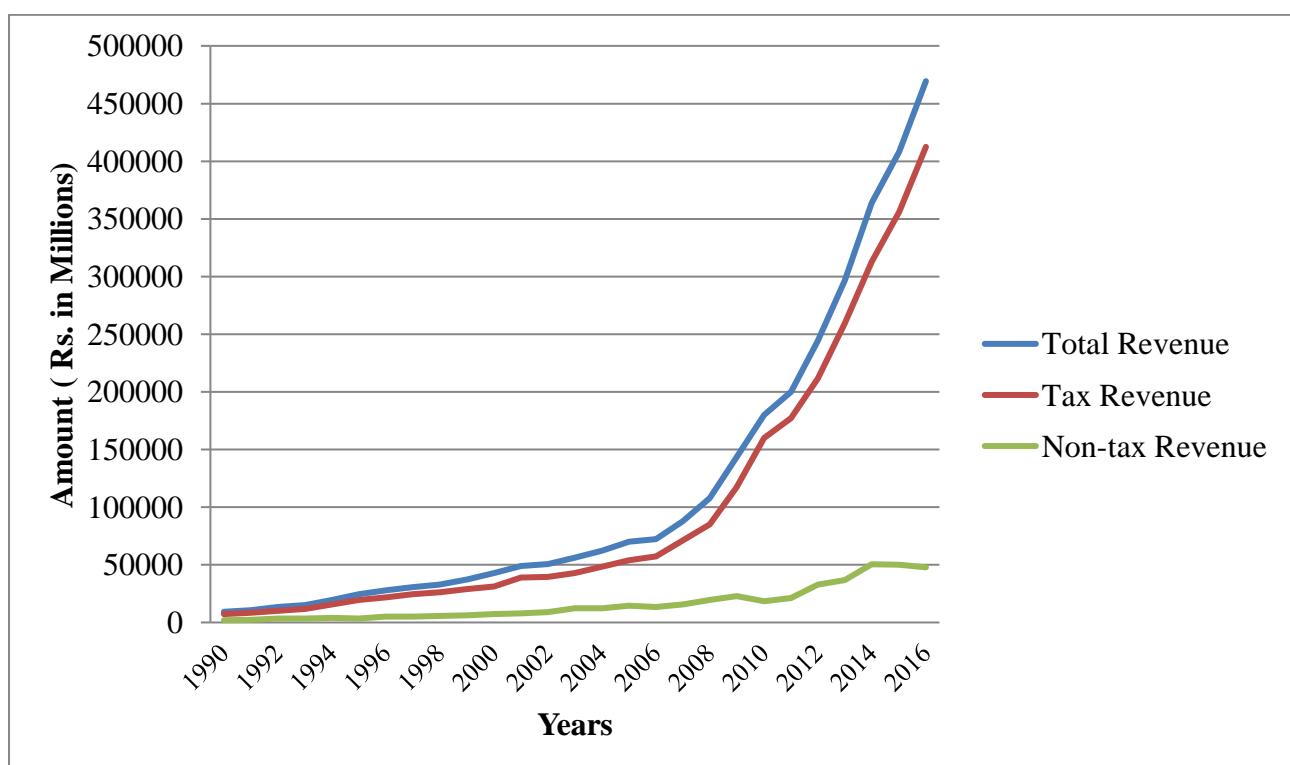
The government of any states has responsibility of increasing the social welfare in a nation for the betterment of the people. Due to this, the government needs huge amount of fund to fulfill the various types of expenditure in the developing countries like Nepal. There is no doubt to say that there is vital role of the taxation for increasing expenditure of the government.

In the context of Nepal, the tax structure refers to the level as well as relative importance of various taxes in the composition of total tax revenue of a country. A discussion of tax structure deals with the balance between direct and indirect taxes (Dhungana et. al. 1976). Generally, the government collecting revenue is classified into two categories, namely tax revenue and non-tax revenue. Under tax revenue, there are two types of tax such as direct tax and indirect tax. The income tax, capital gain tax, House land registration and Vehicle tax are included in direct taxes. Similarly, the custom duties, excise duties and Value added tax (VAT) are included in indirect tax. So, the composition of direct tax and indirect tax is different. The summation of direct tax and indirect tax is known as the total tax revenue of Nepal. So, to observe the structure of taxation in Nepal, it is needed to analyze the total revenue structure with tax revenue and non-tax revenue and separation of total tax revenue into direct tax and indirect tax and it is also needed to observe the tax GDP during the study period.

4.1.1 Structure of Total Revenue with Tax and Non-Tax Revenue

Tax revenue plus non-tax revenue is known as total revenue in Nepal. Both sources of the revenue are advantageous to the government because there is no obligation of repayment. So, it is more desirable in comparison to that sources which has an obligation of repayment such as loans and grants. The trend, structure and pattern of total revenue with tax and not-tax revenue during the study period are presented in figure 4.1, table 4.1 below.

Figure 4.1 Structure of Total Revenue with Tax Revenue and Non-Tax Revenue



Source: Calculation using Excel based on Appendix I

In the figure 4.1 shows that the trend and structure of total revenue, tax revenue and non-tax revenue respectively. It can be said that there is gradually increasing trend of tax revenue collection during the study period. The contribution of non-tax revenue to the total revenue can be observed low fluctuating during the study period. The upper trend line in the figure is total revenue line which is ascending upward. Near this line, there is next line is known as tax revenue. From this, it can be that the contribution of tax revenue to the total revenue is large in competition to the non-tax revenue. Because, the lower trend line in the figure is non-tax revenue trend line which is very low. The figure 4.1 shows that the trend of increasing of non-tax revenue is very slow in comparison to the tax revenue during the study period.

The increasing trend of total revenue, tax revenue and non-tax revenue can be observed very slow before 1995s. After 1995s, the trend of these revenues have gradually increasing trend. It might be the cause of adaptation of liberalized and privatized policy in the economy which was helpful to increase the business activities in the economy with involvement of private sector. It can be observed that in the figure 4.1, the total revenue, tax revenue and non-tax revenue was increased moderately after 1995 to before 2005 and then after FY 2006/07 both total revenue and tax revenue have increased at faster increasing trend. It might be the cause of change of political movement in 2006/07. After the political movement in FY 2006/07, the system of government has been changed. The new government has launched the new tax bases and rates. So, it is seen the contribution of tax revenue to the total revenue has hugely increased in comparison to the contribution of non-tax revenue. There can be seen fluctuating trend of non-tax revenue after FY 2006/07. It may be due to the weak administration with political movement in FY 2006/07.

Similarly, the trends and structure of total revenue with tax revenue and not-tax revenue from the period of 1990 to 2016 is presented in a table 4.1 below:

Table: 4.1. Trends and Composition of Total Revenue with Tax and Non-Tax Revenue**(Rs. In Millions)**

Years	Total Revenue	Tax Revenue	Percentage of Tax Revenue	Non-tax Revenue	Percentage of Non-tax Revenue
1990	9287.9	7284.1	78.43	2003.8	21.57
1991	10730.4	8176.6	76.20	2553.8	23.80
1992	13512.7	9875.6	73.08	3639.9	26.94
1993	15148.4	11662.6	76.99	3485.8	22.83
1994	19580.7	15371.5	78.50	4209.2	21.50
1995	24575.2	19660	80.00	3704.5	15.07
1996	27893.1	21668	77.68	5131.2	18.40
1997	30373.4	24424.1	80.41	5086.2	16.75
1998	32937.9	25926.6	78.71	5749.9	17.46
1999	37251	28753	77.19	6256.4	16.80
2000	42889.6	31148.3	72.62	7558.4	17.62
2001	48893.6	38865	79.49	7971.5	16.30
2002	50445.6	39332.2	77.97	9226.1	18.29
2003	56229.7	42587	75.74	12103	21.52
2004	62331	48175.7	77.29	12304.8	19.74
2005	70124.1	54106.1	77.16	14770.3	21.06
2006	72282.1	57427	79.45	13341.3	18.46
2007	87712.1	71168	81.14	15518.5	17.69
2008	107622.7	85147	79.12	19794.7	18.39
2009	143474.4	117051.8	81.58	22892.2	15.96
2010	179945.8	159785.4	88.80	18206.5	10.12
2011	199819	177227.2	88.69	21149.2	10.58
2012	244561.1	211722.6	86.57	32651.5	13.35
2013	296776.5	259214.9	87.34	36806.2	12.40
2014	363493.4	312439.9	85.95	50483.7	13.89
2015	407947.7	355935.5	87.25	49910.7	12.23
2016	469425.5	412424.4	87.86	48001.1	10.23

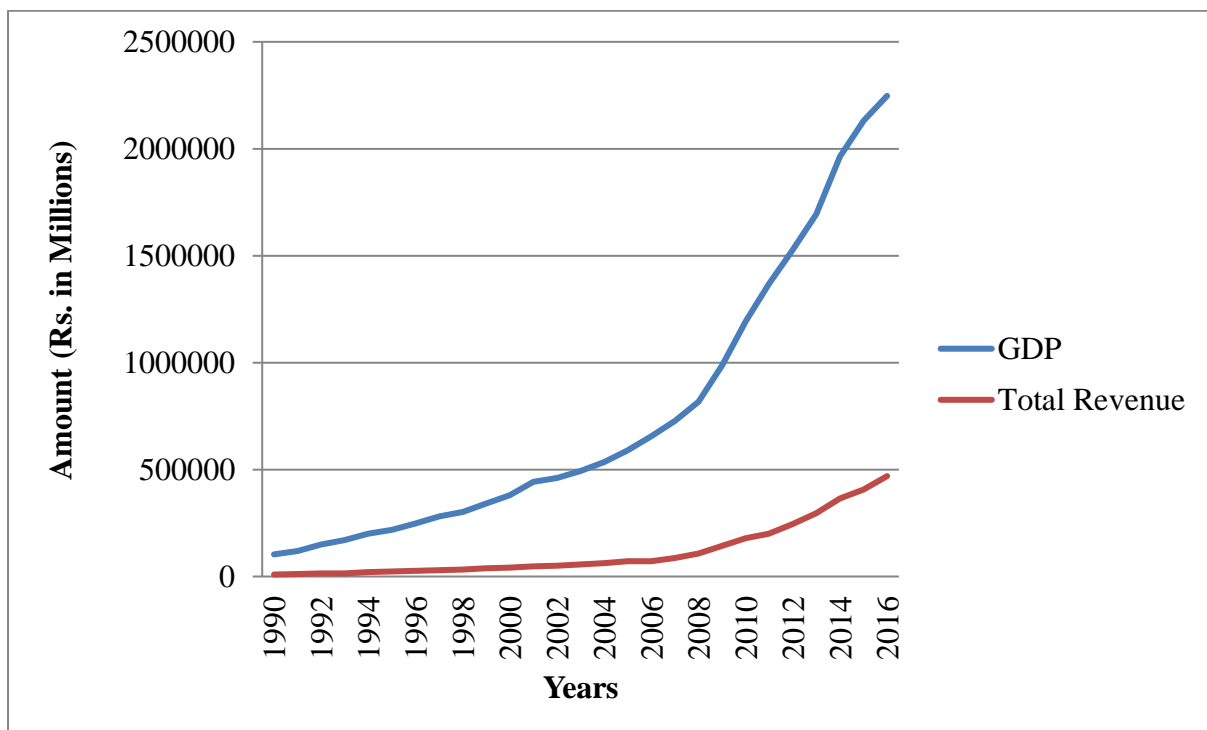
Source:- A Handbook of Government Finance Statistics, NRB and Economic Survey, 2016 based on Appendix I

In the table 4.1 shows that the share of tax revenue has always been greater than the share of non-tax revenue. In 2016, the share of tax revenue and non-tax is 87.86 percent and 10.23 percent respectively as compared with 83.57 percent and 16.43 percent in 1975. It indicates that the tax revenue has been placed as major source of government revenue in Nepal. The table also shows that the composition of tax revenue and non-tax revenue in total revenue. The contribution of tax revenue to the total revenue increased marginally from 78.43 percent to 87.86 percent during the study period 1990 to 2016 whereas the share of non-tax revenue has declined marginally from 21.57 percent to 10.23 percent in the same period. But the trend of increasing and decreasing of tax revenue and non-tax is not continuous. It is in erratic in nature.

4.1.2 Structure of Total Revenue along with GDP

The share of revenue to the GDP is large in comparison to the grants and loans. The level of GDP determines the level of total revenue because there is the direct impact GDP on tax revenue. Increasing GDP leads to increase in total tax revenue. The structure of total revenue along with GDP is shown in the given figure 4.2 below.

Figure: 4.2 Structure of Total Revenue along with GDP



Source: Calculation using Excel based on Appendix I

In figure 4.2 the upper trend line is the GDP trend line which shows the increasing trend from the period of 1990 to 2016. Similarly, the lower trend line in the figure is total revenue trend line which is also in increasing trend but not as much as GDP line. It is due to the total revenue is only a part of GDP. The share of total revenue to the GDP is presented in the following table 4.2.

Table: 4.2 Structure of Total revenue along with GDP

(Rs. in Millions)

Years	GDP	Total Revenue	Percentage of GDP
1990	103416	9287.9	8.98
1991	120370	10730.4	8.91
1992	149487	13512.7	9.04
1993	171492	15148.4	8.83
1994	199272	19580.7	9.83
1995	219175	24575.2	11.21
1996	248913	27893.1	11.21
1997	280513	30373.4	10.83
1998	300845	32937.9	10.95
1999	342036	37251	10.89
2000	379488	42889.6	11.30
2001	441519	48893.6	11.07
2002	459443	50445.6	10.98
2003	492231	56229.7	11.42
2004	536749	62331	11.61
2005	589412	70124.1	11.90
2006	654084	72282.1	11.05
2007	727827	87712.1	12.05
2008	815658	107622.7	13.19
2009	988272	143474.4	14.52
2010	1192774	179945.8	15.09
2011	1366954	199819	14.62
2012	1527344	244561.1	16.01
2013	1695011	296776.5	17.51
2014	1964540	363493.4	18.50
2015	2130150	407947.7	19.15
2016	2247427	469425.5	20.89

Source: Calculation using Excel based on Appendix I

It can be said that the share total revenue to GDP is gradually increased from 8.98 percent in 1990 to 20.89 percent in 2016. The average GDP is obtained at Rs. 753496.37 million during the study period 1990 to 2016 whereas the average total revenue is observed at Rs. 115750.54 million in the same study period 1990-2016. The average share of total revenue to the GDP is remained at 12.65 percent during the study period.

4.1.3 Tax-to-GDP Ratio

To compare the amount of tax collected by a government to the amount of income that received by a government tax-to-GDP ratio is used. So, tax-to-GDP is called economic measurement which is used to access a country's development. It is calculated by dividing the total tax revenue by GDP of the country. Therefore, it is the ratio of tax collection against the GDP of the country. If the tax revenues increase at a slower rate than the increase GDP of the country the tax-to-GDP ratio drops and vice-versa.

Tax-to-GDP ratio is shown in the given table 4.3 in which the tax-to-GDP ratio of Nepal is ranges between 7.04 percent and 18.35 percent during the study period 1990 to 2016. The lowest tax-to-GDP ratio is recorded in 1992 at 6.61 percent and the highest tax-to-GDP ratio is recorded at 18.35 percent in 2016. It indicates that increase in both GDP and tax revenue increases the tax-to-GDP ratio and vice versa. In the recent years, there is a high tax-to-GDP ratio which is the good indication for the tax system. The tax-to-GDP ratio is growing non-linearly with the rise in both tax revenue and GDP during the study period.

The marginal tax rate shows the ratio of change in tax revenue to change in GDP of the country. In the table 4.3, marginal tax rate shows fluctuating change in tax revenue as well as GDP during the study period. It can be observed that there is wide variation in marginal tax rate i.e. 21.51 percent in 2012 to 2.61 percent in 2002. It means that the tax rate did not increase sufficiently as GDP increased in 2002.

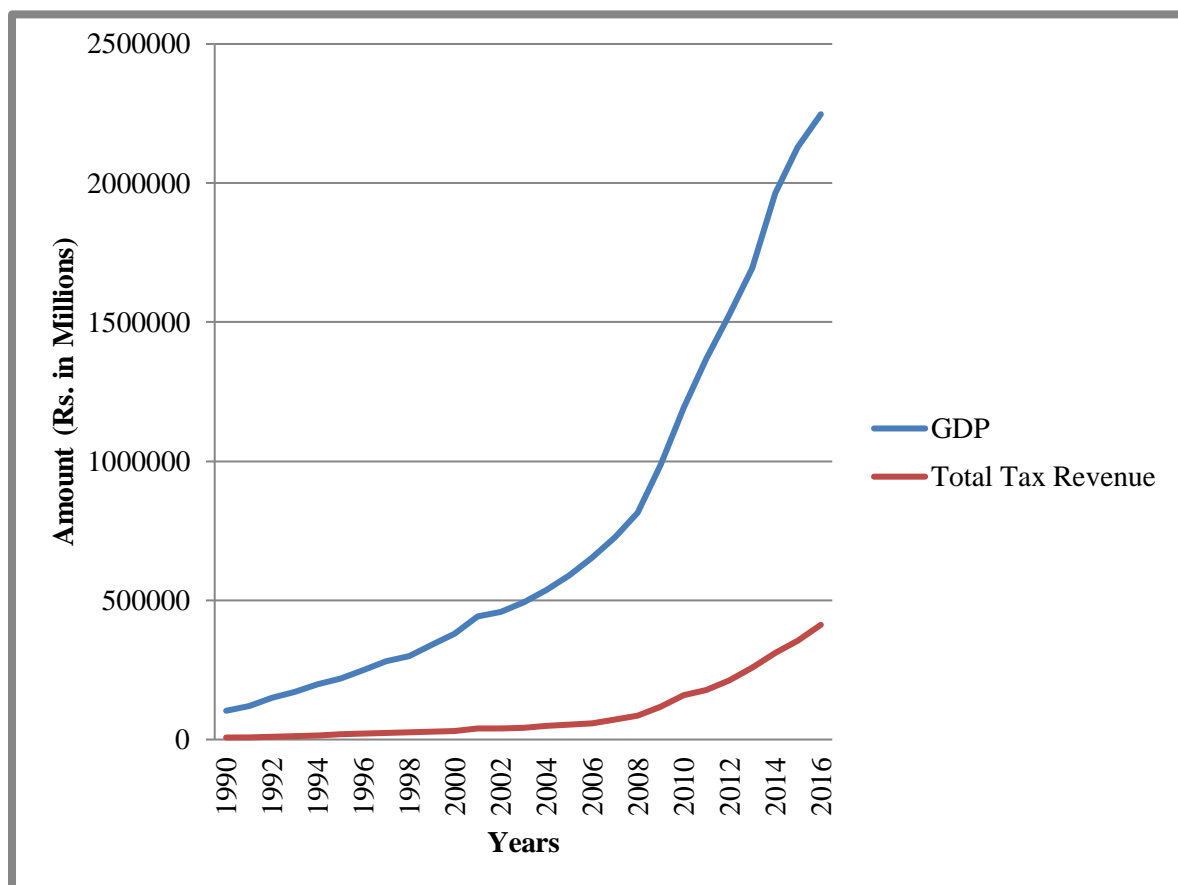
Table: 4.3 Tax-to-GDP Ratios**(Rs. in Millions)**

Years	GDP	TTR	Change in GDP	Change in TTR	ATR (%)	MTR (%)
1990	103416	7284.1			7.04	
1991	120370	8176.6	16954	892.5	6.79	5.26
1992	149487	9875.6	29117	1699	6.61	5.84
1993	171492	11662.6	22005	1787	6.80	8.12
1994	199272	15371.5	27780	3708.9	7.71	13.35
1995	219175	19660	19903	4288.5	8.97	21.55
1996	248913	21668	29738	2008	8.71	6.75
1997	280513	24424.1	31600	2756.1	8.71	8.72
1998	300845	25926.6	20332	1502.5	8.62	7.39
1999	342036	28753	41191	2826.4	8.41	6.86
2000	379488	31148.3	37452	2395.3	8.21	6.40
2001	441519	38865	62031	7716.7	8.80	12.44
2002	459443	39332.2	17924	467.2	8.56	2.61
2003	492231	42587	32788	3254.8	8.65	9.93
2004	536749	48175.7	44518	5588.7	8.98	12.55
2005	589412	54106.1	52663	5930.4	9.18	11.26
2006	654084	57427	64672	3320.9	8.78	5.13
2007	727827	71168	73743	13741	9.78	18.63
2008	815658	85147	87831	13979	10.44	15.92
2009	988272	117051.8	172614	31904.8	11.84	18.48
2010	1192774	159785.4	204502	42733.6	13.40	20.90
2011	1366954	177227.2	174180	17441.8	12.97	10.01
2012	1527344	211722.6	160390	34495.4	13.86	21.51
2013	1695011	259214.9	167667	47492.3	15.29	28.33
2014	1964540	312439.9	269529	53225	15.90	19.75
2015	2130150	355935.5	165610	43495.6	16.71	26.26
2016	2247427	412424.4	117277	56488.9	18.35	48.17

Source: Calculation using Excel based on Appendix I

Increasing tax-to-GDP ratio is important for developing countries like Nepal. Higher tax-to-GDP ratio helps to reduce the fiscal deficit of the country. The tax-to-GDP ratio can sometimes be considered as the simplest measure of tax burden or sacrifice of the tax-payer in national sense.

Figure: 4.3 Growth Trends of GDP and Total Tax Revenue



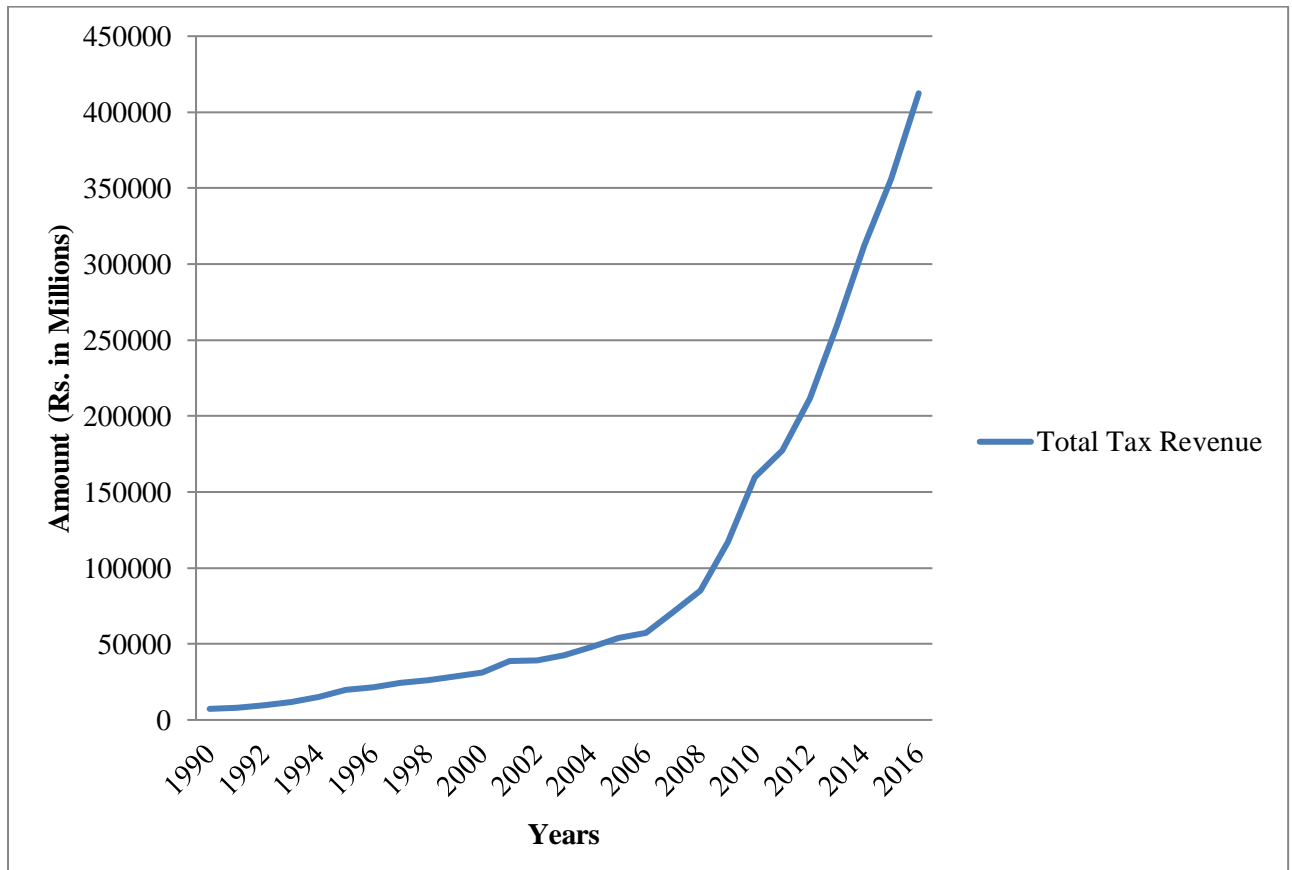
Source: Calculation using Excel based on Appendix I

In figure 4.3 is presented the growth trend of GDP and tax revenue. It can be observed that the tax revenue has been growing very slowly with comparison to the trend of GDP. The trend of increasing both GDP and total tax revenue is likely same before 1994. Then the trend of growing of GDP is moderately different from total tax revenue growing trend until 1998. After then, The GDP has been increasing with an increasing pace but the tax revenue has not increased with the same pace as that of GDP.

4.1.4 Structure of Total Tax Revenue

Tax revenue is the major part of the government revenue. It is taken as the large share of government revenue. So it is necessary to know the structure of total tax revenue to make tax reforms and to enlarge the tax base and tax rates. Here, the structure of total tax revenue is shown in figure 4.4 below.

Figure: 4.4 Structure of Total Tax Revenue



Source: Calculation using Excel based on Appendix I

In the Figure 4.4 shows that the trend and pattern of total tax revenue in Nepal ranging from 1990 to 2016. The figure 4.4 shows that the tax revenue was started at Rs. 7284.1 million in 1990 and increased to Rs. 412424.4 millions in 2016. The average tax revenue is observed at Rs. 98020.74 million during the study periods. The increasing trend of tax revenue was observed very slow before 2000. After 2000 to before 2006, there is moderate trend of growing of tax revenue and then after 2006, the trend of tax revenue is gradually in increasing pace which is the good indication for good tax system. It is seen that the faster growing trend of tax revenue after 2006. It may be the cause of change in political movement, change in tax base and tax rates with tax reform policy of the government.

4.1.5 Total Tax Revenue along with Direct Tax and Indirect Tax

Total tax revenue has two different categories, viz. direct tax and indirect tax revenue. So, the total tax revenue is the composition of direct tax and indirect tax revenues. The tax revenue on customs, consumption and production is known as indirect tax whereas direct tax is composed on income and capital. The following table 4.4 shows the composition of total tax revenue and the share of direct and indirect tax in total revenue.

Table: 4.4 Composition of Total Tax Revenue

(Rs. in Millions)

Years	TTR	DT	% of DT	IDT	% of IDT
1990	7284.1	1369.8	18.81	5914.3	81.19
1991	8176.6	1285	15.72	6891.6	84.28
1992	9875.6	1487.3	15.06	8388.5	84.94
1993	11662.6	1879.7	16.12	9782.9	83.88
1994	15371.5	2657.4	17.29	12714.1	82.71
1995	19660	3797	19.31	15863	80.69
1996	21668	4585.2	21.16	17082.8	78.84
1997	24424.1	5233.6	21.43	19190.5	78.57
1998	25926.6	6015.3	23.20	19911.3	76.80
1999	28753	7296.8	25.38	21456.2	74.62
2000	31148.3	8551	27.45	24597.3	78.97
2001	38865	9769.7	25.14	29095.3	74.86
2002	39332.2	10039.3	25.52	29292.9	74.48
2003	42587	10103.8	23.73	32481.2	76.27
2004	48175.7	11901.9	24.71	36273.8	75.29
2005	54106.1	13061.3	24.14	41044.8	75.86
2006	57427	13961.5	24.31	43465.5	75.69
2007	71168	18979.7	26.67	52188.3	73.33
2008	85147	23070.8	27.10	62076.3	72.90
2009	117051.8	34552.6	29.52	82499.2	70.48
2010	159785.4	41760.5	26.14	114530.2	71.68
2011	177227.2	48640.9	27.45	124114.3	70.03
2012	211722.6	66906.7	31.60	144811.6	68.40
2013	259214.9	81937.5	31.61	177206.1	68.36
2014	312439.9	97065.5	31.07	211713.2	67.76
2015	355935.5	113991.2	32.03	241951.8	67.98
2016	412424.4	149494.4	36.25	271553.9	65.84

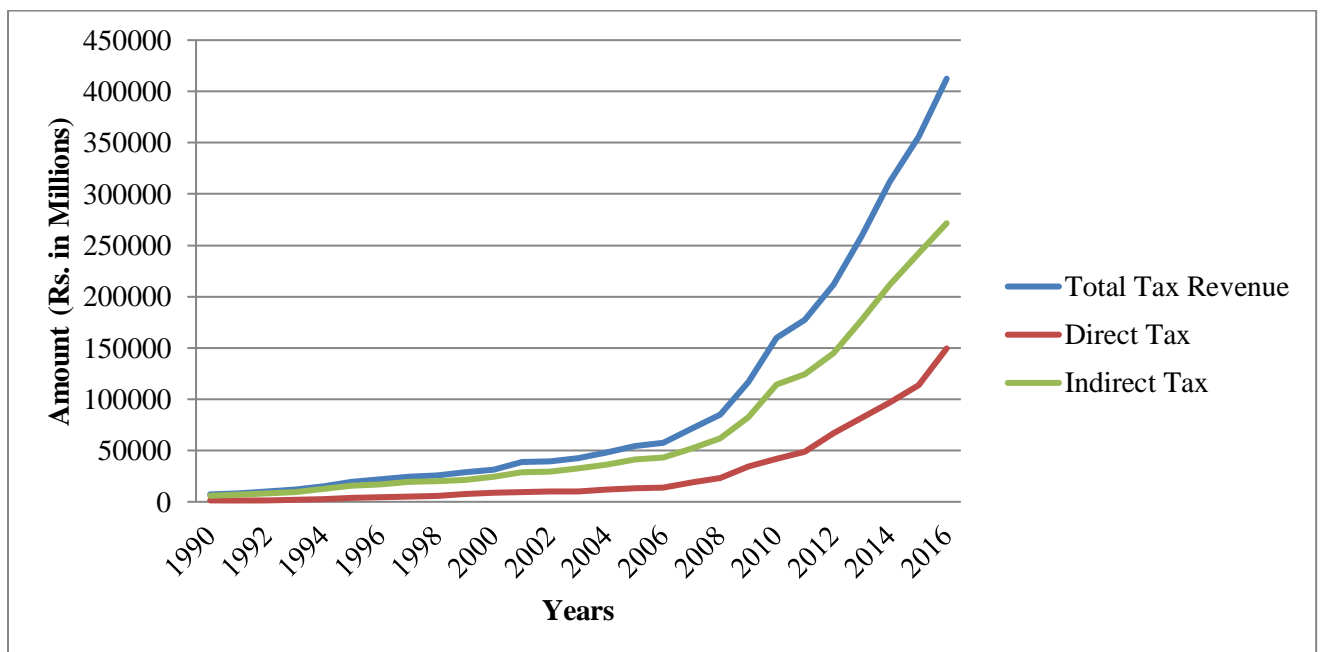
Source: Calculation using Excel based on Appendix I

In the table 4.4 shows the contribution of direct tax and indirect tax to total revenue during the study period. It is observed that the share of indirect tax is significantly higher than the share of direct tax to the total revenue. But the volume of both taxes seems to be increasing

simultaneously throughout the periods. The share of direct tax to the total tax has ranged from 18.18 percent to 36.25 percent during the study period. Likewise the share of indirect tax to the total tax has ranged from 81.19 percent to 65.84 percent in the same period. It is seen that the share of direct tax is in growing pace while the share of indirect tax is in declining pace during the study period. But the trend of increasing and decreasing is not linear. The lowest share of direct tax is recorded at 15.06 percent in 1992 and a highest percent is recorded at 36.25 percent in 2016. Similarly, the lower percentage share of indirect tax is recorded at 65.84 percentages in 2016 while a highest percentage share of indirect tax is measured at 84.94 percent in 1992.

The average share of direct taxes is obtained at 24.74 percent during the study period while the average share of indirect taxes is obtained at 75.36 percent in the same study period. So, it can be concluded that the share of direct tax to the total tax revenue is far lesser than that of indirect taxes. It signifies that Nepal still have to do so much in revenue collection sector. The structure of total tax revenue along with direct tax and indirect tax revenue can be presented in the figure as shown below:

Figure: 4.5 Structure of Total Tax Revenue along with Direct Tax and Indirect Tax



Source:- Calculation using Excel based on Appendix I

In the figure 4.5 shows the trend, structure and pattern of total tax revenue along with direct tax and indirect tax. The upper trend line shows the structure and pattern of total tax revenue. Like that, the middle trend line shows the structure and pattern of indirect tax and the lower

trend line shows the structure and pattern of direct tax in Nepal during the study period. It can be said that the Nepalese tax structure is dominated by indirect tax revenue in comparison to the direct tax. Indirect tax has a dominant role in tax structure in Nepal which is not good symptom of economic development because indirect tax is the cause of decreasing social welfare. The contribution of both taxation on total tax revenue was likely same before 1994. But after 1994s, the share of indirect tax is always one step front than direct tax.

4.2 Econometric Analysis of Elasticity and Buoyancy of Taxation in Nepal

The two popular concepts; Elasticity and Buoyancy are frequently used in measuring the responsiveness and the productivity of taxation in a tax system with respect to change in GDP. A high elastic tax system is said to be desirable, but in most cases, the major sources of government revenue may have low elasticity in which cases the authorities must seek additional revenue by introducing discretionary changes (Mansfield, 1972). Both elasticity and buoyancy are known as automatic stabilizers. If a tax system is elastic then the tax system is called stabilized and there is no need of any corrective action by any external authority for the smooth functioning of the tax system. Thus, it is necessary to obtain the elasticity and buoyancy of taxation in Nepal. So, this study in this section has presented the elasticity and buoyancy of taxation in Nepal by using the data from 1990 to 2016.

4.2.1 Augmented Dickey Fuller Test /Unit Root Test

This study has applied OLS technique of estimation method. The OLS technique of estimation is based on asymptotic convergence theorem which assumes that the data series are stationary. However, the macroeconomic time series data are generally non-stationary. It is said that if non-stationary data are used and run the model then the result of that model may be biased and lead to failure in predicting outcomes which leads to spurious regressions where R-Squared is approximately unity and t and F statistics become significant and valid. In order to avoid the problem of spurious regression, non-stationary data must be stationary which can be made through differencing the data. For this, Augmented Dickey Fuller test is used. Each variable is tested in both form intercept and intercept with trend with null hypothesis i.e. the variable has a unit root and alternative hypothesis i.e. the variable does not have a unit root which are presented in the given following table 4.5.

Table 4.5 Augmented Dickey Fuller Tests for Unit Root

Variables	Level Form		First Difference		Remarks
	Intercept	Trend and Intercept	Intercept	Trend and Intercept	
LnGDP _t	-1.28 (0.62)	-2.62 (0.27)	-3.086 (0.00)*	-3.114 (0.04)**	I (1)
LnTR _t	0.306 (0.97)	-0.976 (0.93)	-3.371 (0.02)**	-3.603 (0.03)**	I (1)
LnTTR _t	0.490 (0.98)	-0.983 (0.92)	-3.631 (0.01)**	-3.5691 (0.05)***	I (1)
LnNTR _t	-0.827 (0.79)	-4.008 (0.02)	-6.384 (0.00)*	-6.247 (0.00)*	I (1)
LnDTR _t	0.808 (0.99)	-1.197 (0.89)	-3.893 (0.00)*	-3.772 (0.03)**	I (1)
LnIDTR _t	0.278 (0.97)	-1.043 (0.91)	-3.384 (0.02)**	-3.322 (0.00)**	I (1)

Source: Calculation using Eviews10 based on Appendix II

Note: *, **, *** show 1% and 5% level of significance and numeric value in the parenthesis (...) expresses p-values. The p-values are based on MacKinnon (1996) one-sided p-values. Mackinnon critical values for rejection of null hypothesis of a unit root are: 1% critical value = -3.689, 5% critical value = -2.972 and 10% critical value = -2.625.

In the table 4.2.1, all the variables, GDP, TR, TTR, TNTR, DTR, IDTR are expressed in natural logarithmic shows the presence of unit root in the level form which accepts the null hypothesis. However, all the variables are stationary at the 1% level of significance in first difference which rejects the null hypothesis. Thus, it is concluded that all variables are integrated of order 1, i.e. I(1). But the regression at first difference provides the results in growth but not the elasticity estimates. Since the main purpose of this study is to examine the

elasticity and buoyancy of tax, the primary tool for this would be to run the regression in the natural log linear form. Moreover, as the regression on levels has very high-adjusted R^2 it is a positive indication to apply the regression on log levels. Thus it is conclude that measures of tax revenue have the long run relationship with GDP.

4.2.2 Estimation of Elasticity Coefficients of Nepalese Taxes (1990 to 2016)

The elasticity of yield is being an important aspect of the tax structure. The unity elasticity of taxation implies that one percent change in GDP will be accomplishes by one percent change in tax revenue. If it is greater than unity implies that the percentage change in tax revenue is exceed in GDP. Similarly, a tax system is said to be elastic if the coefficient of elasticity exceeds unity, and inelastic if it is less than unity. The elasticity coefficients of major tax heads in Nepal during the study period are presented in the given table 4.6 below.

Table 4.6 Elasticity coefficient (β) of different tax heads for whole sample period

Dependent Variable	Independent Variable (Base)	Coefficient (β)	\bar{R}^2	Standard Error	t	F	D-W Test
TR	GDP(Y)	0.76	0.71	0.09	8.26	67.36	2.15
TTR	GDP(Y)	0.72	0.93	0.03	19.09	364.76	0.19
NTR	GDP(Y)	0.62	0.85	0.05	12.34	157.44	0.50
DT	GDP(Y)	0.77	0.94	0.03	21.32	454.58	0.35
IDT	GDP(Y)	0.69	0.92	0.03	18.52	342.16	0.33

Source: Calculation using Eviews10 based on Appendix IV

Note: 1% level of significance

In the table 4.6, the elasticity coefficients of different tax heads have been presented. The overall elasticity of the total revenue in tax structure for the study period is 0.76. This implies that one percent increase in country's GDP results 0.76 percent increase in total revenue. This indicates that the total revenue is not responsive to GDP. As the coefficient is positive, it can be said that total revenue in Nepal is positively influenced by GDP. The adjusted R^2 (0.71) indicates that 71 percent of total revenue in influenced by country's GDP. F and t statistics is significant at 1.0 percent level implies that the model is best fitted and relationship is reliable. That means the influence of any other independent variable to total revenue is nominal. Elasticity coefficient for total tax revenue is 0.72 which explains an inelastic relationship

between total tax revenue and the country's GDP. This shows that about a 1 percent change in GDP has contributed on an average of 0.72 percent change in total tax revenue. The values of parameters - adjusted $R^2 = 0.93$, F statistics = 364.76 and t statistics = 19.09 all justify the best fit of the model at 1 percent significance level. Similarly, Elasticity coefficient for non tax revenue is 0.62 which also explains an inelastic relationship between non tax revenue and the country's GDP. This shows that about a one percent change in GDP has contributed on an average of 0.62 percent change in non tax revenue. Both F and t statistics are significant at 1 percent level which implies the model is best fitted and relation is reliable.

The elasticity of total direct tax during the period from 1990 to 2016 has found 0.77. It signifies that about one percent increase in GDP has contributed on an average 0.77 percent increase in total direct tax collection. Adjusted R^2 is 0.94 implying that 94 percent change in total direct tax has been explained by change in explanatory variable - GDP. Both F and t statistics are significant at 1 percent. Regarding elasticity for total indirect tax is 0.69 implying that about one percent increase in the country's GDP has brought on an average 0.69 percent increase in total indirect tax. The relationship is best fit at 1 percent significance level. The above findings of indirect tax elasticity show no strong responsiveness of the tax with respect to country's GDP.

4.2.3 Estimation of Buoyancy Coefficients of Nepalese Taxes (1990 to 2016)

The buoyancy coefficient of a tax is given by the ratio of percentage change in the tax revenue to the percentage change in GDP or national income, which gives an idea about the overall increase comprising the effect of both automatic increase and of increase attributable to discretionary measures. Further, buoyancy coefficient of a tax system reflects change in revenue collection due to two factors viz. automatic growth and discretionary change. Therefore, the buoyancy coefficient of a tax is given revenue to the percentage change in national income are GDP. The buoyancy coefficients of major tax heads in Nepal during the study period are presented in the given table 4.7 below.

Table 4.7 Buoyancy coefficient (β_1) of revenue heads for the whole sample period in level form

Dependent Variable	Independent Variable (Base)	Coefficient (β_1)	\bar{R}^2	Standard Error	t	F	D-W Test
LnTR	GDP(Y)	1.25	0.99	0.01	75.51	5701.88	0.46
LnTTR	GDP(Y)	1.30	0.99	0.02	61.30	3758.57	0.36
LnNTR	GDP(Y)	1.02	0.97	0.02	34.14	1165.83	1.34
LnDTR	GDP(Y)	1.15	0.99	0.02	53.89	2903.65	0.73
LnIDTR	GDP(Y)	1.22	0.99	0.02	60.50	3660.41	0.35

Source: Calculation Using Eviews10 based on Appendix II

Note: 1 % level of significance

Table 4.7 shows the buoyancy of the different revenue heads. The buoyancy of the total revenue is 1.25 with very high level of adjusted R^2 , 0.99 which indicates that the 99 percent variation in total revenue is explained by GDP. A tax system is considered to be buoyant if the value of buoyancy coefficient is greater than unity. In this sense the total revenue can be considered as relatively buoyant with respect to the growth of economy. The t-test and F-test are significant at one percent level shows that model is best fitted and the relation is reliable. Standard error with value 0.01 shows that the coefficient is statistically significant. The buoyancy coefficient of total revenue shows that the tax system yielded a 1.25 percent change in total revenue, as a result of both automatic change and discretionary policy, for every 1.0 percent change in GDP.

Similarly, the buoyancy of the total tax revenue is also greater than unity i.e. 1.30 with very high level of adjusted R^2 , 0.99 which indicates that the 99 percent variation in total revenue is explained by GDP. Also the coefficient is significant at one percent level of significance. The coefficient of buoyancy for total tax revenue shows that for every 1.0 percent change in GDP there occurs 1.30 percent change in total tax revenue due to both automatic and discretionary measures. Like that, the coefficient of buoyancy for total non-tax revenue is

1.02 shows that slightly increasing proportion of incremental income was transferred to the government in the form of non-tax revenue. The usual t, F test and the value of standard error shows the coefficient is statistically significant at one percent level. The value of adjusted R² is 0.97 shows that 97 percent of total variation in non-tax revenue is explained by the independent variable, GDP.

Moreover, for direct tax the buoyancy coefficient has a value of 1.15, means the tax system yielded a 1.15 percent change in direct tax revenue, as a result of both automatic change and discretionary policy, for every 1.0 percent change in GDP. Thus, direct tax is buoyant because an increasing proportion of incremental income was transferred to the government in the form of direct tax over the period. On the other hand, indirect tax buoyancy coefficient is 1.22 also greater than unity shows that it is also buoyant, with satisfactory value of adjusted R², 0.99.

4.3 Contribution of Discretionary Measures

It can be observed that the elasticity coefficients of different tax heads with respect to GDP are less than unity and with high value of buoyancy coefficient gives contribution of discretionary measures in revenue collection. The table 4.8 below shows that substantial effort has made by the government to collect the required amount of revenue during the study period.

Table 4.8 Contribution of Discretionary Measures

Tax Heads	Independent Variable	Buoyancy Coefficient	Elasticity Coefficient	Discretionary Efforts
TR	GDP (Y)	1.25	0.76	0.49
TTR	GDP (Y)	1.30	0.72	0.58
NTR	GDP (Y)	1.02	0.62	0.40
DT	GDP (Y)	1.15	0.77	0.38
IDT	GDP (Y)	1.22	0.69	0.53

Source: Author's Calculation from the information of table 4.6 and 4.7

The table 4.8 shows the contribution of discretionary measures adopted by the government to mobilize the revenue. From above table, it can be said that there is no high value of discretionary efforts of all tax heads. It can be observed that the lowest degree of discretionary effort was applied in direct tax with value of 0.38, followed by non tax revenue, indirect tax revenue, and total tax revenue during the study period. Thus, higher value of

discretionary effects signifies that government has made tremendous effort to mobilize revenue through improving tax system in various ways.

The analysis of the productivity of taxation shows that there is less elastic and more buoyant in Nepalese tax system. The less elastic tax system causes many problems like lack of revenue surplus for development, widening resource gap, etc. To bridge the gap, there is increasing reliance on foreign loan which is not on favor of the country. So the government has to focus on the implementation of policies to raise the government revenue by automatic response of tax system rather than that of discretionary efforts.

CHAPTER- V

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

In this chapter a summary of findings related to the study problem and objectives and conclusion of the study are given. The summary of the findings basically presents the analysis of structure and pattern of Nepalese taxation and also presents the analysis of buoyancy, elasticity and tax effort of total revenue, total tax revenue, total non-tax revenue, direct tax revenue and indirect tax revenue for the period 1990 to 2016. Some recommendations in terms of possible policy options and further research are also provided.

5.1 Summary of the Findings

The main objective of this study was to explore the productivity of taxation in Nepal from 1990 to 2016 and also to examine the trend, pattern, and structure of taxation during the study period. The overall trend of revenue from taxation in Nepal shows that the contribution of tax revenue to GDP has been increasing from 7.04 percent in 1990 to 18.35 in 2016 with some steady rates. Similarly, the share of non-tax revenue to GDP is also found in increasing trend from 1.94 percent to 2.14 percent in 2016. Furthermore, the share of direct tax to GDP has increased from 1.32 percent in 1990 to 6.65 percent in 2016, but the share of indirect tax heightened to 12.08 in 2016 to 5.72 percent in 1990.

In terms of tax revenue ratio, the contribution of direct tax to total tax revenue has continuously risen from 18.18 percent from 1990 to 36.23 percent in 2016 which is good indication for Nepalese tax system. Likewise, the contribution of indirect tax to total revenue is found declined from 81.19 percent in 1990 to 65.85 percent in 2016.

Regarding elasticity and buoyancy, the elasticity coefficient of almost all taxes is less than unity, that is, inelastic in nature. Taxes are not responsive to change in income with all elasticity coefficients reporting below unity. In fact, the inelastic nature of the tax system in developing countries is an inherent characteristics resulting from heavy reliance on indirect taxes. In this study, the buoyancy coefficients of different tax heads are greater than one, implying discretionary change made have significant effect for faster revenue growth since the buoyancy coefficients of most of the tax heads are greater than unity, the tax structure of Nepal is said revenue buoyant. Beside this, the major findings of this study are summarized as follows.

- 1) The elasticity and buoyancy coefficients of total revenue have the value of 0.76 and 1.25 respectively.
- 2) The coefficient of elasticity for total tax revenue is 0.72 and that of buoyancy is 1.30.
- 3) Non-tax revenue has very low elasticity value of 0.62 and that of buoyancy coefficient with value of 1.02.
- 4) Indirect tax which occupies about 75.36 percent share in total tax revenue during the study period has the elasticity and buoyancy coefficient of 0.69 and 1.22 respectively. Similarly, the elasticity and buoyancy coefficient of direct tax is 0.77 and 1.15 respectively.
- 5) Thus, the entire dependent variables included in the model have less than unitary value of elasticity coefficients with buoyancy greater than unity.
- 6) GDP and tax revenue both are increasing over the year but tax revenue is not increasing as much as the GDP.
- 7) Tax revenue had played a dominant role as components of government revenue. The contribution of tax revenue to total revenue is 80.4 percent on an average while the share of it is 10.30 percent of GDP on an average during the study period.
- 8) The contribution of direct tax has been observed at 24.74 percent on an average while that of indirect tax contributed at 75.36 percent on an average during the study period. The share of direct tax in total tax revenue has increased sufficiently throughout the study period, from 18.81 percent in 1990 to 36.23 percent in 2016. Thus, the progressivism in tax system has realized significantly.

5.2 Conclusion

The ultimate goal of the underdeveloped countries like Nepal is to achieve the economic development and ensure the rapid rate of economic growth. It needs huge amount of investment in economic overheads and other development activities for which taxation is undoubtedly a primary source of revenue for the government. Taxation may be considered as basic tool in the path of economic development. However, the study revealed that Nepal has an inelastic tax structure. Taxes are not greatly responsive to changes in income with the elasticity coefficient registering below unity.

The low elasticity observed in the Nepalese tax system is explained through factors such as exemptions, tax incentives, duty waivers, low compliance and vibrant sectors of the economy which are not subject to taxation. Therefore, the automatic responsiveness of taxes to income is seen to be low. Although reforms undertaken improved tax elasticity, it was not sufficient

in generating adequate revenue required to finance the budgets. This implies that the ability of the economy to increase revenue on its own remains fairly weak requiring discretionary measures coupled with increased borrowing to make up for the shortfalls in revenue. This leads to the conclusion that, discretionary tax measures impact favorably on total tax revenue. It can therefore be deduced that a big percentage of tax revenue comes from discretionary tax policy and not from pure responsiveness of tax revenue to changes in national income.

Considering the whole study period (1990-2016), it is concluded that Nepal has generally an inelastic tax system and a tax effort which is less than one. Therefore the tax system is not revenue enhancing. That also implies that whole period was characterized by inadequate total tax revenue. The tax system needs redesigning so as to increase tax revenue generation. Inadequate tax revenue generation testifies to the fact of the persistence of national budget deficits in Nepal.

5.3 Recommendations

Nepal in general has a tax effort which is less than one. That implies it has a high tax potential. The following recommendations are made through this thesis for a sound and effective tax system, which could be considered by the concerned authorities while reforming Nepal's tax system. They are as follows:

1. The country should redesign her tax system in order to increase her tax revenue.
2. The government can widen the tax bases by introducing new taxes to items or activities that are not taxed. It can raise tax rates where is appropriate so as to mobilize more tax revenue that can help in the reduction of national budget deficit.
3. The government should come up with policies that put all domestic factor incomes under the tax net.
4. The government should fight tax evasion and inefficiency in revenue administration.
5. The government should increase its effort in domestic revenue mobilization through proper and just tax administration and education of the masses about the usefulness of tax revenue.
6. The tax rates should be competitive in comparison to other neighboring countries.

Thus, at last, the government needs full cooperation with the tax administration, the taxpayers and businessmen as well as consumers in its efforts to generate more revenue in the country.

REFERENCES

- Ashraf, M. & Sarwar, D.S. (2016). Institutional determinants of tax buoyancy in developing Nations. *Journal of Emerging Economics and Islamic Research*.
- Adhikari, S. R. (2001). Tax incidence in Nepal: An analysis using household data. *The Nepalese Journal of Publication finance and development year 32*, Vol. 2, 2001.
- African Economic Research Consortium, (1998). *Tax reforms and revenue productivity in Ghana*. The AERC, Nairobi, Kenya.
- Agrawal, G.R. (1998). *Resource mobilization in Nepal*. CEDA, Tribhuvan University, Kathmandu (Nepal).
- Ahmad, E., & Stern N. (1987). *The theory of taxation for developing countries*. Oxford University Press (U.K.).
- Bilquees, F. (2004). Elasticity and Buoyancy of the tax system in Pakistan. *The Pakistan development review*. Vol. 43, No. 1 (Spring 2004), pp. 73-93.
- Dahal, M.K. (1983). Taxation in Nepal: A study of its structure, productivity and Burden (*doctoral dissertation*). University of Bambay (India).
- Department Customs (2014). *Revenue Scenario under customs administration of Nepal (2008/09 to 2014/15)*. Department Customs, Nepal.
- Economic Survey*. (2016/17). Kathmandu: Ministry of Finance
- Eugene, N. and Chineze, E. A. (2014). Productivity of the Nigerain Tax System (1994-2013). *International Journal of Business Administration*, Vol. 6, No. 4.
- Ghimire, N. (2006). *Tax evasion and contemporary tax laws in Nepal*. Rajesh, Kathmandu (Nepal).
- Gituku, F.C. (2011). *Tax reforms and revenue productivity in Kenya*. University of Nairobi, Kenya.
- Goode, R (1984). *Government finance in developing countries*. McGraw Hill, New Delhi (India).
- Gurungharana, K.K. (1993). *Weakness of the tax policy and tax structure in Nepal*. Rajaswa, Vol.2, RTAC, HMG/N.

- Jha, H.B. (1982). *Resource mobilization and economic development in Nepal* (doctoral dissertation). University of Bihar,(India).
- Kelly, S.R. (1999). Intergovernmental revenue allocation theory and application: Application to Nepal. *Asian Journal of Public Administration*.
- Mansfield, C.Y. (1972). Elasticity and buoyancy of a tax system: A method applied to Paraguay. *International Monetary Fund Staff Paper*, 19 (2), pp. 425-426.
- Mukarram, F. (2001). Elasticity and Buoyancy of major taxes in Pakistan. *Pakistan Economic and Social Review*, Vol. 39, No. 1. pp. 75-86.
- Musa, O.D., Bulus, A., Nwokolo, C. C. & Yuni, N. (2016). Tax Buoyancy and elasticity in Nigeria: the case of aggregate tax. *International journal of development and economic sustainability*, Vol. 14, No.4, pp. 20-31.
- Nepal Rastra Bank (2016). *Elasticity and Buoyancy of taxation in Nepal: A revisit of the empirical evidence*. Nepal Rastra Bank, Research Department, Kathmandu, Nepal.
- Nepal Rastra Bank, (2014). *A Handbook of Government Finance Statistics*. Research Department, Baluwatar, Kathmandu.
- Neupane, R. R. (2005). *Income tax as an internal source of resource mobilization in Nepal* (Unpublished Master's thesis). Tribhuvan University, Central Department of Management, Kritipur, Kathmandu (Nepal).
- NPC, (2013). *Thirteen Three Year Plan Document*. Singh Durbar, Kathmandu, Nepal.
- Poudel, J. (2002). *Income tax in Nepal: A study of its structure and productivity* (Unpublished Master's thesis). Tribhuvan University, Central Department of Economics, Kritipur, Kathmandu (Nepal).
- Prasad, U. S. (2015). Nepal's Excise systems and the legal frameworks: agendas for reform. *World Customs Journal*, Vol. 9, No. 2, pp. 51-69.
- Rao, V.G. (1979). *The responsiveness of tax system in India 1960/61 to 1973/74*. Bangalore (India): Allied publisher.
- Reejal, P. R. (1976). *Revenue productivity and elasticity aspect of Nepalese taxation*. Kathmandu: Central Department of Economics, Tribhuvan University.
- Shed, S.N. (2002). *Informal economy- special taxpayer regime for small and micro business: design and implementation*. A paper presented at the third regional training workshop on taxation.
- Shende, S. N. (2002). *Informal Economy-Special Taxpayer Regime for Small and Micro Businesses: Design and Implementation*. A paper Presented at the Third Regional

Training Workshop on Taxation (United Nations and Center for Inter-American Tax Administrations (CIAT): Brasilia).

- Shumshere, A. (2008). *An analysis of tax structure and responsiveness of tax yields in Nepal* (unpublished doctoral dissertation). Tribhuwan University, Kritipur, Kathmandu (Nepal).
- Shapi, C. (1999). *The effect of tax structure on economic performance in Zambia*. A dissertation, the copper belt university School of Business.
- Singh, R.D. (1999). *Domestic resource mobilization for economic development in Nepal* (unpublished doctoral dissertation). Tribhuwan University, Kritipur, Kathmandu, (Nepal).
- Sophia, A.M., & Gomboa, J. (2001). *Development of forecasting models, corporate and individual income taxes*. Manila: Philippine Institute for Development Studies (Vol-8).
- Samuel, K.C. & Issac, K.C. (2012). The elasticity and buoyancy of tax components and tax system in Kenya. *Research Journal of finance and accounting*, Vol. 3, No. 5, 2012
- Tanawar, R. (2014). An analytical study of the relevance of Arthashastra in modern India. *ISOR Journal of Economics and Finance*, Vol. 5, No. 3, pp. 32-35.
- Timsina, N. (2007). *Tax elasticity and buoyancy in Nepal: A revisit* NRB Economic Review, Vol.12. Nepal Rastra Bank, Kathmandu, Nepal.
- Timilsina, S. (2011). *Tax evasion in Nepal*. (Unpublished master's thesis). Kathmandu: Central Department of Management, Tribhuvan University, Kirtipur, Kathmandu (Nepal).
- Uponder, M. (2008). Degree of tax buoyancy in India: an empirical study. *International Journal of Applied Econometrics and Quantitative Studies*, Vol. 5, No. 2, pp. 59-70.
- Upreti, D. P. (2004). Value Added Tax in Nepal performance and prospects. Unpublished thesis, Central Department of Economics, Tribhuvan University.

APPENDIX- I

Master Table: GDP, Total Revenue, Total Tax Revenue, Non-tax Revenue and Revenue from Direct and Indirect Taxes (Rs. in Millions)

Years	Total Revenue	Tax Revenue	Non-tax Revenue	Direct Tax	Indirect Tax	GDP
1990	9287.9	7284.1	2003.8	1369.8	5914.3	103416
1991	10730.4	8176.6	2553.8	1285	6891.6	120370
1992	13512.7	9875.6	3639.9	1487.3	8388.5	149487
1993	15148.4	11662.6	3458.8	1879.7	9782.9	171492
1994	19580.7	15371.5	4209.2	2657.4	12714.1	199272
1995	24575.2	19660	3704.5	3797	15863	219175
1996	27893.1	21668	5131.2	4585.2	17082.8	248913
1997	30373.4	24424.1	5086.2	5233.6	19190.5	280513
1998	32937.9	25926.6	5749.9	6015.3	19911.3	300845
1999	37251	28753	6256.4	7296.8	21456.2	342036
2000	42889.6	31148.3	7558.4	8551	24597.3	379488
2001	48893.6	38865	7971.5	9769.7	29095.3	441519
2002	50445.6	39332.2	9226.1	10039.3	29292.9	459443
2003	56229.7	42587	12103	10103.8	32481.2	492231
2004	62331	48175.7	12304.8	11901.9	36273.8	536749
2005	70124.1	54106.1	14770.3	13061.3	41044.8	589412
2006	72282.1	57427	13341.3	13961.5	43465.5	654084
2007	87712.1	71168	15518.5	18979.7	52188.3	727827
2008	107622.7	85147	19794.7	23070.8	62076.3	815658
2009	143474.4	117051.8	22892.2	34552.6	82499.2	988272
2010	179945.8	159785.4	18206.5	41760.5	114530.2	1192774
2011	199819	177227.2	21149.2	48640.9	124114.3	1366954
2012	244561.1	211722.6	32651.5	66906.7	144811.6	1527344
2013	296776.5	259214.9	36806.2	81937.5	177206.1	1695011
2014	363493.4	312439.9	50483.7	97065.5	211713.2	1964540
2015	407947.7	355935.5	49910.7	113991.2	241951.8	2130150
2016	469425.5	412424.4	48001.1	149494.4	271553.9	2247427

Source: Budget Speech, MoF and Government Finance Statistics, NRB.

APPENDIX- II

Log Transformed Value of Variables

Years	LNTR	LNTXR	LNTR	LNDTR	LNIDT	LNGDP
1990	9.14	8.89	7.6	7.22	8.69	11.55
1991	9.28	9.01	7.85	7.16	8.84	11.7
1992	9.51	9.2	8.2	7.3	9.03	11.91
1993	9.63	9.36	8.15	7.54	9.19	12.05
1994	9.88	9.64	8.35	7.89	9.45	12.2
1995	10.11	9.89	8.22	8.24	9.67	12.3
1996	10.24	9.98	8.54	8.43	9.75	12.42
1997	10.32	10.1	8.53	8.56	9.86	12.54
1998	10.4	10.16	8.66	8.7	9.9	12.61
1999	10.53	10.27	8.74	8.9	9.97	12.74
2000	10.67	10.35	8.93	9.05	10.11	12.85
2001	10.8	10.57	8.98	9.19	10.28	13
2002	10.83	10.58	9.13	9.21	10.29	13.04
2003	10.94	10.66	9.4	9.22	10.39	13.11
2004	11.04	10.78	9.42	9.38	10.5	13.19
2005	11.16	10.9	9.6	9.48	10.62	13.29
2006	11.19	10.96	9.5	9.54	10.68	13.39
2007	11.38	11.17	9.65	9.85	10.86	13.5
2008	11.59	11.35	9.89	10.05	11.04	13.61
2009	11.87	11.67	10.04	10.45	11.32	13.8
2010	12.1	11.98	9.81	10.64	11.65	13.99
2011	12.21	12.09	9.96	10.79	11.73	14.13
2012	12.41	12.26	10.39	11.11	11.88	14.24
2013	12.6	12.47	10.51	11.31	12.09	14.34
2014	12.8	12.65	10.83	11.48	12.26	14.49
2015	12.92	12.78	10.82	11.64	12.4	14.57
2016	13.06	12.93	10.78	11.92	12.51	14.63

Source: Author's Calculation using Excel

APPENDIX- III

Percentages of Different Tax Heads

Years	GDP	Total Revenue	% of GDP	Tax Revenue	% of GDP	%TR	NTR	Direct Tax	% of TR	Indirect Tax	% of TR
1990	103416	9287.9	8.98	7284.1	7.04	78.43	2003.8	1369.8	18.81	5914.3	81.19
1991	120370	10730.4	8.91	8176.6	6.79	76.20	2553.8	1285	15.72	6891.6	84.28
1992	149487	13512.7	9.04	9875.6	6.61	73.08	3639.9	1487.3	15.06	8388.5	84.94
1993	171492	15148.4	8.83	11662.6	6.80	76.99	3458.8	1879.7	16.12	9782.9	83.88
1994	199272	19580.7	9.83	15371.5	7.71	78.50	4209.2	2657.4	17.29	12714.1	82.71
1995	219175	24575.2	11.21	19660	8.97	80.00	3704.5	3797	19.31	15863	80.69
1996	248913	27893.1	11.21	21668	8.71	77.68	5131.2	4585.2	21.16	17082.8	78.84
1997	280513	30373.4	10.83	24424.1	8.71	80.41	5086.2	5233.6	21.43	19190.5	78.57
1998	300845	32937.9	10.95	25926.6	8.62	78.71	5749.9	6015.3	23.20	19911.3	76.80
1999	342036	37251	10.89	28753	8.41	77.19	6256.4	7296.8	25.38	21456.2	74.62
2000	379488	42889.6	11.30	31148.3	8.21	72.62	7558.4	8551	27.45	24597.3	78.97
2001	441519	48893.6	11.07	38865	8.80	79.49	7971.5	9769.7	25.14	29095.3	74.86
2002	459443	50445.6	10.98	39332.2	8.56	77.97	9226.1	10039.3	25.52	29292.9	74.48
2003	492231	56229.7	11.42	42587	8.65	75.74	12103	10103.8	23.73	32481.2	76.27
2004	536749	62331	11.61	48175.7	8.98	77.29	12304.8	11901.9	24.71	36273.8	75.29
2005	589412	70124.1	11.90	54106.1	9.18	77.16	14770.3	13061.3	24.14	41044.8	75.86
2006	654084	72282.1	11.05	57427	8.78	79.45	13341.3	13961.5	24.31	43465.5	75.69
2007	727827	87712.1	12.05	71168	9.78	81.14	15518.5	18979.7	26.67	52188.3	73.33
2008	815658	107622.7	13.19	85147	10.44	79.12	19794.7	23070.8	27.10	62076.3	72.90
2009	988272	143474.4	14.52	117051.8	11.84	81.58	22892.2	34552.6	29.52	82499.2	70.48
2010	1192774	179945.8	15.09	159785.4	13.40	88.80	18206.5	41760.5	26.14	114530.2	71.68
2011	1366954	199819	14.62	177227.2	12.97	88.69	21149.2	48640.9	27.45	124114.3	70.03
2012	1527344	244561.1	16.01	211722.6	13.86	86.57	32651.5	66906.7	31.60	144811.6	68.40
2013	1695011	296776.5	17.51	259214.9	15.29	87.34	36806.2	81937.5	31.61	177206.1	68.36
2014	1964540	363493.4	18.50	312439.9	15.90	85.95	50483.7	97065.5	31.07	211713.2	67.76
2015	2130150	407947.7	19.15	355935.5	16.71	87.25	49910.7	113991.2	32.03	241951.8	67.98
2016	2247427	469425.5	20.89	412424.4	18.35	87.86	48001.1	149494.4	36.25	271553.9	65.84

Source: Author's Calculation using Excel

APPENDIX- IV

Adjusted Total Revenue, Adjusted Revenue from Direct and Indirect Taxes and Individual Tax (Rs. in Millions)

Fiscal Year	GDP	Total Revenue	Tax Revenue	Non-Tax Revenue	Direct Tax	Indirect Tax
1990	103416	9287.9	7284.1	2003.8	1369.9	5914.3
1991	120370	10896.5	8267.6	2253.8	1453.6	6891.6
1992	149487	12974.5	9544.5	3418.8	1574.9	7968.7
1993	171492	13946.3	10751.1	3185.6	1940.3	8827.6
1994	199272	16372.4	12784.7	3577.5	2296.5	10489.2
1995	219175	20043.6	15917	4109.8	2933.1	12987.3
1996	248913	21598	16490.2	5138.7	3090.1	13393
1997	280513	2374.1	16849.3	4504.6	3295.6	13520.6
1998	300845	21802.6	16836.7	4979	3546.5	13224.2
1999	342036	21241	15730.2	5609.5	3273	12351.2
2000	379488	22921	16917.5	6123.6	3703.5	13054.5
2001	441519	23633.5	17798.6	5884.01	3810.4	13836.7
2002	459443	22884.1	17257.6	5659	3792	13296.6
2003	492231	24461.2	17823.7	6038.5	3438.6	14307
2004	536749	24937.2	18849.9	5326.3	3805.5	14930.9
2005	589412	26389.2	19888.9	6041	3697.5	16143
2006	654084	26142.1	20076.4	5456.7	3974.3	15984.6
2007	727827	30013.4	23574	5961.9	5076.3	18231.4
2008	815658	35364.6	26940.4	7445.5	5765.4	20875
2009	988272	42946.1	33131.7	8530	7556	25052.9
2010	1192774	48511	40753.1	6610.9	7737	32697.3
2011	1366954	49220.3	40802.2	7426.1	8030	32367.8
2012	1527344	59796.8	47976.7	11449.9	9872	37443.7
2013	1695011	72904.6	58738.6	12906.9	12487.8	45287.4
2014	1964540	88788.5	69557.4	17676.7	14746.2	53678.9
2015	2130150	102658.9	82443.5	23885.7	16442.2	61687.8
2016	2247427	116587.3	94558.4	26432.1	19587.4	69847.9

Source: Budget Speech, MoF and Government Finance Statistics, NRB.
Calculated by using Sahota method

APPENDIX- V

Log Transformed Value of Adjusted Variables

Years	GDP	LNTR	LNTTR	LNNTR	LNDTR	LNIDTR
1990	11.55	9.14	8.89	7.60	7.22	8.69
1991	11.70	9.30	9.02	7.72	7.28	8.84
1992	11.91	9.47	9.16	8.14	7.36	8.98
1993	12.05	9.54	9.28	8.07	7.57	9.09
1994	12.20	9.70	9.46	8.18	7.74	9.26
1995	12.30	9.91	9.68	8.32	7.98	9.47
1996	12.42	9.98	9.71	8.54	8.04	9.50
1997	12.54	7.77	9.73	8.41	8.10	9.51
1998	12.61	9.99	9.73	8.51	8.17	9.49
1999	12.74	9.96	9.66	8.63	8.09	9.42
2000	12.85	10.04	9.74	8.72	8.22	9.48
2001	13.00	10.07	9.79	8.68	8.25	9.54
2002	13.04	10.04	9.76	8.64	8.24	9.50
2003	13.11	10.10	9.79	8.71	8.14	9.57
2004	13.19	10.12	9.84	8.58	8.24	9.61
2005	13.29	10.18	9.90	8.71	8.22	9.69
2006	13.39	10.17	9.91	8.60	8.29	9.68
2007	13.50	10.31	10.07	8.69	8.53	9.81
2008	13.61	10.47	10.20	8.92	8.66	9.95
2009	13.80	10.67	10.41	9.05	8.93	10.13
2010	13.99	10.79	10.62	8.80	8.95	10.40
2011	14.13	10.80	10.62	8.91	8.99	10.38
2012	14.24	11.00	10.78	9.35	9.20	10.53
2013	14.34	11.20	10.98	9.47	9.43	10.72
2014	14.49	11.39	11.15	9.78	9.60	10.89
2015	14.57	11.54	11.32	10.08	9.71	11.03
2016	14.63	11.67	11.46	10.18	9.88	11.15

Source: Author's Calculation

APPENDIX- VI

Elasticity Coefficients of Different Taxes Heads

Dependent Variable: LNTR
 Method: Least Squares
 Date: 04/05/18 Time: 22:05
 Sample: 1 27
 Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.129598	1.229165	0.105436	0.9169
LNGDP	0.765255	0.093220	8.209109	0.0000
R-squared	0.729406	Mean dependent var		10.19667
Adjusted R-squared	0.718583	S.D. dependent var		0.817327
S.E. of regression	0.433582	Akaike info criterion		1.237715
Sum squared resid	4.699832	Schwarz criterion		1.333703
Log likelihood	-14.70916	Hannan-Quinn criter.		1.266257
F-statistic	67.38946	Durbin-Watson stat		2.153991
Prob(F-statistic)	0.000000			

Dependent Variable: LNTTR
 Method: Least Squares
 Date: 04/05/18 Time: 21:45
 Sample: 1 27
 Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.489396	0.500405	0.977999	0.3374
LNGDP	0.724813	0.037951	19.09872	0.0000
R-squared	0.935858	Mean dependent var		10.02444
Adjusted R-squared	0.933292	S.D. dependent var		0.683432
S.E. of regression	0.176515	Akaike info criterion		-0.559629
Sum squared resid	0.778943	Schwarz criterion		-0.463641
Log likelihood	9.554995	Hannan-Quinn criter.		-0.531087
F-statistic	364.7612	Durbin-Watson stat		0.198455
Prob(F-statistic)	0.000000			

Dependent Variable: LNNTR
Method: Least Squares
Date: 04/05/18 Time: 21:48
Sample: 1 27
Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.459545	0.661506	0.694695	0.4937
LNGDP	0.629472	0.050169	12.54708	0.0000
R-squared	0.862961	Mean dependent var		8.740370
Adjusted R-squared	0.857479	S.D. dependent var		0.618096
S.E. of regression	0.233343	Akaike info criterion		-0.001426
Sum squared resid	1.361226	Schwarz criterion		0.094562
Log likelihood	2.019249	Hannan-Quinn criter.		0.027116
F-statistic	157.4292	Durbin-Watson stat		0.506587
Prob(F-statistic)	0.000000			

Dependent Variable: LNDTR
Method: Least Squares
Date: 04/05/18 Time: 21:50
Sample: 1 27
Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.775391	0.478753	-3.708364	0.0010
LNGDP	0.774137	0.036309	21.32092	0.0000
R-squared	0.947871	Mean dependent var		8.408519
Adjusted R-squared	0.945786	S.D. dependent var		0.725299
S.E. of regression	0.168878	Akaike info criterion		-0.648095
Sum squared resid	0.712993	Schwarz criterion		-0.552107
Log likelihood	10.74928	Hannan-Quinn criter.		-0.619553
F-statistic	454.5816	Durbin-Watson stat		0.353186
Prob(F-statistic)	0.000000			

Dependent Variable: LNDTR
Method: Least Squares
Date: 04/05/18 Time: 21:52
Sample: 1 27
Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.631034	0.495519	1.273480	0.2146
LNGDP	0.696168	0.037580	18.52481	0.0000
R-squared	0.932096	Mean dependent var		9.789259
Adjusted R-squared	0.929380	S.D. dependent var		0.657746
S.E. of regression	0.174792	Akaike info criterion		-0.579252
Sum squared resid	0.763807	Schwarz criterion		-0.483264
Log likelihood	9.819904	Hannan-Quinn criter.		-0.550710
F-statistic	343.1686	Durbin-Watson stat		0.207340
Prob(F-statistic)	0.000000			

APPENDIX- VII

Buoyancy Coefficients of Different Taxes Heads

Dependent Variable: LNTR
 Method: Least Squares
 Date: 04/03/18 Time: 23:27
 Sample: 1 27
 Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.389800	0.218346	-24.68470	0.0000
LNGDP	1.250414	0.016559	75.51079	0.0000
R-squared	0.995635	Mean dependent var		11.05963
Adjusted R-squared	0.995460	S.D. dependent var		1.143084
S.E. of regression	0.077020	Akaike info criterion		-2.218305
Sum squared resid	0.148304	Schwarz criterion		-2.122317
Log likelihood	31.94711	Hannan-Quinn criter.		-2.189763
F-statistic	5701.880	Durbin-Watson stat		0.458282
Prob(F-statistic)	0.000000			

Dependent Variable: LNTXR
 Method: Least Squares
 Date: 04/03/18 Time: 23:30
 Sample: 1 27
 Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.281581	0.279903	-22.44202	0.0000
LNGDP	1.301424	0.021228	61.30724	0.0000
R-squared	0.993392	Mean dependent var		10.83889
Adjusted R-squared	0.993128	S.D. dependent var		1.191057
S.E. of regression	0.098734	Akaike info criterion		-1.721582
Sum squared resid	0.243712	Schwarz criterion		-1.625594
Log likelihood	25.24135	Hannan-Quinn criter.		-1.693039
F-statistic	3758.578	Durbin-Watson stat		0.369307
Prob(F-statistic)	0.000000			

Dependent Variable: LNNTR

Method: Least Squares

Date: 04/03/18 Time: 23:34

Sample: 1 27

Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.174439	0.394871	-10.57167	0.0000
LNGDP	1.022523	0.029947	34.14431	0.0000

R-squared	0.979006	Mean dependent var	9.277037
Adjusted R-squared	0.978167	S.D. dependent var	0.942659
S.E. of regression	0.139289	Akaike info criterion	-1.033349
Sum squared resid	0.485033	Schwarz criterion	-0.937361
Log likelihood	15.95021	Hannan-Quinn criter.	-1.004807
F-statistic	1165.834	Durbin-Watson stat	1.339778
Prob(F-statistic)	0.000000		

Dependent Variable: LNDTR

Method: Least Squares

Date: 04/03/18 Time: 23:35

Sample: 1 27

Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.76827	0.375456	-28.68053	0.0000
LNGDP	1.534371	0.028475	53.88548	0.0000

R-squared	0.991464	Mean dependent var	9.416667
Adjusted R-squared	0.991122	S.D. dependent var	1.405615
S.E. of regression	0.132440	Akaike info criterion	-1.134184
Sum squared resid	0.438510	Schwarz criterion	-1.038196
Log likelihood	17.31149	Hannan-Quinn criter.	-1.105642
F-statistic	2903.645	Durbin-Watson stat	0.730344
Prob(F-statistic)	0.000000		

Dependent Variable: LNIDT

Method: Least Squares

Date: 04/03/18 Time: 23:37

Sample: 1 27

Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.551583	0.266819	-20.80656	0.0000
LNGDP	1.224282	0.020236	60.50133	0.0000

R-squared	0.993216	Mean dependent var	10.55407
Adjusted R-squared	0.992945	S.D. dependent var	1.120557
S.E. of regression	0.094119	Akaike info criterion	-1.817325
Sum squared resid	0.221460	Schwarz criterion	-1.721337
Log likelihood	26.53389	Hannan-Quinn criter.	-1.788783
F-statistic	3660.412	Durbin-Watson stat	0.353859
Prob(F-statistic)	0.000000		