A
THESIS
ON

THE INCREASING ENERGY LOSSES & OPERATING EXPENSES AND ITS IMPACTS IN PROFITABILITY OF NEPAL ELECTRICITY AUTHORITY

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RECOMMENDATION

This is to certify that the thesis
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Entitled

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Has been presented and approved by this department in the prescribed format of faculty of management. This thesis is forwarded for examination.

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DECLARATION

I here-by declare that the work reported in this thesis entitled " THE INCREASING ENERGY LOSSES & OPERATING EXPENSES AND ITS IMPACTS IN PROFITABILITY OF NEPAL ELECTRICITY AUTHORITY " submitted to Makawanpur Multiple campus, Faculty of management, Tribhuvan University is the original work done in the form of partial fulfillment of the requirements for the Master of Business Studies under the supervision of Mr. Bin Bahadur Raut & Mr. Jayaram Devkota, Lecturers of Makawanpur Multiple Campus.

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LIST OF ABBREVIATIONS

ACP	Average Collection Period
A.D	Anno Domini (Christian Era)
ADB	Asian Development Bank
B.S	Bikram Samvat
Co.	Company
CR	Current Ratio
D/E	Debt-Equity
D/TA	Debt-Total Assets
EBIT	Earning Before Interest and Tax
EBT	Earning Before Tax
EAT	Earning After Tax
FATOR	Fixed Assets Turnover Ratio
GDP	Gross Domestic Product
GWh	Giga Watt
GoN	Government of Nepal
ie.	That is to say
ITR	Inventory Turnover Ratio
KV	Kilo Volt
KW	Kilo Watt
Ltd.	Limited
MW	Mega Watt
NEA	Nepal Electricity Authority
NOR	Net Operating Ratio
PE	Public Enterprise
PR	Profitability Ratio
QR	Quick Ratio
RoTA	Return on Total Assets
TATOR	Total Assets Turnover Ratio
UN	United Nations
USA	United States of America
PPA	Power Purchase Agreement
PPP	Public Private Partnership

Chapter –I

INTRODUCTION

1.1 General Background

Nepal is considered to be economically less privileged and less developed among the countries in the world with around 240 US dollar per capita incomes. Recently, Nepal has adopted the path of economic development through liberalization for the economic growth of the nation. However, it is a known fact that any strategy for economic development requires a steady supply of funds for productive investment. Productive investment In other words refers to the investment venture in productive enterprises. Thus, for the development of the country, many of the business firms have been established as public enterprises as well as private under Company Act 1964.

The development of a nation largely depends on its economic development. Thus, the primary goal of any nation, including Nepal, is rapid economic development to promote welfare of the people and nation as well. This requires productive activities, which in turn is the result of the investment venture in productive enterprises. The establishment of these enterprises needs a huge amount of funds. Existing enterprises and companies with the economy can be viewed as productive enterprises that operate with equity and debt funds. The decision making process of choosing funds with the best financial mix among various alternatives plays a crucial role in the capital investment decision of the firm.

The capital structure concept has an important place in the theory of financial management. The term capital structure is also known as financial structure or financial plan or leverage. The financial decision of a firm relates to choice of proportion debt and equity to fiancé the investment requirement. A proper balance between debt and equity is necessary to ensure a trade-off between risk and return to the shareholders. A firm should select such a financing mix, which maximizes the shareholders mix. A capital structure with reasonable proportion of debts and equity is called optimal capital structure. However, the capital structure decision affects the total value of firm. The optimal capital structure and its implication are more noticeable.

In almost all public enterprises, capital structure continued to remain a very indeterminate problem in view of the lack of a guided criterion determining it. The various reports and official documents relating to public enterprises structure the maintenance of ad-hoc capital structure to the extent that neither the government nor the public enterprises themselves have been serious in the appropriate determination of capital structure.

Nepalese companies have not adopted proper combination of capital structure policy. The firm's objective to maximize the wealth of shareholders or return on equity is not met by Nepalese companies because in most of the companies, there is no existence of debts in their capital structure and equity capital is only source of financing where as in some cases the proportion of debt is very high which creates the financial burden of the firm. On the other hand, it is very low in some cause for instance, 9 companies out of 43 listed have used long-term debt in capital structure.
From the above presentation, we can say Nepalese companies do not take capital structure concept seriously. Therefore, some of the companies went into bankruptcy and some of the

companies have been suffering from losses due to huge among of interest payment. Thus appropriate capital structure should be managed for sound health of the company with proper combination of capital structure components. In the context of Nepal, public utility service organization like Nepal Electricity Authority is playing major role in the development of country.

1.2 Public Enterprises in Nepal

Public enterprises have assumed significant role in almost every country of the world, yet there have so far been no standard definition of its own. Different agencies and government to suit their own respective situation have defined the term 'Public Enterprises (PE)' in their own way. UN has defined PE as "those organization, namely governmental enterprises and public corporations, which are entirely or mainly owned and/or controlled by the public authorities consisting of establishment which by virtue of their kind of activities, technology and mode of operation are classified as industries."

According to Laxmi Narayan, "PEs is autonomous bodies which are owned and managed by the government and which provide goods or services for a price. The ownership with the government should be 51 percent or more to make an entity PE."

Public enterprises play a vital role in most developing countries. The role of public enterprises differs from country to country basically due to political philosophy of existing governments. Public enterprises play a major role in achieving the twin objectives of social and economic development envisaged in the national policy. The role of public enterprises in stimulating and augmenting the pace of economic growth in developing countries can hardly be under estimated.

Public enterprise comes into existence either by the way of deliberate policy of the government to bring certain activities under strict government control by creating new institution or by nationalizing them from private sector. Reviewing the history, we can find most of the PEs is well created by the government itself to manage certain key sectors of the economy.

PEs in Nepal constitutes a vital instrument for the socio-economic development of the country. It enjoys a strategic and crucial position in our mixed economy. They have been established in many sectors for the overall development of the country with different goals and objectives. Nepal Bank Ltd., a commercial bank was the first PE to have separate legal status in Nepal. During world war second, some other PEs were established, however, they could not make substantial progress. Nepal started its planned economic development in 1956 with the launching of first five years plan. Since then, the number of PEs, has increased substantially in the various fields of national economy.

There were 64 PEs before the privatization program of Government of Nepal and now there are 42 PEs. The PEs is dominant in production and supply of sugar, cement, cigarettes, agricultural tools, Petroleum products and all public utilities. PEs of Nepal can be categorized as,

1. Statutory Corporation
2. Government Companies
3. Departmental Undertakings.

Among 42 existing PEs, there are public utility PEs, namely

i. Nepal Electricity Authority
ii. Nepal Oil Corporation
iii. Nepal Drinking Water Corporation.

1.3 Statement of Problem

It is very difficult to assess the efficiency of PEs in view of their economic as well as socio-development goals. The difficulty is further complicated by the involvement of interest parties with PEs. Different interest parties involves with its own objectives. All these objectives of different diverse interest parties ought to be fulfilled in a competitive environment by the management of respective PEs. Public enterprises in Nepal have been created to build infrastructure for development and to supplement private sector and operate as a model for efficient use of resources and to generate surplus for self-expansion and contribution to national treasury. In order to realize these objectives, PEs has to be efficient in the utilization of their resources.

Finance is one of the most important functional areas of an enterprise. It is concerned with generation, transmission, distribution and other functions of any PEs including NEA. International lending agencies, Government of Nepal financing and self-financing are the major sources of finance mobilized by NEA. NEA is the largest government enterprise in Nepal. Being a PE, it has been financed by government and several bilateral and multilateral donor agencies. In this current pace of privatization, government still holds the good rational to keep it under public sector. The government plan clearly states that it will gradually privatize PEs except those where the government undertaking is inevitable. Thus NEA becomes one of the main sectors of PEs, which the government will privatize, in later stage. However, the introduction of private sector will not be prevented from participation in these areas. The government will not control the price of goods and services produced by such enterprises. At this juncture it is understandable that NEA, although is a government undertaking and has a possibility to remain as it in future, may not remain untouched by this new environment. NEA must be able to generate fair rate of return and surplus on its own. For this purpose it becomes imperative to be financially sound and independent at least in terms of paying interest on debts, operation and maintenance expenditures, administrative expenses and generating desirable rate of return on capital employed.

Industrialization without electricity is difficult to be imagined. In this context, NEA has great role to pay than any other PEs as most of the industries depend on power supply. In this sense NEA has no difficulty in selling its product and services as the demand of power supply is always growing. NEA gets the highest potential to further growth and expansion, as it does have no market competitions. Despite these facts, the performance of NEA is not satisfactory. The loss of electricity is very serious problem of NEA. Average 25 percentage of energy is loss and loss is in increasing series. Other main problem of NEA is higher operating cost. The operating expenses is also increase every year. In the context, the study of NEA primarily focuses on the loss reduction, operation expenses reduction, generating rate of return on capital investment and internal revenue generation. This study confines to the problem of financial operation and management of NEA. The present study will make a modest attempt to have an insight over the problem of financial management of NEA as well

as to recommend some concrete suggestions for the improvement in overall financial performance through financial analysis. The study tries to seek answer to the following question:

- Is NEA in a position to reduce its loss?
- Why loss is increasing in every year?
- Why the operating expenses is increasing?
- How efficient has NEA been able to use its assets?

1.4 Objectives of the Study

The study basically aims to evaluate losses, operating cost and its effect in the financial position of NEA and to suggest recommendation based upon it. The specific objectives of this study will be:

- To analyze the losses and find out the loss reduction efforts.
- To find out why operating expenses is increasing in every year.
- To find out the past and present challenges undergone by NEA.
- To provide some suggestions based on the findings for the improvement of financial performance.

1.5 Need and Importance of the Study

Analysis of financial position and statement is a crucial part of financial decision-making process of a business enterprises. Poor financial management affects adversely on liquidity, turnover and profitability. It is required to measure the financial position of the enterprise periodically in order to ensure smooth functioning of an enterprise. Nepal Electricity Authority (NEA) is an enterprise of great national concern. Thus, this study is made to evaluate the financial position of NEA.

During tenth five-year plan Government of Nepal provided high priority to the energy sector. A part from the medium mega hydropower projects, emphasis has been laid for the development of small hydropower projects as well. Development of small hydropower projects is essential not only for reducing regional imbalance but also for arresting the migration of population from the hills to the terrain region.

Among the different natural resources available in Nepal, water resource is the most important. By possessing nearly 2.27 percent of the world's water resources. Nepal is the second richest country in water resources. The theoretical hydropower potential of Nepal is 83,000MW of which an estimated 614.979MW is exploited which is less that 1% of the total capacity. One of the major reasons for the rampant poverty and backwardness of the Nepalese economy is the power deficit. Shortage of power creates multifarious problems in the development of agriculture, industry, trade and other sector's of the economy.

Nepal Electricity Authority (NEA) is one of the largest enterprises in Nepal. It is a capital-intensive institution and cannot implement its own investment plan with its internal resources. Its financial position has a significant impact upon the electricity generation in

Nepal. Theoretically, the NEA is a monopolistic institution and it had enjoyed the monopoly power all over the years. As a firm it should generate profits, however, being a public-utility-concerned, it should be service oriented as well. Besides, NEA should earn some surplus for the sake of repairing and maintenance. There should be trade-off between cost and service.

The changing socio-economic scenario and the current policies of Government of Nepal in the power sector have encouraged private enterprises to grow and to participate in this sector as well. In other words, NEA will have to face competition in few years back as private sectors would emerge and it would not be able to enjoy the monopoly like now.

The entry of Australian Snowy Mountain Engineering Corporation with their venture to design and implement the 750MW West Seti, Butwal Power Company's Enterprise with 60MW Khimti and the possible joint venture of "Harja" Engineering of USA with a local group to promote the 36MW Bhotekoshi etc are the examples of gradual mushrooming of the private sector in large, medium and small hydropower projects in Nepal.

This study will be useful to provide information and to draw the attention of NEA managements regarding what can be done for reduction of losses and operating expenses further strengthening the financial position of NEA. This study is expected to be helpful to the private and non-governmental agencies, which are willing to invest in hydropower projects in Nepal.

This study is believed to be an important effort to identify losses reduction efforts and operating expenses reduction. It also find out an actual trend of financial position of NEA and is expected to provide some appropriate measure to solve financial problems of NEA, if any.

1.6 Limitations of the Study

In spite of the conceptualization made, analysis performed and generalization drawn regarding the financial performance, the study may have some constraints. The study will be limited by following factors.

- The study will cover a period of 10 years from fiscal year 1997 to 2006.
- The study will be based on secondary data; therefore, the accuracy of results and conclusions highly depends upon the reliability of these data.
- The evaluation is made through the analysis of financial statement published and presented by NEA.
- As the title specifies the study covers only losses, operating expenses and its effects in the financial position of NEA.
- Since the study is mainly concerned with NEA, the conclusion drawn from the study, findings and suggestions may not be applicable to any other private or public enterprises.
- This study may not be precise as it is to fulfill the partial requirement of the MPA program.
- Because of resource constraint, this study is not comprehensive neither extensive.

1.7 Organization of Chapters

The aim of the dissertation is to explain the financial position of Nepal Electricity Authority. The study has been divided into five chapters. Each chapter will devote to some aspects of the study.

The first chapter deals with the initial proposal of the thesis incorporated with a view to explain in detail the aspect of hydropower development and a brief overview of NEA. It is focused on the statement of problem, importance of study, objectives of the study, limitation of the study. Chapter two reviews available literature regarding findings and recommendations of previous research work made in respect of NEA. Research methodology is discussed in the third chapter, which includes research design, period covered, types and sources of data, data collection procedure, methods of analysis and analytical tools used. In the fourth chapter, data collected through various sources have been presented. It mainly consists the analysis and presentations of collected data and information through definite course of research methodology. The generated results after the application of research method are analyzed and interpreted in this chapter. Ultimately, the fifth and the last chapter of the study covers summary, conclusions of the study and recommendations and suggestions for the further improvement. Besides these, bibliography and appendices are also included.

Chapter -II

REVIEW OF LITERATURE

2.1 Introduction

The review of literature is a fundamental part of the planning of the study. The main purpose of literature review is to find out what works have been done in the area of the research problem and what have to be done in the field of the research study being undertaken. Every research requires a clear-cut idea on the problem of study and its solution, which emerges from the review of literature. "Scientific research must be based on post knowledge. The previous studies cannot be ignored because they provide the foundation of the present study."

This chapter reviews the available literature relating to Nepal Electricity Authority and view expressed by various scholars and researchers on the profitability and financial performance of public enterprises. So far as analysis of financial performance in the context of Nepalese enterprises is concerned, some studies have been undertaken by the management experts and students describing the financial performance of public enterprises.

Power plays significant role in the sustainable development of an economy that drives society towards the path of modernization. Nepal being one of the rich countries in hydropower sector, many important literatures are available in this field. Some of the notable literatures relevant to the study are reviewed in this study to identify the relevance of the present study.

2.2 Hydro Power in Nepal

2.2.1 Potential

Based on an average rainfall of about 1400mm, 174 billion cubic meters of water per year is assumed to be surface run-off from Nepal. There are about 6000 big and small rivers of three main river systems namely Gandaki, Koshi & Karnali including some southern rivers and Two border rivers Mechi to the east and Mahakali to the west. Due to the high concentration and intensity of perception during the monsoons period, about 72% of the total run-off is instantaneous, while the rest is conserved as snow and ground water which drains in to the rivers during the dry season. All the major river basins/except those of the southern rivers originate from the Himalaya or the Tibetan plateau. The total run-off per year from Nepal, including run-off from Tibetan catchments is estimated to be about 200 billion cubic meters. Based on that estimation, there exists a theoretical of 83000MW and economically viable potential about 42000 MW in the present context.

Theoretical Hydropower potential (.000MW)

River Basin	Major rivers with catchment areas of an 1000 Sq.Km. or more	Major rivers with catchment areas of an 3000 to 1000 Sq.Km.	Total
Sapta Koshi	18.75	3.00	22.35
Sapta Gandaki	17.95	2.10	20.65
Karnali & Mahakali	32.68	3.50	36.18
Southern rivers	3.07	1.04	4.11
Total	**72.45**	**10.84**	**83.29**

Source: Vidyut (vol.2 falgun 2058)

2.2.2 Hydropower Development and Classification

Although the hydropower has been generated in Nepal since the construction of the Pharping hydropower plant way back in 1911, expansion of hydropower has been very slow. The Sundarijal 640 KW and Panauti 2400 hydropower plants come into operation after long intervals of 25 and 29 years. As the demand of electricity increased mainly onwards from 60's bigger hydropower plants were constructed.

In ten years period from 1965 to 1975 the installed capacity of hydropower increased almost 20 times.

Establishment of small hydel development board in 1975 to electricity remote laying district centers through isolated small scale hydropower projects led to categorization of hydropower plants in Nepal as follows.

- Plant having capacity less then 100KW : mini-micro hydropower
- Plant having capacity from 100KW to 5000KW : small hydropower
- Plant having capacity from 5000KW to 300MW : Medium hydropower
- Plant having capacity more than 300MW : Big hydropower

This classification is not so strict. Presently, hydropower schemes are considered as small one if they have capacity between 100KW and 10000KW (10MW). The objective of this classification is that mini-micro hydropower plants are meant for isolated rural areas and grid connection, medium hydropower plants are envisaged for national demand of power and energy and large hydropower projects are planned for long term national demand and provision of export to neighboring countries.

(I) Mini-Micro Hydropower

Mini-micro hydropower plants are popular and economical in scattered and isolated settlements in Nepal. There are number of agencies and institutions including NGOs (Non Governmental Organization) and INGOs (International Non Governmental Organizations) supporting in the implementation of mini-micro hydropower plants. Government of Nepal is providing subsidy up to 75% for electromechanical equipment through ADB/N (Agricultural Development Bank, Nepal) to interested developers of such schemes. Apart from ADB/N, Denish funded Energy support Assistance Program (ESAP) and UNDPs Rural Energy Development program (REDP), involved in

implementation of mini-micro hydropower schemes in hilly areas of Nepal. There are about 30,000 traditional water mills and ADB/N has finished for more then 500 water turbines ranging from 5 to 20 KW, mostly of course flow type. Micro hydropower plants have an average installed capacity of about 6KW, with an average US$ 550 per KW about 90% of Nepalese population lives in rural areas and only about three percent of rural population has access to electricity. These days portable type peltry sets also are popular in remote areas of Nepal that have capacity from few hundred watts to one kilowatt.

(II) Small Hydropower

In 1975 Government of Nepal established small hydel development board (SHDB) mainly to electricity the remote laying district centers through isolated small-scale hydropower plants. Extension of Nepal Grid System to these centers is not economically viable. Presently all 75 district headquarters have been electrified either by the construction of isolated small hydropower plants or extension of national grid system. There are all together 48 (including private sector) small hydropower plants in Nepal and few of them have been connected to the national grid system and two isolated SHPs are under construction by NEA. Formation of NEA took place in 1985 by merging electricity department, electricity corporation and electricity development boards. After this development the NEA has had been entrusted to carryout planning, survey, design, construction, operation and maintenance of electricity generation and distribution facilities throughout Nepal. Since then the activities of SHDB was handed over to small hydropower department within the jurisdiction of NEA. Apart from Government of Nepal, internal resources, financing of SHPs was done through different international institutions and foreign governments like ADB (Asian Development Banks), OPEC fund, UNCDF (United National Capital Development Fund), Switzerland, Austria and Yugoslavia. But most of the SHPs located in the remote part of the country could not even the operation and maintenance cost that prompted leasing of eleven SHPs to interested private entrepreneurs.

(III) Medium Hydropower Projects

All major hydropower interconnected to the National grid system fall in this category. The main objective of medium hydropower projects in Nepal is to satisfy the in house demand for power and energy, primarily in those areas connected by the National grid system.

Although studies of large hydropower projects and construction of medium size projects such as Marsyangdi hydropower project were handled by the ministry of water resources in the past, the NEA now is solely responsible for planning, construction, operation and maintenance of the power sub-sectors.
Kaligandaki "A" hydropower project of 144MW was completed by NEA. At present middle Marsyangdi hydropower project 70MW, Chamelia hydropower project 30MW and Kulekhani III hydropower project 14MW were constructed by NEA. Private sector also in engaged in the development of medium size hydropower development after concluding PPA (power purchase agreement) with NEA. Private sector construct Khimti 60MW, Bhotakoshi 36MW, Chilime 20MW and Jhimruk 12MW medium size hydropower projects. Operating and maintenance of existing plants, distribution of

generated power, development of Transmission system and study on medium sized and small hydropower projects are being executed by NEA.

(IV) Large Hydropower Projects

Nepal's power system at present is incapable to absorb electric energy from large hydropower projects. This type of projects can be considered only for the purpose of exporting electricity to neighboring countries India & China. Exporting electricity to China is a bit difficult due to unfavorable topographical condition of Himalayan. India is only a viable option for export of electricity in the present context. Unless an agreement can be reached between Nepal and India to share benefits, such as expensive electricity, regulation of water for irrigation, flood control and navigation, there will be no potential for implementing these projects. Efforts are underway and official discourses are taking place regularly. But due to complex issues that are related with the whole gamut of water resources development, desirable result are not emerging as aspired by the people of both the countries.

The ministry of water resources has been conducting feasibility studies and field investigation for two large multipurpose projects, the Karnali multipurpose project (6480MW). Other big project west Seti (750MW) and Upper Karnali (300MW) are in process of development by private sector. Upper Tamakoshi (309MW) will be construct by NEA self.

In 1974 a memorandum of understanding (MOU) had been signed between Government of Nepal and Snowy mountain corporation of Australia to developed west Seti project and recently another MOU have been signed between NEA and Elysee Frantire Trust of France to develop Upper Karnali Project jointly. The purpose of these projects except upper Karnali is to export electricity to neighboring countries, especially India. Some portion of generated power may fulfill long term national demand for power and energy.

2.3 Nepal Electricity Authority : A Profile

Though Nepal lacks in minerals like coal, gas, petroleum in abundant quantity, it is considered to be rich in many other natural resources. One of them is huge water resource with vast hydropower potential. Hydropower is renewable energy, environment friendly and is regarded as one of the cheapest form of energy. Nepal can change its fortune by harnessing the water resource to the benefit or agriculture, industry, services and exporting electricity to its neighbouring countries. The topographical and hydrological characteristics make Nepal very rich in hydropower. The estimated theoretical potential based on average flow of the river is about 83,000MW. But so far only 614.979MW have been exploited, which is less than 1 percent of the capacity.

High level of economic development, which is desired by all developing countries, begins with the development of industrial sector. Development of industrial sector depends on the development of power sector. From the study of GDP between the developed and developing nations, we find that the contribution of industry is very high in the developed nations in compare to that of developing countries where the contribution in agriculture is

very high. Further the per capita electricity consumption in developed countries is very high because of industrialization which can also be taken as very good indicator of development.

All are aware about electrification of very district being basic necessity for national development and it also cannot be forgotten that Nepal is faced by extreme hardness due to extreme diversity of landscape, no matter how small it is containing mixture type of climate from very hot climate of terrain to coolest climate as that of Himalayan. Being the mountainous country, Nepal comprises nature for continuous cyclical flow of many rivers, which give more water potentiality that can be used for generation. Hence no one is against the fact that hydro generation is the basic source for national development. Electricity is considered as an infrastructure for almost all kind of industry. Development of hydropower also serves irrigation and flood control needs. Countries like Nepal can benefit most by harnessing water resource and uplift economic standards.

Nepal's hydropower history began in 1911 AD with the construction of first powerhouse. "The Pharping Hydropower Station". Pharping alone generated enough electricity to feed the people of Kathmandu for more that two decades. Sundarijal (640KW). Sikharbas (1600KW) were also developed in the Rang regime.

Nepal Electricity Authority (NEA) is the largest government enterprises in Nepal with the country's highest capital investment, assets and human resources. It has undertaken the overall responsibility for planning, construction, operation and generation of electricity in the nation. Nepal Electricity Authority was established to provide electricity and power generated services in the year 1985 under the Nepal Electricity Act 1984 by the amalgamation of Electricity Department, Electricity Corporation and Electricity development board. Nepal Electricity Corporation and related Development Boards in order to make effective and independent institution, to generate economy production, transmission and distribution of electricity and to manage properly the electricity supply to the nation. To remedy the inherent weakness associated with there fragmented electricity organization with overlapping and duplication works, merger of there individual organization became necessary to achieve efficiency and reliable services.

The primary objective of NEA is to generate, transmit and distribute adequate, reliable and affordable power by planning, construction, operating and maintaining all generation, transmission and distribution facilities in Nepal's power system both interconnected and isolated.

2.4 Development Stages of Nepal Electricity Authority

For the simplicity of the study, the historical development of Nepal Electricity Authority (NEA) can be categorized into three stages.

A. Initial Stage Prior to 2013 BS

The history of hydropower in Nepal begins with the Pharping Hydropower plant 500KW built way back in 1964 BS. The second hydropower project of 900KW capacity (now 640KW) was installed at Sundarijal in 1991 BS. The third Morang Hydro Electric Supply Company of 977KW capacity was established at Letang in 1996 BS for Biratnagar. Prior to the first five-year planning, the total hydropower capacity of 2077KW was supposed to be installed.

B. Mid Stage (2013 to 2027 BS)

The main achievement of the first period (ie. 2013 BS to 2018 BS) was the agreement for the completion of Panauti (Rosi Khola) hydropower on the assistance of USSR and Trisuli Hydropower on the assistance of India. In the second three year plan from 2019 BS to 2022 BS, the total electricity production target was 30,000KW including hydro and diesel power plant. But it was able to produce only 7600KW additional electricity. Panauti hydropower of 2400KW was completed in 2022 BS. Similarly, in the third year of mid stage i.e. Five-year plan from 2022 BS to 2027 BS, the total electricity production target was 60,000KW with actual production of 19,000KW including electricity and diesel power plant. During this period, Trisuli-I (9000KW), Phewa (1080KW) hydropower project was started.

C. Modern Era (After 2028 BS)

During the fourth five-year plan i.e. from 2028 BS to 2032 BS, total 29,090KW capacity of hydropower plant was completed by Trisuli-II (12,000KW), Koshi (6800KW), Sunkoshi (10050KW), Dhankuta (2040KW) hydropower plant. At the end of fourth five-year plan, total hydropower production capacity reached to 42,978KW.

In the fifth five-year plan (2033 to 2037 BS), total 1414KW capacity of hydropower electricity was generated by Tinau (1024KW), Surkhet Jhupra (345KW), Gajuri (25KW), Thansing (20KW) and 10,000KW of Hetauda diesel plant was also established. Similarly, in the sixth five-year plan, total 19,864KW of additional hydropower project were completed with the starting of Gandak (15,000KW), Kulekhani_I (60,000KW), Devghat (14,100KW), Seti Pokhara (1500KW), Doti (200KW), Phidim (240KW), Baglung (200KW), Dhading (32KW), Gorkhe Ilam (64KW) Jomsom (240KW), Jumla (200KW) and Shyangja (80KW) hydropower project.

During the seventy five year plan i.e. from 2042 to 2047 BS, additional 10,3450KW of hydropower electricity was generated in existing capacity by completion of Kulekhani-II (32,000KW), Marshyangdi (6900KW), Selleri (400KW), Darchula (50KW), Chame (45KW), Terhathum (100KW), Helambu (50KW), Manang (80KW), Sharpudaha Rukum (200KW), Chaurjahari Rukum (150KW), Bajhang (200KW), Taplejung (125KW), Khandbari (250KW), Bhojpur (250KW), Okhaldunga (125KW), Ramechhap (75KW), Bajura (200KW), Arughat (150KW). In the silent plan year of 2048 to 2049 BS total additional 33,000KW of hydropower electricity in existing capacity was completed with Tatopani-I (1000KW), Namche (600KW), Suranaiya Gaun (200KW), Rupalgad (100KW), Andhikhola (5100KW), Dunabi multifuel power plant project (26,000KW).

In the eight five year plant from 2049 to 2054 BS additional 17,400KW of hydropower electricity was generated in existing capacity by completing Jhimaruk (12,500KW), Tatopani-II (1000KW), Achham (400KW) and Chatara (3500KW). Similarly, in the ninth five year plan additional 213810KW of hydropower electricity was generated existing capacity by Puwakhola (6200KW), Modikhola (14,000KW), Kaligandaki (96,000KW) (Two units complete) and other small 1610KW. At that five year plan there are tow major private hydropower are completed. They are Khimti (60,000KW) and Bhotakoshi (36,000KW). Other small hydro Sangakhola (183KW), Indrawati (75KW) are also completed by private sector.

Similarly, current Tenth five year plan one unit of Kaligandaki (48,000KW) was completed. Other hydropower Chilime (20,000KW), Piluwakhola (3000KW), Chakukhola (1300KW), Sunkoshi small (2500KW), Rairang (500KW) and Khudi 3450KW) are completed by private sector. At the end of 2063 BS. There was 614979KW power generated including Thermal power. Total No of customer is near about 13,00,000 and the Total electricity services was 35% of Total population.

D. Present Performance

NEA presently serves 13,00,000 consumers across all the 75 district of the country. Although the population benefited by electricity supply remained around a figure of 35 percent. NEA's sub-transmission and distribution infrastructure could cover double the figure if NEA had the financial amenities, the generation capacity and demand from the consumers. Supply of electricity is provided through Thirteen medium-sized and forty-six small hydropower projects. Besides the hydropower projects. NEA operates three diesel and one multi-fuel thermal power plants. In terms of installed capacity, hydroelectric power accounts for 559.951MW and thermal power, 55.028MW. In addition, approximately 50MW of power is imported from India through an inter-governmental Power Exchange Agreement using 132kV, 33kV and 11kV lines as exchange links. This exchange quantum is expected to be enhanced to a level of 150MW through on-going inter-government negotiations. Although the country has a total of 559.951 installed hydropower capacity, only 455.24MW power can be generated during the winter season when the power demand is at its peak. An overview of existing power plants, which from part of NEA's integrated grid, is presented in the annex.

2.5 Review of Related Books

Underlying principles and international practices are found in different books. Entire book is the collection of principles and practices in different circumstances and contexts. The balance sheet and income statement of a business shows the financial position at a given point of time and summary of revenue and expenses during the accounting period. In financial analysis leverage represents the influences of one variable over some other related variable. The cost of different sources of finance is also different. The sources of finance are descried as fixed and variable. The first type of represents that source with carry a filed rate of return such as debt capital. And the next is such as sources which do not carry a fixed rate of return such as equity capital. The returns on equity capital are variable. Ratio analysis is a technique of analysis and interpretation of financial statement. To evaluate the performances of an organization by creating the ratios from the figures of different accounts consisting in balance sheet and income statement is know as Ratio Analysis.

According to R.M. Dangol, in his book Management Accounting, Bhotahity Kathmandu, Taleju Prakasan (1995), the ratio analysis is very helpful in financial forecasting and planning. The ratio calculation of past years works as a guide for future. From the information provided by ratio analysis with the help of financial statement are very useful for making decision on any financial activity.

If management is to maximize the firm's value, it must take advantage of the firm's strength and correct its weakness. Financial statement analysis involves a comparison of the firm's performance with that of other firms industry. This helps management identify deficiencies and then take actions to improve performance.

As per Weston and Copeland, financial structure refers to the way the firm's assets are financed. It is represented by the entire right hand side of the balance sheet that includes short-term debt as well as shareholder's equity. Capital structure or the capitalization of the firms is the permanent financing- a part of financial structure- represented by long-term debt, preferred stock, and shareholder's equity.

Every firm must deal with the various choices available to management for funding the investment and operation of the business over the long-term. Financing section of business includes the operating profit, which normally is a key source of funds available internally for a company. Asset structure of the firm directly influences the financing. The firm having long-lived fixed assets and having much assured demand for its output use long-term debt extensively. Firms that have their assets mostly in receivables and in inventory, as in wholesale and retail trade rely less on long-term debt.
According to Weston and Brigham, Financial statements report both on a firm's position at a point in time and on its operation over some past period. However, the real value of financial statements lies in the fact that they can be used to help predict the firm's future earnings and dividends. From an investor's standpoint, predicting the future is what financial statement analysis is all about, while from management's standpoint, financial statement analysis is useful both as a way to anticipate future conditions and more important, as a starting point for planning actions that will influence the future course of events.

2.6 Review of Related Articles

Analytical studies of an enterprise pertaining to the financial position are essential to know their profit potentiality, operative efficiency and decision-making technique. In our country as well, the financial experts and other analysts have made some research towards financial position of different corporations by using various analytical tools. Some of the available research studies relating to the financial aspects of PEs in Nepal have been reviewed.

The research on "Performance of PEs" in Nepal jointly conducted by ISS and CCC as a part of the research project entitled "Performance of PE in Asia" jointly sponsored by International Development Research Center, Ottawa, Canada and Government of Nepal made in mid (1975), is the first comprehensive research work in public enterprises in Nepal. In the study it was found that the main criteria for providing financial assistance by Government of Nepal was not based on normal corporate portfolio structure and needs, but on crisis policy of adequate working capita had been instrumental in bringing about a circular consolation of property in many PEs. Absence of sufficient equity cushions has led to the poor performance of many PEs.

R.J. Hugus has presented on important report titled "Towards A Power Sector Strategy", Government of Nepal, MOWR, WEO (1980), that the existing power in Nepal is small, fragment and unable to meet the existing demand of electricity. It also pointed out that the lack of an abundant power supply aggravates the energy problems that are characterized by a high usage of fuel wood and disappearance of forest cover, and by a growing dependency on imported hydrocarbons which is exerting pressure in the country's balance of payment situation. Development of hydroelectricity resources could mitigate the energy problems, contribute to industrial expansion and increase export by direct sales of energy or by selective development for energy-intensive industries. While there is obvious need to develop hydroelectric resources there is a number of constraints. The main constrained are high capital investment required relative to resources available. Other constraints are lack of information for evaluation of alternative courses, which could be-followed in hydropower development.

The book of Mr. Arjun P. Shrestha on "Hydro Power in Nepal: Issues and Concept of Development" resources Nepal (1991), has expressed that the major achievements in the economic development of Nepal could be realized through proper harvesting of the vast water resources. But a nearly 100 percent dependency on overseas professionals and a failure to gradually develop our own manpower prevents realization of this goal. The opportunities in hydropower development do not connote nearly approving new projects but also commitment to maintaining and optimizing the efficiency of existing hydropower plants. Such opportunities means institutional development in Nepal would be to open the door for privatization, where there would be a chance for development through competitor and decrease of bureaucratic control. As the development of hydropower in Nepal has always been dictated by many constraints and Conditions, projects are selected by planning procedures, which is deliberately designed to produce a "no option" situation in decision-making.

According to Mr. Surya Nath Bastola in "Water Resources Development of the highly Mighty Himalayan Rivers",Lalita prienters pvt. ltd.(1992), geographical and geological conditions of the country have given rise to such a river system in country. It surveys that some of the cheapest hydropower stations in the world can be developed in the country. Revealed by the up to date study, 15 million KW of hydropower potentiality is much greater compared to our power Market, external inputs for industry, traction, rural electrification etc.

In "Nepal Hydro Power Strategy and Options", prepared for Govn of Nepal b US agency for international development (1992),the main points are that although the country is well endowed with great bio-mass and hydropower resources, recently the place of industrialization has been severely constrained by the lack of energy and power. Unless the power constraints are moved, much industrial growth cannot be achieved, even agricultural growth likely to be constrained due to the lack of energy for lift, irrigation and processing of agricultural commodities.

The management consultant company conducted a study on the performance of PEs of Nepal published in (1994). In the study it was concluded that the assets management in general, and current assets management in particular were the weakest points in Nepalese PEs. The report also pointed out that because of the lack or operational objection, application of the long run planning, use of modern management tools, capital budgeting and efforts towards cost control had been made so far.

In "Energy Sector Perspectives" Dr. Bhekh B. Thapa and Bharat B. Pradhan, Delhi, Konera publishers (1995), says that hydro-power is Nepal's major resource endowment- numerous attractive run-off river and multipurpose hydro schemes have been identified but remain undeveloped, small and micro hydro-potential remains virtually unused in the hill and mountain areas and despite Nepal's small sized, only about 10.5% of the population have access to electricity supply, where as about 40$ of domestic connections are concentrated in the Kathmandu valley.

The Auditors report, presented by Gov/N Auditor General office (2001), mentioned that the irregularity in the payment of advances is increasing in case of WSSC. There is no effective financial control within the corporation and there is no effective provision and control in respect to water tariff and new top connection. The report pointed out that there seems violation of rules and regulations in the acquisition of fixed assets and other goods. More over the report pointed out that there is no proper utilization of machines and other fixed asset and purchase of goods is made only for the purpose of purchase.

Similarly, the Auditor's report concerning Nepal Electricity Authority (2004), mentioned that the economic condition of Authority had been seen unfavorable in view of the economic increase in corporation's liability due to merging of Electricity Corporation into Electricity Authority and not maintaining the provisions that had to be maintained regularly past years. There was no detail information of fixed assets and due to the lack of control in inventory and purchase the real position of corporation could not be identified. The report also pointed out that there was more amounts locked in debtors as the corporation was not successful in recovering electricity tariff which had an adverse effect in the corporation's financial position and this also increased the risk for creation of higher doubtful debt.

In the analysis of capital structure in selected PEs. Dr. Manohar Krishna Shrestha, The Nepalese Journal of Public Administration 42th issue, found that NEA and WSSB are not escaping form public criticism for not providing satisfactory services. The capitalization rate of the selected PEs was less that satisfactory and only few recorded positive EBT. The study also pointed out that there was no proper consistency maintained between EBT and the overall capitalization rate.

Arjun Kumar Karki, Managing Director of NEA, Nepal electricity Authority, fiscal year 2005/2006. A year in review has presented the financial performance. NEA's financial position continued to slump despite the various measure of control taken during the fiscal year and remains seriously challenged in terms of recovery. The past financial year did not see any change in the security situation prevailing in the country for the first ten months of the year. This situation of insecurity prevailing in the country further slowed down the economic activities, seriously affecting the manufacturing and tourism industries. The Tourism sector, a significant contributor to the revenue in the commercial category, failed to revere which diapered NEA's hopes of picking up in revenue generation. This was reflected in the electricity sales in the industrial and commercial sectors. Farther the rising energy purchase rate of the IPPS due to the escalation factor contributed a great deal to the increase in expenditures. The fear of insecurity looming large in the rural areas made meter reading extremely difficult, which resulted in poor revenue collection, meter reading is some 100 thousand households could not be carried out due to the adverse security situation. However, the overall financial indicators in many other areas have exhibited signs of improvement. The increase in the number of customers and the subsequent increase in revenue contributed by the internal sales rare signs of some relief even though the expected sales fell short of expectation.

2.7 Review of Related Thesis

The dissertation submitted by Mr. Sudeep Bahadur Shrestha on the topic "Financing Power Development in Nepal. A Case Study of NEA" (1996), points out that the power is a capital intensive sector for country like Nepal but there was no clear-cut policy for its development and its financing prior to the era of planned development. The trend of financing in power development shows that the Nepalese government only covers about 15 to 25 percent of the total investment where as 75 to 85 percent of investment is covered by foreign aid. The share of international loan is greater that the grant. The study also says that the main issues of financing in power development in Nepal are the shortage of capital, dependency on foreign aid, constraints in exporting power, risk of investment etc. Frequent changes in the government policies and inadequate legal provision, geographical complexity, lack of trained manpower and modern technology are other constraints. According to the study, observing the power deficiency problem, it can be said that there is market within the country. But while analyzing the country's market with respect to the economically feasible power potentiality and with the large scale projects, the scarcity of the sizable market is in front.

A study on the "Profit Planning in Nepal Electricity Authority" conducted by Mr. Gunakar Bhatta (1998), explains that the authority fails to maintain its periodic performance report systematically. The study says that the NEA is suffering from high fixed costs and is suffering from high rate power loss, sales is below than production in the range of 20 to 25 percent during the study period. It also shows that the authority lack of proper coordination between various responsible departments and the top-level executives are only involved in planning and decision-making, lower level participation is not encouraged. The study points out that NEA is unable to maintain budget discipline particularly in overhead like as staff cost and administrative expenses. Increasing cost in each fiscal year is another remarkable point for NEA. Overhead is not classified systematically and it creates problem to analyze its expenses properly. The authority fails to analyze its strength and weakness in depth.

The thesis conducted by Mr. Deepak Khanal on "A study on Capital Structure of Industrial Public enterprises" (1999), have selected samples from industrial public enterprises of Nepal and used financial ratio and correlation analysis as the tool of analysis. He concluded that the capital investment and earnings were not correlated. Most of the public enterprises were in loss position. He suggested that the management should improve their performance efficiency. [28]

The thesis report submitted by Mr. Nabhendra Poudel on "Financial performance of Nepal Electricity Authority" (2002), says there is no effective utilization of assets in NEA. It has been seriously facing the problem of outstanding debt collection. From the overall analysis, NEA has generated very low returns. Increasing cost in each fiscal year is an important issue of NEA. It has adopted the cost control tools and techniques.

The thesis report submitted by Mrs. Eliza Amatya on "The financial performance of NEA" (2005), says that, Nepal Electricity Authority was not efficiently utilized it's Assets NEA has facing the problem of outstanding debt collection. The all ant receivable of NEA is very

high. NEA generates negative profitability through the study period. There is no effective cost control mechanism in NEA because cost is increase every year. Electricity leakage, theft and wastage have been the major reasons behind reducing the profit earning capacity of NEA.

Research Gap:

Nepal Electricity Authority is one of the largest enterprises in Nepal. It is a capital-intensive institution and cannot implement its own investment plan with its internal resources. Its financial position has a significant impact upon the electricity generation in Nepal. As a firm it should generate profits, however, being a public-utility-concerned, it should be service oriented as well. Besides, NEA should earn some surplus for the sake of repairing and maintenance. There should be trade-off between cost and service.

Analysis of financial statement is a crucial part of financial decision-making process of a business enterprise. Poor financial management affects adversely on liquidity, turnover and profitability. It is required to measure the financial position of the enterprise periodically in order to ensure smooth functioning of an enterprise. Nepal Electricity Authority is an enterprise of great national concern. Thus, this study is made to evaluate the financial position of NEA. This study will be useful to provide information and to draw the attention of NEA managements regarding what can be done for reduction of losses and operating expenses further strengthening the financial position of NEA. This study is expected to be helpful to the private and non-governmental agencies, which are willing to invest in hydropower projects in Nepal. This study is believed to be an important effort to identify losses reduction efforts and operating expenses reduction. It also finds out an actual trend of financial position of NEA and is expected to provide some appropriate measure to solve financial problems of NEA.

Chapter-III

RESEARCH METHODOLOGY

3.1 Introduction

The main objective of this study is to find out the true financial picture of NEA. Financial analysis is the process of identifying the financial strengths and weakness of the firm by properly establishing relationship between capital and assets of the organization. Financial analysis plays an important role in finding the real picture of financial performance of any organization. It provides an idea to the management while adopting the financial policies.

The study requires an appropriate research methodology so as to achieve its certain goal. There are many variable in the study of NEA. This chapter looks into the research design, nature and sources of data, data gathering procedure, tools of analysis. A suitable and simple research methodology of the study is followed so as to fulfill the stated objectives as well as to make it easier in visualizing the total study clearly. This chapter includes research design, sources of data, hypothesis and tools used for the analysis.

3.2 Research Design

Research Design is the plan structure and strategy of investigation conceived so as to obtain answer to research questions. The research is based on recent historical data. The study will explore the profitability of NEA. The profitability refers to the amount of earning before interest in the specific time period. To conduct the study both descriptive and analytical research approach has been adopted. Descriptive approach is utilized for conceptualization, problem identification, conclusion and suggestion of the study where as analytical approach will be followed for the presentation and analysis of data. Thus the study is analytical as well as exploratory in nature. The data have been analyzed on the basis of standard financial formulas used in the book of financial management.

3.3 Types and Sources of Data

The main source of date for the purpose of this study is the published financial statements of NEA. The study is based on the Primary data and secondary data. It constitutes mostly the annual reports, which comprises balance sheet and income statement. Information has also been supplemented from various publication of NEA. Though the study basically covers the secondary data, however, in some cases primary data were also obtained from discussion with the officials of NEA. All other available published and unpublished materials concerning the study as well as some journal abstracts will also be used in the study. The data has been processed through editing, coding and classification of the collected data. Presented data have been analyzed using various analytical using as well as descriptive financial and statistical tools. The reliability of the study and its findings depends upon the available secondary data.

3.4 Method of Analysis

In order to make an analysis of available data, following methods have been employed.

a. Various books, journals, publications, and other related literatures were studied as the first step to begin the study.

b. In order to process the data, first of all financial statements and other economic data were reviewed. They were grouped into various tables and charts, according to their nature. After that condensed balance sheet and income statement were prepared.

c. On the basis of obtained financial statement, balance sheet and profit and loss accounts, different tables were prepared and presented as required.

d. From the collected data leverage and ratios were analyzed.

e. With the help of analysis, conclusions were drawn and recommendations were suggested.

3.5 Leverage

In general, leverage represents influence or power. It is a term taken from engineering sciences. It indicates mechanical advantages of effectiveness gained by the action of a lever. In financial analysis leverage represents the influence of one variable over some other related variable.

A firm can make use of different sources of financing. The cost of or these different sources are also different. These sources can be classified mainly into two types. The first type represents those sources with carry a fixed rate of return such as debt capital. And the next is such as sources which do not carry a fixed rate of return such as equity capital the return on equity capital are variable.

The fixed return source of finance will affect variable return sources. The return on the equity shareholder is affected by the debt capital. Out of the earning of a company. If the firm has to pay a huge amount for debt capital and preferred capital. Which is fixed in nature, only the remaining portion would be receivable for the equity shareholder. Instead of it, if there is no any such a debt or preferred capital in a company then all the earning would be receivable for equity shareholder. Thus the amount receivable by the equity shareholder is affected by debt and preferred capital. In simple way, we can say such an effect is known as leverage.

The term leverage may be defined as the employment of an assets or sources of funds for which firm has to pay a fixed cost or fixed return.

Types of leverage:

There are three leverage, those are:

i) Operating leverage
ii) Financial leverage
iii) Combined leverage

i) Operating leverage:

The relationship between the rate of change that takes place in sales and the resulting rate of change in net operating income is known as operating leverage. Operating leverage results from the existence of fixed operating expenses in the firm's income statement. A firm has a high degree of operating leverage if it is using higher percentage of fixed cost out of the total cost.

The business forms have two options: (a) to operate with high fixed cost or (b) to operate with high variable cost. In first option the risk is very high and as a result profitability will also be high, in second option, the risk will be low and the Profitability will also be low. For find out the operating leverage of a business, the following formulas are using.

$$\text{Degree of operating leverage (DOL)} = \frac{\text{Sales- Veritable cost}}{\text{Earning before interest and tax}}$$

$$\text{DOL} = \frac{\%\text{charge is EBIT}}{\%\text{Charge in Sales}}$$

(ii) Financial leverage:

The impact of debt financing on the earning before Tax (EBT) of the firm is financial on the leverage. Financial leverage is the use of another persons money in return for a fixed payment and promise to return money. In a firm borrows funds, It issues debt and must make attired payment for the use of the money. The fitted payment is called interest. The debt must be retired.

In total capitalization of the company if the proportion of burrowed fund is high then the financial leverage will also be very high. In there is no any borrowed capital and all operation assets are financing by owners equity. In that case the degree of financial leave rag (Dfl) will be one the degree of financial leverage is calculated by using following formula

$$\text{Degree of financial leverage (dfl)} = \frac{\text{Earning Before Interest and Tax}}{\text{Earning before tax}}$$

Or,

$$\text{Dfl} = \frac{\%\text{change in earning before tax}}{\%\text{Change in earning before interest and tax}}$$

(iii) Combined leverage:

The combination of operating leveraged and financial leverage is known as combined leverages. The leverages are combined to assess the impact of all

types of fired casts. It can be find out by multiplying decree of operating leverage with degree of financial leverage. Degree of combined leverage is calm late using the following formulas.

Decree of combined leverage (dcl) =Dol x Dfl.

Or,

$$(Dcl) = \frac{\text{sales- Ueriable cost}}{\text{EBIT}} \times \frac{\text{EBIT}}{\text{EBT}} = \frac{\text{CM}}{\text{EBT}}$$

Or,

$$Dcl = \frac{\%\text{change on EBT}}{\%\text{change on sales}}$$

3.6 Tools for Analysis

For the sake of analysis, various financial and statistical tools are used. The major tools employed for the analysis of this study are leverage and ratio analysis. Leverage represents the influence of one variable over some other related variable ratio analysis establishes the quantitative or numerical relationship of two variables of the financial statements. Ratio Analysis is the basic tools used for the study and is considered to be the powerful tool of financial analysis. Beside ratio analysis, various other financial tools and statistical tools have been used for the study. The financial as well as statistical tools have been studied in brief in the following pages:

3.6.1 Ratio Analysis

Ratio analysis is a widely used tool for financial analysis. Ratio Analysis is a powerful tool and technique of financial analysis, which helps in identifying the sound financial structure of the organization. In other words, ratio analysis helps the analyzer make quantitative judgment of the firm's financial position as well as its performance.

A ratio is defined as the indicated quotient of two mathematical expressions. "Ratio refers to the numerical or quantitative relationship between two items or variables. A ratio is calculated by dividing of the relationship with other"[29]. The primary purpose of ratio is to point out areas of further investigation. Ratio analysis stands for the process of determining and presenting the relationship of items and groups of items in the financial statement. According to James C. Van Horne, "To evaluate the financial condition and performance of a firm, the financial analysis needs certain yardsticks. The yardsticks frequency used is a ratio or index relating to pieces of financial data to each other". Thus ratio analysis is considered to be the yardstick tool to evaluate the financial performance and condition of the firm.

Types of Ratio:

Ratio may be classified in number of ways keeping in view the particular purpose. There are different views about classification of ratio analysis. According to James C. VanHorne, "Different vipers of ratios namely liquefy ratio. Leverage ratio, turnover ration, and profitability ratios, which are essential fir decennial for decision making of capital structure. Following ratios are used to know the financial performance of NEA.

A. Liquidity Ratio.
B. Turnover Ratio
C. Profitability Ratio
D. Leverage/Solvency Ratio

A. Liquidity Ratio

Liquidity ratios are used to judge the firms ability to meet short-term obligations. Short-term liquidity ratio involves the relationship between current assets and current liabilities. Two ratios are mainly used to measure the liquidity position.

1. Current Ratio
2. Quick Ratio/ Acid- Test Ratio

1. Current Ratio:

The Current Ratio is a measure of liquidity calculated by dividing the firms current assets by current liabilities. Current ratio is also known as working capital ratio.

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Current Assets include cash and those assets that can be converted into cash within a year, such as marketable securities, debtors and inventories, prepaid and advance expenses. All obligations maturing within a year are included in current liabilities. Thus a current liability includes creditors, bills payable, accrued expenses, short-term back loan, income tax liability and long- term debt maturing in the current year.

Higher the current ratio, greater is the probability of timely and full payment of current liability. Low ratio indicates that the firm may not be able to pay its future bills. As a conventional rule, a current ratio of 2 considered to be satisfactory or is considered to be a rule of thumb standard.

2. Quick/ Acid Test Ratio:

Quick ratio is the proportion of quick assets to current liabilities, which is more accurate measure of liquidity than the current ratio. This ratio establishes a relationship between quick or liquid assets and current liabilities. An asset is liquid if it can be converted into Cash immediately or reasonably soon without a loss of value. Cash is considered to be most liquid asset. Other liquid asset Includes bills receivable, sundry debtors and short-term investments. Inventories and prepaid expenses are considered to be less liquid as the emphasis is on ready availability of cash. The quick ratio is calculated by dividing the total quick assets by current liabilities.

$$\text{Quick Ratio} = \frac{\text{Quick Assets}}{\text{Current Liabilities}}$$

Quick Assets = Current Assets – Inventories

Quick ratio is considered to be better than current ratio for the test of financial soundness of a firm. Generally, a Quick ratio of 1:1is considered to represent a satisfactory current financial condition. Higher ratio indicates that the firm has excessive quick assets and indicates inefficient management. A low ratio is the indicator of difficulties in the times payment of future bills.

B. Turnover Ratio

Turnover ratio indicates the speed with which assets are being converted or turned over into sales. Turnover ratios involve comparison between the level of sales and investment of various assets. Funds of creditors and owners are invested in various assets to generate sales and profit. The better the management of assets, the larger the amount of sales. The activity ratios are employed to evaluate the efficiency with which firm manages and utilizes its assets. A proper balance between sales and assets generally reflects that assets are managed well. Several activity ratios can be calculated to judge the effectiveness of asset utilization. The turnover ratios on practice are as follows:

1. Fixed Assets Turnover Ratio
2. Total Assets Turnover Ratio
3. Inventory turnover Ratio
4. Average Collection period

1.Fixed Assets Turnover Ratio:

Fixed Assets turnover ratio measures the efficiency with which the firm is utilizing its investment in its various net fixed assets. It is calculated as:

$$\text{Fixed Assets Turnover Ratio} = \frac{\text{sales}}{\text{Net fixed Assets}}$$

Net fixed assets is defined as a gross fixed assets minus depreciation. The ratio express that a rupee of investment in a net fixed asset generates the resulted sales. Generally high fixed asset turnover ratio indicates efficient utilization of fixed asset while inefficiency in utilization is shown is shown by low fixed asset turnover ratio.

2. Total Assets Turnover Ratio:

Total assets turnover ratio indicates the sales generated per rupee of investment in the total assets.

$$\text{Total Assets Turnover Ratio} = \frac{\text{Sales}}{\text{Total Assets}}$$

Total assets constitute the fixed assets as well as current and investment of the firm. Generally, higher turnover ratio shows efficiency in utilization of firm's scarce resources and vice-versa.

3. Inventory Turnover Ratio:

Inventory turnover ratio is defined as sales divided by inventory.

$$\text{Inventory Turnover Ratio} = \frac{\text{Sales}}{\text{Inventory}}$$

Inventory turnover Ratio shows how rapidly the inventor is turning into receivable through sales. Generally, high inventory turnover is the indication of good inventory management. Lower inventory turnover suggests as inefficient inventory management. However, A relatively high inventory turnover causes overly low level of inventory and result frequent stock-out and is costly for the firm.

5. Average Collection Period:

The average collection period provides the average turnover days of receivable and outstanding, the average times it takes to convert them into cash. The average collection period is computed in tow steps.

-Annual sales divided by number of days in a year (360 days) to get the average daily sales.
-Account receivable is divided by daily sales to find out the number of days sales tied-up in receivable.

$$\text{Sales per Day} = \frac{\text{sales}}{\text{Days in a year (360 days)}}$$

$$\text{Average collection period} = \frac{\text{Sales}}{\text{Net Fixed Assets}}$$

Short average collection period shows the timely payment of debt but it may suggest an excessive and restrictive credit policy of firm. Too long average collection period indicates inefficiency of the firm in collection of receivables.

C. Profitability Ratio
Profitability ratio measures the success of the firm in earning a net return on sales or on investment. These ratios give the decision about how effectively the firm is being managed. Profitability ratios can be classified into following major groups:

1. Net Profit Margin
2. Operating Expenses Ratio
3. Return on Total Assets

1. Net Profit Margin:

The net profit margin establishes the relationship between net profit and sales.

$$\text{Net Profit Margin} = \frac{\text{Net profit}}{\text{Sales}}$$

Net profit, here, is defined as firms profit after taxes excluding other charges such as dividend and other provisions. The ratio measures the firm's ability to changes each rupee sales into net profit. In other words, if the net profit margin is inadequate, the firm will fail to achieve satisfactory returns on owner's equity.

2. Operating Expenses Ratio:

Operating expenses ratio is the yardstick of operating efficiency, which can be computed by dividing operating expenses by sales.

$$\text{Operating Expenses Ratio} = \frac{\text{Operating Expense}}{\text{Sales}}$$

Operating expenses constitute administrative and selling expenses excluding interest in general higher operating ratio indicates the inefficiency due to higher operating cost in terms of sales. Lower operating ratio is favorable since it will generate higher operating income, which will be sufficient to meet interest, dividend and other expenses of the firm.

3. Return on Total Assets:

Return on total assets ratio is the proportion of net income after taxes plus interest expenses to total assets (total investment).

$$\text{Return on Total Assets} = \frac{\text{Net income after tax + Interest}}{\text{Total Assets}}$$

It is the rate of return earned by the firm for all its investments including the lenders. Higher return on total assets ratio higher earning of the firm in terms of its total assets. Lower ratio indicates unsound financial position due to level of return.

E. Leverage/ Solvency Ratio

Financial leverage or capital structure ratios are calculated to judge the long- term financial position of the firm. This ratio indicates the mix of fund provided by owners and lenders. The short- term creditors like bankers and suppliers of raw material are more concerned with the firm's current debt paying ability. On the other hand, long- term creditors like debenture holders bondholders etc. are concerned with the firm's long-term financial strength. Infect, affirm should have a strong short as well as long- term financial position. AS a general rule, there should be an appropriate mix of debt and owners equity in financial mix of the firm's assets.

The manner in which assets are financed has a number of implications. Debt is considered to be more risky in compare to equity. The firm has a legal obligation to pay interest to debt holders, irrespective of the profits made of losses incurred by the firm. If the firm fails to pay the debt holders in time, they can take legal action against to get payments and in extreme cases can force the firm into liquidation. On the other hand, employment of debt is advantageous for shareholders in tow ways: they can retain control of the firm with a limited stake and secondly their earning will be magnifying the shareholder return through the employment of debt is called financial leverage. The leverage ratio consists of:

1. Total Debt to Total Assets Ratio
2. Debt-Equity Ratio

1. Total Debt to Total Assets Ratio:
The ratio between total debt and net assets is called total debt ratio. Total debt will include short and long- term borrowings from financial institutions, debentures/ bonds, deferred payment arrangements for buying capital equipments, and back borrowings. Public deposits and other interest - bearing loan.

$$\text{Debt Ratio} = \frac{\text{Total Debt}}{}$$

Total Assets

2. Debt- Equity Ratio:

The ratio between total debt and net worth is called debt- equity ratio.

$$\text{Debt- Equity Ratio} = \frac{\text{Total Debt}}{\text{Net worth}}$$

Statistical Tools

A. Average

An average is the figure representing even distribution among the included elements or terms. It is calculated by dividing the sun of the elements with number of elements.

B. Regression Analysis

Regression analysis provides certain insights into how to plan the data. It establishes the functional relationship between the variables of ones interest. The relationship set up can be gauged and checks can be made on the underlining assumptions.

C. Graph

Graph helps to show the general trend of the ratios in respect to the time period. Avery common and simple way of presenting data for tow variables, which have a relationship, is in figure or chart or a graph. Graph works best when the data is continuous.

Method of presentation and Analysis

Simple methods of analysis have been used. Data presentation and analysis are divided into small Sub-topics. Every result has been tabulated and clear interpretations have been given simultaneously. Details of calculation are presented at the end of the report. Tables diagrams and graphs have been used to make report clear and easily understandable summary conclusion ands recommendations have been presented at the last chapter of the report.

Chapter-IV

ANALYSIS AND INTERPRETATION OF DATA

4.1 Introduction

This chapter highlights the financial condition of NEA. The tools used for the purpose of analysis have been discussed in detail in the research methodology. Some financial and statistical tools have been use to evaluation of financial condition of NEA. The financial tools include leverage and ratio analysis between various variables where as the statistical tools include graphical presentation as well as regression analysis between some of the variables. The major variable like assets, liabilities, sales, debt, and equity are taken for the analysis. Moreover, the variables affecting to the profitability are also considered in the study. The analysis is made through the data presentation and various leverage and financial ratios reflecting the relationship among variables affecting profitability.

With the help of leverage, how the amount receivable by the equity shareholders is affected by debt and preferred stock to be finding out. The term leverage may be defined as the employment of an assets or sources of funds for which the firm has to pay a fixed return.

With the help of ratio analysis, the financial condition of NEA has been analyzed and interpreted so that the strength and weakness of the NEA as well as its historical performance and current financial condition can be determined. In addition, the operational target for the current fiscal year and the impact it will leave in the financial position in coming future can be ascertained.

The single ratio cannot indicate the favorable or unfavorable condition of NEA. It should be compared with some standard for evaluation. Therefore the average ratio from the actual ratios of 10 years period have been calculated and used as a standard. The ratios used have been described as below.

Analysis of Secondary Data

4.2 Leverage

4.2.1 Operating leverage

The relationship between the rate of change that takes place in sales and the resulting rate of change in net operating income is known as operating leverage. Operating leverage result from the existence of fixed operating expenses in the firm's income statement. A firm has a high degree of operating leverage, if it is using higher percentage of fixed cost out of the total cost.

Table-1
Degree of Operating Leverage (Rs. in Million)

Year	Sales	% Change in Sales	EBIT	% Change in EBIT	DOL
1997	4767.30		2061.20		
1998	5082.50	0.066	1611.40	-0.22	-3.33
1999	5396.70	0.062	1388.20	-0.14	-2.26
2000	6756.00	0.27	2217.50	0.59	2.18
2001	8160.80	0.19	894.70	-0.59	-3.10
2002	9476.20	0.16	186.10	-0.79	-4.94
2003	11012.60	0.16	2073.10	10.14	63.37
2004	11874.70	0.078	1850.30	-0.11	-1.41
2005	12605.20	0.062	1986.90	0.074	1.19
2006	13331.90	0.058	1485.90	-0.25	-4.31

Source: Financial statement of NEA

In above calculation degree of operating leverage DOL of NEA is always negative. That means increase of sales not generate profit. In year 2000, 2003 & 2005 the DOL is positive other six year DOL is negative. It indicates that the increasing trend of sales is not generating profit.

4.2.2 Degree of financial leverage

The impact of debt financing on the earning before tax of the firm is financial leverage. If there is no any borrowed capital and all operating assets are financing by owner's capital, in that case the degree of financial leverage is one.

4.2.2 Financial leverage

The impact of debt financing on the earning before Tax (EBT) of the firm is financial on the leverage. Financial leverage is the use of another persons money in return for a fixed payment and promise to return money. In a firm borrows funds, It issues debt and must make attired payment for the use of the money. The fitted payment is called interest. The debt must be retired.

Table-2

Degree of Financial Leverage (Rs. in Million)

Year	EBIT	% Change in EBIT	EBT	% Change in EBT	DFL
1997	2061.20		835.70		
1998	1611.40	-0.22	202.50	-0.76	3.45
1999	1388.20	-0.14	167.60	-0.17	1.21
2000	2217.50	0.59	756.50	3.51	5.95
2001	894.70	-0.59	-1.90	-1.00	1.69
2002	186.10	-0.79	-717.40	376.57	476.67
2003	2073.10	10.14	-455.90	-0.36	-0.035
2004	1850.30	-0.11	-1486.10	2.26	-20.54
2005	1986.90	0.074	-1312.80	-0.012	-0.16
2006	1485.90	-0.25	-1267.80	0.034	-0.13

Source: Financial statement of NEA

The degree of financial leverage of NEA at Ten years period is very flaxuated. Year 1997 to 2002 the DFL is positive. Then the remaining years DFL of NEA is negative. The causes of negative DFL are increase in long-term loan and payable of its interests. It indicates that the profitability of NEA is negative and loss is increasing trend in every year.

4.2.3 combined Leverage

The combination of operating leverage and financial leverage is known as combined leverage. The leverages are combined to assess the impact of all type of fixed cost. The effect of combining operating and financial leverage is a two-step magnification of any change in sales in to large relevant change in earning per share. A quantitative measure of this total sensitivity of a firms earning per share to a change in the Firms sales is called the degree of combined leverage.

Table-3

Degree of Combined Leverage

Year	DOL	DFL	DCL
1997			
1998	-3.33	3.45	-11.48
1999	-2.26	1.21	-2.73
2000	2.18	5.95	12.18
2001	-3.10	1.69	-5.24
2002	-4.94	476.67	-2349.80
2003	63.37	-0.035	-2.22
2004	-1.41	-20.54	28.96
2005	1.19	-0.16	-0.19
2006	-4.31	-0.13	0.56

Source: Financial statement of NEA

Above ten years period of NEA financial statement, the degree of combined leverage is always negative. Increase in sales is not generate profit and highly increase in long-term loan is another causes of negative earning per share of NEA. The earning per share or earning power of investor is not satisfactory.

4.3 Liquidity position

Liquidity ratios are used to judge on organizations ability to meet its short-term obligations. These ratios are comparison of short-term obligation with the resources available and are measured by current ratio and quick ratio. The liquidity ratio reflects the short-term financial strength of a firm.

4.3.1 Current Ratio (CR)

Current ratio measures the liquidity position of the organization. The standard current ratio should be 2:1 and it is also defined by the nature of the organization. As already discussed in chapter three. The current ratio is a measure of liquidity calculated by dividing the firms current assets by current liabilities. The position of current ratio and the values of current assets and current liabilities according to Nepal Electricity Authority balance sheet are tabulated below.

Table –4

Calculation of Current Ratio (Rs. in Million)

Year	Current Assets	Current Liabilities	Current Ratio
1997	4868.60	2925.20	1.66:1
1998	5692.20	4005.00	1.42:1
1999	5053.20	4786.50	1.06:1
2000	5761.10	5477.40	1.05:1
2001	6313.60	6113.70	1.03:1
2002	7322.00	5948.10	1.23:1
2003	7690.50	8198.10	0.94:1
2004	7883.40	10389.20	0.76:1
2005	8491.60	13317.50	0.64:1
2006	8995.30	15705.30	0.57:1

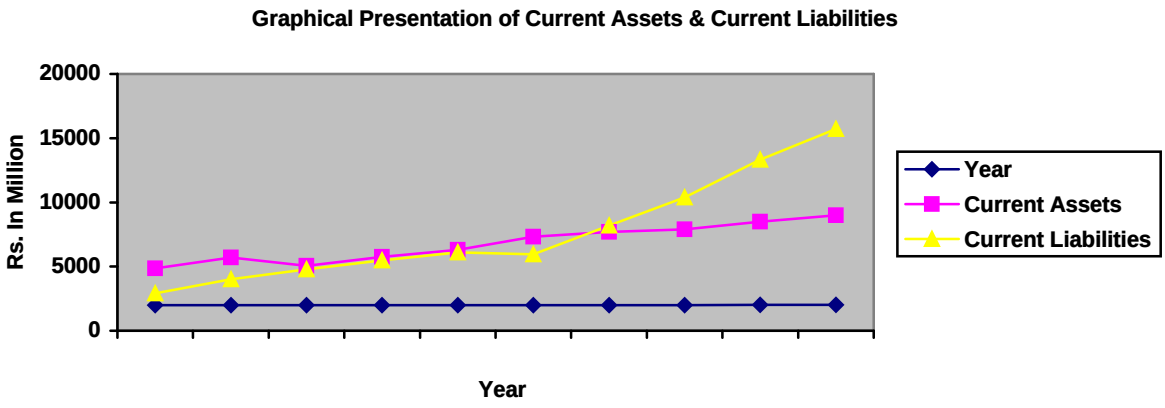
Source: Financial statement of NEA

Looking over the trend of current ratio of NEA over ten years, it can be observed that NEA current ratio is always less then the standard norms 2:1. The current Ratio of NEA is declining trend in every year.

According to above table, the current ratio of NEA has increase from Rs.4868.60 million to Rs.8995.30 million in year 1997 to 2003. Where as current liabilities were varied from Rs.2925.20 to Rs.15705.30 million in the same period.

According to above table, the average current ratio is 0.88 times. The current ratio in the year1997 was recorded 1.66 times; similarly the current ratios were recorded as 1.42,1.06,1.05,1.03,1.23,0.94,0.76,0.64 and 0.57 in the year 1998,1999,2000,2001,2002,2003,2004,2005 and 2006 respectively. All ten years shows that the current ratio is below the average standard of 2:1. Highly increase of current liabilities is the main causes of low current ratio of NEA. This shows that the liquidity position of NEA is not very strong during the periods. It means that NEA was not in the position of meet its current obligations in the appropriate time that the current liabilities could not be covered by current assets.

Graphical presentation of current assets and current liabilities - 1



From the above table it can be seen that the volume of current assets from the year 1997 has been increasing gradually to the year 1998. But it showed slight decline in the year 1999 and from the year 2000 it has been increasing gradually till year 2006. Similarly the amount of current liabilities is increasing gradually from the year 1997 to the year 2001 and decrease in the year 2002. Then the current liabilities are increase highly from year 2003 to the year 2006. in conclusion, the increase in current liabilities of NEA was followed by corresponding increase in current assets from the year 1997 to 2002. But from the year 2003 the current liabilities was highly increase then current assets. The analysis showed that NEA has changed its working capital management policy. There has been change in the current assets depending up on the changes in its production and sales.

It is noticed from the annex no 1 that the coefficient of correlation between current assets and current liabilities is + 1.375 and probable error is –0.281. This suggests that the two variables are positively correlated to each other and that the corporation has followed uniform policy to finance current assets and current liabilities with regards to it overall liquidity position. It can be consider that there is no satisfactory trend of between current assets and current liabilities. That is current assets were not enough to pay off current liabilities.

4.3.2 Quick Ratio (QR)

The quick ratio is more accurate guide to measure the liquidity position of any form. Quick ratios establish a relationship between quick or liquid assets and current liabilities. Liquidity of an asset can be measured by its virtue of immediate conversion in to cash without the loss of value. Cash with in current assets is considered to be most liquid. Marketable securities and bank debt are relatively liquid. Items like prepaid expenses are considered less liquid in comparison to the current assets stated above. So the calculation of quick ratio includes only these assets that are most liquid in nature. Thus the quick asset is calculated by deducting inventory and prepaid expenses from the current assets. Hence quick ratio can be found by dividing the total of quick assets by the total of current liabilities. The quick ratio of NEA is presented in the table below.

Table –5

Calculation of Quick Ratio (Rs. in Million)

Year	Current Assets	Inventory	Prepaid Expenses	Quick Assets	Current Liabilities	Quick Ratio
1997	4868.60	804.00	1329.00	2735.60	2925.20	0.94:1
1998	5692.20	914.90	1709.60	3067.70	4005.00	0.77:1
1999	5053.20	740.00	1634.20	2679.00	4786.50	0.56:1
2000	5761.10	982.30	1932.00	2846.80	5477.40	0.52:1
2001	6313.60	960.90	2634.90	2717.80	6113.70	0.44:1
2002	7322.00	1058.10	3314.40	2949.50	5948.10	0.50:1
2003	7690.50	1017.20	2216.90	4456.40	8198.10	0.54:1
2004	7883.40	1048.00	2063.30	4772.10	10389.20	0.46:1
2005	8491.60	1372.70	2098.60	5020.30	13317.50	0.38:1
2006	8995.30	1354.80	2293.90	4946.60	15705.30	0.32:1

Source: Financial statement of NEA

Quick ratio measures the liquidity position of the organization and the standard quick ratio should be 1:1.Which is also defined by the nature of organization. The quick ratio shows the ability for payment of immediate current debt from current assets. According to above table, the quick ratio is declining trend from the year 1997 to 2001. Then it slightly increases from the year 2002 to 2003. Then also it can decline to the year 2006. The average quick ratio of this ten years study period of NEA is 0.47, which could not be yet considered as satisfactory ratio. Thus NEA is not in satisfactory position in meeting its current obligations.

Quick assets increased from Rs.2735.60 million to Rs.4946.60 million from the year 1997 to the year 2006. Similarly, it reached to Rs.3067.70 million in the year 1998, 2679 million in year 1999, 2846.80million in the year 1999, 2846.80 million in year 2000, 2717.80 million in year 2001, 2949.50 million in the year 2002, 4456.40 million in the year 2003, 4772.10 million in the year 2004 and 5020.30 million in 2005 year. But the increasing tendency in current liabilities is more then increasing tendency of quick assets.

Due to the fluctuating position of inventory, there is a proportionate decrease in the quick assets that ultimately resulted in the declining position of quick ratio. The quick ratio from the year 2002 to the year 2003 seem to be slightly increasing as compare to the prior year but still the ratio could not satisfy the liquidity position of NEA as it could not yet reach the position as in the beginning. There was not much difference between the trend of quick ratio and current ratio. If inventories were not unnecessarily tied up in the working capital of NEA, the case would have been different. But in comparison between the current ratio and the quick ratio, the position of quick ratio can be considered better.

4.4 Turn Over Ratio

How efficiently the assets are utilized can be judged by using different types of turnover ratio. In the case of NEA, evaluation of fixed assets turnover ratio, total assets turnover, debtors turn over and average collection period was made to judge the utilization of assets.

4.4.1 Fixed Assets Turnover Ratio (FATOR)

Fixed assets turnover ratio measures the efficiency with which the firm is utilizing its investment in its various net fixed assets. The ratio expressed that a rupee of investment in a net fixed assets generates the resulted sale. Generally high fixed assets turnover ratio indicates efficient utilization of fixed assets while inefficiency in utilization is shown by low fixed turnover ratio. The FATOR of NEA has been calculated by taking revenue from sales and total fixed assets as in the following table to know how effectively the fixed assets are being utilized in NEA.

Table - 6

Calculation of Fixed Assets Turnover Ratio (Rs. in Million)

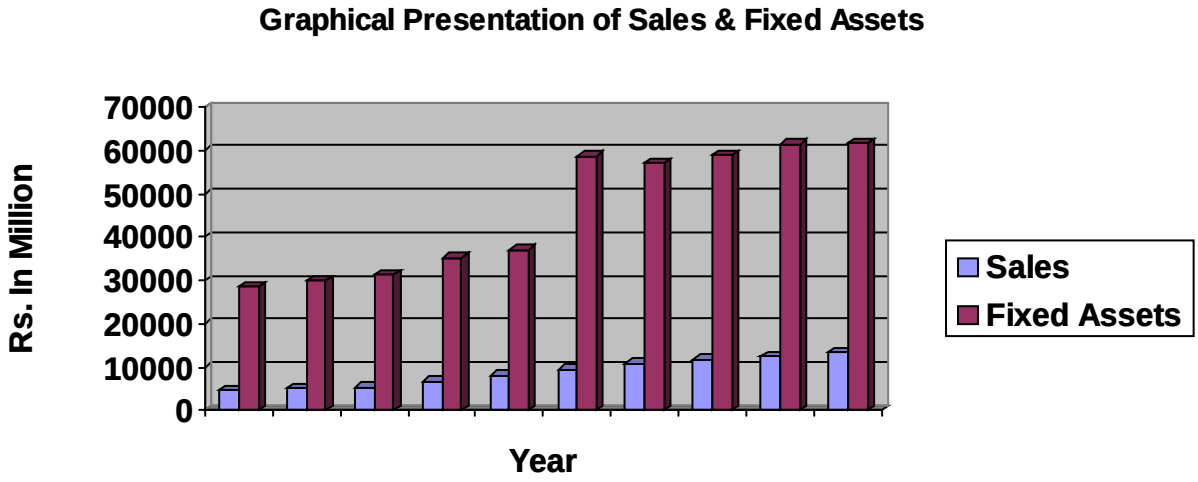
Year	Sales	Fixed Assets	FATOR
1997	4767.30	28633.40	0.17
1998	5082.50	29891.30	0.17
1999	5396.70	31222.80	0.17
2000	6856.00	35195.70	0.19
2001	8160.80	37103.70	0.22
2002	9476.20	58538.20	0.16
2003	11012.60	56949.00	0.19
2004	11874.80	58963.40	0.20
2005	12605.20	61286.80	0.21
2006	13331.90	61573.00	0.22

Source: Financial statement of NEA

The fixed assets turnover ratio is calculated by dividing sales by total fixed assets. According to the above table no –6, the net sales of electricity of NEA has continuously increased during the study period. It varied from Rs.4767.30 million to Rs.13331.90 million from the year 1997 to the year 2006.

Along with the increase in net sales, the fixed assets of NEA have also increased as the same time. It varied from Rs.28633.40 million to Rs.61573.00 million from the year 1997 to the year 2006. NEA has been expanding its service throughout the country for which it requires additional fixed assets like land and building, plant and machinery, solar power plants, transmission line, substation etc. thus the fixed assets of NEA have been increased every year with additional power plant and generation capacity. However the study from above table shows the poor utilization of fixed assets with in the organization. The average FATOR is 0.19 only. This indicates the FATOR and poor utilization of fixed assets. One of the causes of poor utilization of fixed assets may be the asset remaining idle without any use.

Graphical presentation of sales and fixed assets -2



The bar chart of sales and fixed assets above shows that the sales of NEA are increasing gradually in compare to fixed assets. The fixed assets of NEA decline in year 2002 to the year 2003. After which it incline gradually till year 2006.

In conclusion, though the sales is gradually increasing in respect of fixed assets. Fixed assets turnover ratio of 0.19 is not a satisfactory turnover. The fixed asset comprises almost 90 percent of total assets of NEA and these assets are supposed to provide revenue to the firm. The poor assets turnover was the cause of inefficient utilization of these assets and there has been high investment in the unproductive fixed assets like land, building, vehicles etc. The low sales of electricity is the result of electricity leakage, low sales to the industrial sectors etc. though the study shows the gradual improvement in the FATOR to meet its objectives and goals, NEA should look for the effective utilization of available resources.

4.4.2 Total Assets Turnover Ratio

Total assets turnover ratio indicates the sales generated per rupee of investment in the total assets constitute the fixed assets as well as current assets and investment of the firms. Generally, higher turnover ratio shows efficiency in utilization of firm's scarce resources and vice versa. The total assets turnover ratio of NEA has been computed by taking the data of net sales of electricity services.

Table no – 7

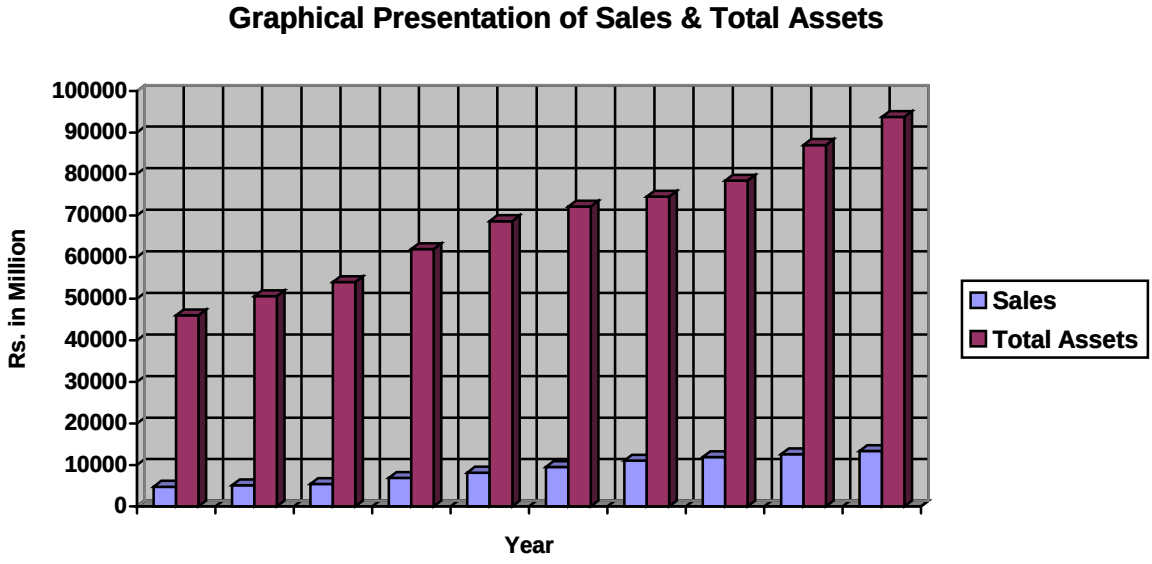
Calculation of Total Assets Turnover Ratio (Rs. in Million)

Year	Sales	Total Assets	TATOR
1997	4767.30	46027.70	0.10
1998	5082.50	50642.20	0.10
1999	5396.70	54017.70	0.10
2000	6856.00	61956.50	0.11
2001	8160.80	68674.30	0.12
2002	9476.20	72177.70	0.13
2003	11012.60	74545.30	0.15
2004	11874.80	78407.70	0.15
2005	12605.20	86991.80	0.15
2006	13331.90	93739.50	0.14

Source: Financial statement of NEA

According to table shown above, the gross revenue of NES has increased each year as compared to the revenue generating ability. Investment in assets has varied from Rs.46027.70 million to Rs.93739.50 million from the year 1997 to the year 2006. Total assets are the sum of fixed assets and current assets of the firm. Fixed assets have direst impact over the generation of the sales. But there are also other assets that contribute to the production and sales activities of the firms. Therefore the firm must manage its total assets efficiently should generate maximum sales through their proper utilization. The total assets turnover ratio showed the ability of generating revenue from all the financial resources committed to the NEA. The total assets turnover ratio indicates the sales generated per rupee of its investment in total assets. Though the TATOR is increase gradually per year, the result reflects the very poor status of the ratio. The average fixed assets turnover ratio during this period is calculated to be 0.13 as compared to rupee one investment in the total assets. The position of TATOR indicates that some major portion on NEA assets is remaining idle or they were not properly utilized.

Graphical presentation of sales and Total assets -3



The graph above shows the bar chart of sales and total assets of NEA. The graph shows that the sales of NEA are increasing gradually per year. Similarly the total assets of the NEA are also increasing gradually in every year.

The average return on total assets of NEA indicates that there has been unplanned investment in the assets of NEA without making proper analysis of cost and benefits. Attention did not seen to be paid in the revenue generation aspect of assets and their effective utilization as well as the cost of investments though the result of total assets turnover ratio does not seem to be satisfactory, it can be seen that the result is in the way to progress.

4.4.3 Inventory Turnover Ratio

The inventory or stock turnover indicates the efficiency of the firms' inventory management. Inventory turnover ratio of Nepal Electricity Authority for the study period is presented in the table below.

Table no-8

Calculation of Inventory Turnover Ratio (Rs. in Million)

Year	Sales	Inventory	ITR (in times)
1997	4767.30	804.00	5.93
1998	5082.50	914.90	5.56
1999	5396.70	740.00	7.29
2000	6856.00	982.30	6.98
2001	8160.80	960.90	8.49
2002	9476.20	1058.10	8.96
2003	11012.60	1017.20	10.83
2004	11874.80	1048.00	11.33
2005	12605.20	1372.70	9.18
2006	13331.90	1354.80	9.84

Source: Financial statement of NEA

According to the above table, the inventory turnover ratio of the Nepal Electricity Authority is 8.64 times on average. It varied from 5.93 times to 9.84 times from year 1997 to the year 2006. it showed that NEAs inventory management might be efficient. However it needs to be recorded that NEA is not an organization that needs large amount of inventory. The requirement of inventory in NEA is spare parts of power station, substation, transmission line and distribution lines.

4.4.4 Average collection period and Debtors turnover ratio

One of the major challenges with NEA at present is the problem of receivable management. It was due to mismatch of collection and its turnover. The way NEA has been in a position of manage the receivable is explained through the presentation of data taking from the period 1997 to 2006. While observing the ten years data the important variables like receivable, net revenue from sales have been considered to show their relationship with each other on a period wise analysis. So to see the relationship between receivable and net revenue from sales, the receivable turnover ratio and average collection period were computed.

The average collection period tells the average turnover of the day's receivable and outstanding, the average times it takes to convert them in to cash. Short average collection period shows the timely payment of debt and long average collection period indicates in efficiency of the firm in collection of receivable.

The debtor's turnover ratio and average collection period have been calculated in the table below.

Table - 9

Calculation of Average collection period and Debtors turnover ratio (Rs. in Million)

Year	Sales	Receivables	Collection Period (in days)	Change (in days)	Debtors turnover ratio (times)
1997	4767.30	1209.10	91		3.94
1998	5082.50	1435.40	102	11	3.54
1999	5396.70	1530.90	102	0	3.53
2000	6856.00	1525.50	80	-22	4.49
2001	8160.80	1678.50	74	-6	4.86
2002	9476.20	2284.90	87	13	4.15
2003	11012.60	3380.20	110	23	3.26
2004	11874.80	3735.70	113	3	3.18
2005	12605.20	3697.70	105	-7	3.40
2006	13331.90	4088.00	110	5	3.26

Source: Financial statement of NEA

Here,

$$\text{Average collection period} = \frac{\text{Receivable}}{\text{Sales}} \times \text{Days in year}$$

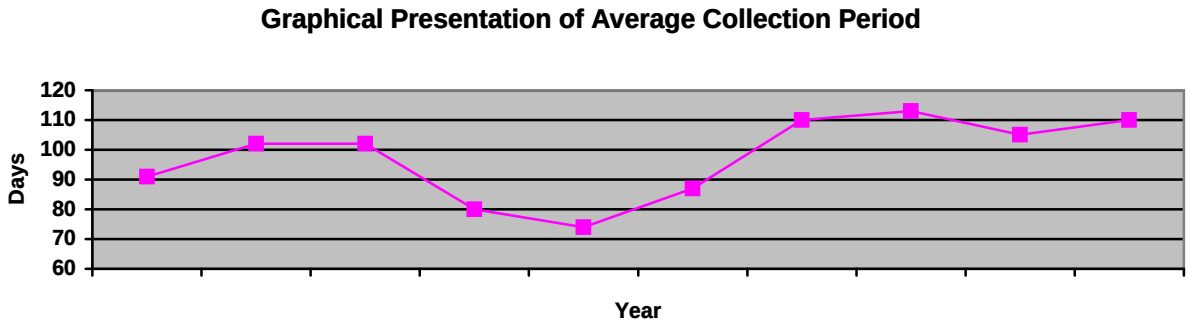
Average collection period (ACP) provides the information on the liquidity of the receivable. The shorter the period of collection, the higher is the debtor's turnover ratio. Higher duration of collection period is tying the wealth of business in the form of debtors.

In above table, it can be seen that the receivable is an increasing trend over the ten years study period. It increased from Rs.1209.10 million to Rs.4088.00 million from the year 1997 to the year 2006. The revenue from the sales of electricity is also in an increasing trend and it increased from Rs.4767.30 million to 13331.90 million from the year 1997 to the year 2006.

While calculating the average collection period, it has been observed that the collection period for the year 1997 was 91 days. Which increased by 11 days in the following year and reached 102 days? The ACP is constant 102 days in the year 1999. it was reduced by 22 days in year 2000 and reached to 80 days in year 2001, it also reduced by 6 days and reached 74 days. Then it can increase from year 2002 to the year 2004 and reached to 87,110 and 113 in year 2002, 2003 and 2004 respectively. In year 2005 it can reduce by 7 days and reached to 105 days. In study period final year, 2006 it can also increase by 5 days and reached to 110 days.

On the average the collection period of NEA is 99 days. The above table shows that there is no standard average collection period fixed by NEA. In discussion with NEA staff and looking at the financed document of NEA, The standard collection period can not be found. The standard collection period of 99 days on average is only approximate that is used in absence of standard developed by NEA. The causes behind the increase in ACP may be the unstable government and ineffectiveness in revenue collection. Government has issued some policies about the autonomy of NEA and issued a circular to pay the electricity bill in time for all offices. On the other hand, NEA has also started different programs to improve the collection of receivable by forwarding various attractive offers.

Graphical presentation of average collection period -4



The above trend line shows average collection period of NEA. According to the trend line, the average collection period of NEA is fluctuating. It shows that the collection of bill is not satisfactory as it is increasing except in some of the years that show the satisfactory collection period.

NEA being a government corporation although with an autonomous status did not seem to be serious in collecting the outstanding receivable looking at the various report. The famous researcher in this field DR. Manohar Krishna Shrestha has quoted in his research studies that timely legal action was not adequately taken to all defaulting customers nor has the government been serious to direct its offices to pay electricity bill timely on the ground of budget constraints or due to administrative negligence. On the other hand there was mismatch between the performance and expectation of staff.

NEA should take it seriously in the matter of collection of revenue. The NEA should improve the behavior and culture of the staff and it should be client oriented. On the other hand initiatives and corrective actions should be taken in revenue collection from different sectors especially dues with government agencies and institutions, which seemed to be the greatest defaulter. Finally it can be said that there is no any clear policy for debt management in NEA.

4.5 Profitability Ratio

Profitability Ratios are the measure of a firms earning capacity and operation efficiency. A company must earn sufficient amount of profit to survive and sustain in the future from its operation. Without profit no firm can exist and the future of the company will be jeopardized. Therefore profit is the ultimate outcome of any company.

Profitability ratios of the firm can be calculated in relation to sales and investment. Profit of NEA can be found by applying the profitability ratios. Profitability ratio indicate the corporations overall efficiency of operation. It is true that higher the profitability ratios better the financial position and vice versa.

4.5.1 Net Profit to Sales

The net profit margin establishes the relationship between net profit and sales. The ratio measures the firm's ability to change each rupee sales in to net profit.

Calculation of Net Profit to Sales (Rs. in Million)

Table no- 10

Year	Sales	Net Profit	Net Profit to Sales
1997	4767.30	1027.80	0.2
1998	5082.50	1181.50	0.23
1999	5396.70	1065.50	0.20
2000	6856.00	1230.60	0.18
2001	8160.80	1159.60	0.14
2002	9476.20	278.90	0.03
2003	11012.60	-1694.90	-0.15
2004	11874.80	-3475.20	-0.29
2005	12605.20	-4808.00	-0.38
2006	13331.90	-6095.80	-0.45

Source: Financial statement of NEA

Sales constitute the fundamental dynamic force in a business enterprise. Without sufficient sales of goods and services business may not be successful. The ratio of net profit to sales shows the profitability of the corporations indicating that the only increase in sales does not mean anything unless it commands profit. From this ratio it can also be acquired the information of the total expenses incurred during a certain period of time.

It may be difficult to decide for public enterprises like NEA as to how much margin of net profit is reasonable. According to Brigham, a profit around seven percent can be considered reasonable for an electricity company. According to above table, the NEA shows the profit of 22 percentages in year 1997. It can be increase and reached to 23 percentages in year 1998. Its profit margin is 20, 18, 14 & 3 percentages to the year 1999, 2000, 2001 & 2002 respectively. After year 2002 NEAs profitability is negative or NEA is in loss. The loss of NEA in year 2003, 2004, 2005 & 2006 are 15, 29, 38 & 45 percentages respectively. According to this table NEAs loss were increased every year. The reason behind the losses were heavy operating expenses, increasing burden of interest on long term loan and prior years expenses adjustment, depreciation, doubtful debts and deferred expenditure have also been the instrument to cut off profit margin. The revenue of the authority has been comparatively good till the study period. But after year 2003 the profit of authority is negative and in year 2006 the loss is very high.

Graphical presentation of profit and sales -5

The above bar chart of profit and sales of NEA shows that the profit of NEA is not satisfactory. NEA is facing losses in recent years though their sales are increasing by year. The profit of NEA seems to be satisfactory to the year 1997 to year 2001, after which it is declining and facing losses from the year 2003 to the year 2006. Though NEA is facing heavy losses, it seems to be doing well in the sales of electricity. The expenses in NEA still does not seem to be in due control therefore the management of NEA should take initiative actions to be reduce necessary and wasteful expenses.

The regression analysis between sales and net profit
The following result has been obtained by using regression analysis.

Interpretation:

- Assuming there is linear relationship between net profit (Y) and sales (X) . the line of best fit is

$$Y = 17585.44 - 2.10X$$

- By this regression equation, it is clear that the net profit is in decreasing trend and – 2.10 represent the decrement in the value of dependent variable (Y) then the value of independent variable (X) change by one rupee.

4.5.2 Net Operating Ratio

The net operating ratio establishes relationship between operating expenses and sales and revenue. The operating ratio is the yardstick of operating efficiency. The calculation of this ratio comprises computation of all operating expense, cost of goods sold and general administrative expenses. It indicates the average aggregate variety in expenses, where some of the expenses may be increasing while some may be falling. This ratio throws light on managerial policies and programs. In general, higher operating ratio is inefficient due to higher operation cost in terms of sales. Lower operation ratio is favorable, as it will generate higher operating income, which will be sufficient to meet interest, dividend and other expenses of the firm. The following table depicts the operating ratios of NEA over the period of ten years.

Table no – 11

Calculation of Net Operating Ratio (Rs. in Million)

Year	Sales	Operating Expenses	Net Operation Ratio
1997	4767.30	882.00	0.19
1998	5082.50	1110.90	0.22
1999	5396.70	1229.50	0.23
2000	6856.00	1415.00	0.21
2001	8160.80	1832.30	0.22
2002	9476.20	1621.80	0.17
2003	11012.60	1844.70	0.17
2004	11874.80	1865.20	0.16
2005	12605.20	2160.60	0.17
2006	13331.90	2123.20	0.16

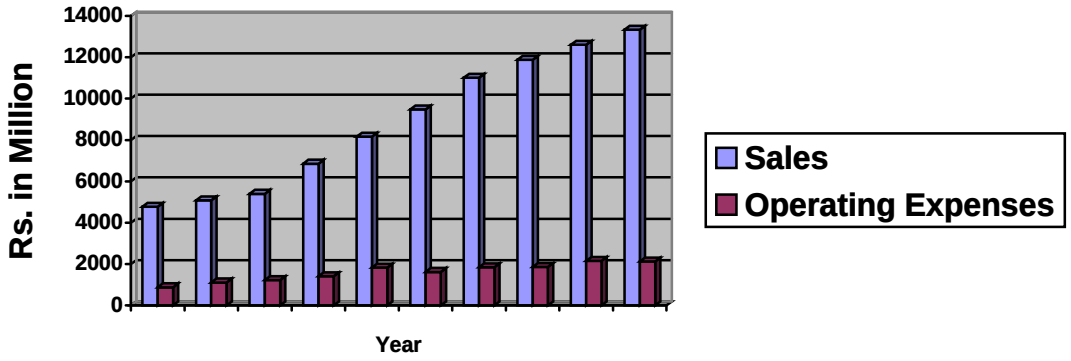
Source: Financial statement of NEA

According to above table, the operating ratio of NEA was 0.19 in the year 1997. Which indicate that 19 percentage of revenue was consumed by operating expenses and allowed 81 percentage of revenue to cover interest and other charges. Similarly the operating expenses was 0.22, 0.23, 0.21, 0.22, 0.17, 0.17, 0.16, 0.17 and 0.16 in the year 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005 and 2006 respectively. In all this study period, the average net

operating ratio of NEA was 18 percentages. That ten years study period good margin of revenue has been left. In conclusion, operating expenses of Nepal Electricity Authority during the study period could be termed satisfactory as it showed the sufficient operating income to meet interest, dividend and other expenses of the organization.

Graphical presentation of Net Operating Ratio -6

Graphical Presentation of Operating Expenses & Revenue



The graphical presentation of operating expenses and revenue shows that the operating expenses of Nepal Electricity Authority in increasing with the increase in its sales. The sales of electricity are increasing rapidly but the operational expenses rise slightly in compare to its revenue.

The regression analysis between revenue and operational expenses
By using the regression analysis the following results are obtained.

Interpretation

* Assuming there is a linear relationship between operating expenses(Y) and Revenue (X), the line of best fit is ,

$$Y = 1402.66 + 0.34X$$

- By using regression equation, it is clear that the revenue is in increasing trend and 0.34 percentages. The increment in the value of dependent variable (Y) when the values of independent variable (X) change by one rupee.

4.5.3 Return on Total Assets (RoTA)

Return on total assets records the relationship between total assets and net profit. It is the proportion of net income after taxes plus interest expenses to total assets (total investment). Return on total assets shows the percentage of net profit on total assets. The profitability of the firm is also measured in relation to investment. A firm makes a lot of investment on its assets with the expectation that the investment on such assets will yield a reasonable amount of profits. The return on total assets ratio measures the profitability of all financial resources employed in the firm's assets. As the relationship of satisfactory level profit is one of the

main objectives of the firm, this ratio shows the extent to which this objective is being achieved.

The return on total assets is the rate of return earned by the firm and whole for all its investments including the lenders. Higher return on total assets ratio shows higher earning of the firm in terms of its total assets. Lower ratio indicates unsound financial position due to low level of return.

Calculation of Return of Total Assets (Rs. in Million)
Table no – 12

Year	Net Profit After Tax (A)	Interest (B)	Profit (A+B)	Total Assets	ROTA (%)
1997	707.40	1207.50	1914.90	46027.70	4.16
1998	173.70	1317.20	1490.90	50642.20	2.94
1999	-96.00	1141.20	1045.20	54017.70	1.94
2000	185.10	1244.30	1429.40	61956.50	2.31
2001	-51.00	1188.20	1137.20	68674.30	1.66
2002	-860.70	1395.50	534.80	72177.70	0.74
2003	-1953.70	2973.40	1019.70	74545.30	1.37
2004	-1760.30	2991.50	1231.20	78407.70	1.57
2005	-1312.80	3079.80	1767.00	86991.80	2.03
2006	-1267.80	3050.90	1783.10	93739.50	1.90

Source: Financial statement of NEA

From the above table, it can be seen that the return on total assets of NEA for the year 1997 is 4.16 percent. This does not seem satisfactory for such a big enterprises. There has been gradual decrease in this ratio in the subsequent years with little fluctuation. The RoTA of NEA was 2.94, 1.94, 2.31, 1.66, 0.74, 1.37, 1.57, 2.03 and 1.90 in the year 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005 and 2006 respectively. These falling ratios were the result of heavy and uncontrollable general and operating expenses. The volume of total assets has increased over the years along with other operating expenses and depreciation but no increment has occurred in the volumes of profit accordingly. On the average, the return on total assets on NEA is 1094 percentage which is not good at satisfactory.

The reason behind the low return on total assets of NEA was mainly the excess investment made on assets then actually required and the inefficient utilization of these assets. Due attention should be paid to effectively utilize these assets in order to generate a reasonable amount of profit on the investment made in the assets of NEA. The return on total assets percentage shows satisfactory performance in first one year 1997. But then it was not able to cover the average rate of return on total assets and last two years have shown some investment in the rate of return on total assets. The overall ratio analysis indicates relatively poor performance of NEA.

4.6 Leverage Ratio

4.6.1Debt Equity Ratio (D/E ratio)

The ratio between total debt and equity is called debt equity ratio. The procedure of calculating the debt equity ratios has been already discussed in chapter three. The debt equity ratio of NEA is table below.

Calculation of Debt Equity Ratio (Rs. in Million)

Table 13

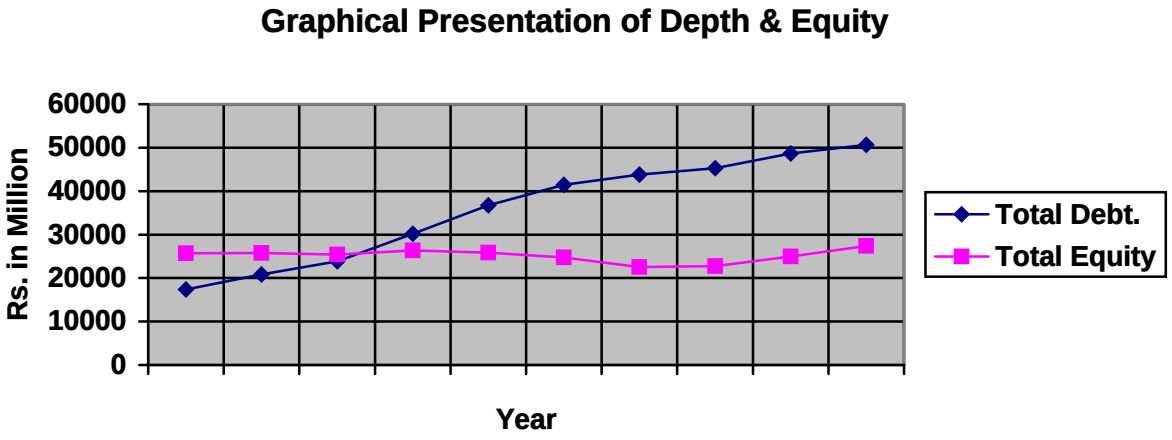
Year	Total Debt.	Total Equity	D/E Ratio
1997	17403.20	25699.30	0.68
1998	20848.40	25788.80	0.81
1999	23824.30	25406.10	0.94
2000	30155.70	26323.60	1.15
2001	36707.50	25853.00	1.42
2002	41474.50	24755.10	1.68
2003	43786.00	22561.20	1.94
2004	45252.00	22766.50	1.98
2005	48686.40	24987.90	1.95
2006	50636.80	27397.40	1.85

Source: Financial statement of NEA

For the above table it can be seen that the Debt Equity ratio of Nepal Electricity Authority in the year 1997 is 0.68. The total debt in the year 1997 is 17403.20 million and total equity is 25699.30 million in same year. The ratio of debt equity is increasing trend from year 1997 to year 2004. In that period the P/E ratio is increased from 0.68 to 1.98. In year 2005 and 2006 the ratio of debt equity is decreasing trend. In that year the D/E ratio is 1.95 and 1.85 respectively.

The total debt increases from Rs.17403.20 million to Rs.50636.80 million from the year 1997 to the year 2006. This is more then 2.91 times more then beginning year. Equity also increases from Rs.25699.30 million to Rs.27397.40 million from the year 1997 to the year 2006. This is 1.6 times more then the beginning year. The result shows that the increasing tendency of debt is very high then equity. This indicates that the profitability and financial position of NEA is not in good position. NEA should pay huge amount of revenue for hiring long-term loan. In this situation, NEA cannot save the income thus NEA should review the hiring policy of long-term loan.

Graphical presentation of debt and equity -7



The graph above shows that the relation between total debt and total equity of Nepal Electricity Authority. The trend line of debt and equity indicates that the increasing tendency of debt is very high then the equity. The graph shows that the position of NEA is not satisfactory to cover its long-term debts as its equity is decreasing in proportion to its increment in debt.

The regression analysis between Equity and Debt.
By using regression analysis, following results are obtained.

Interpretation:

- Assuming there is a linear relationship between Debt (Y) and Equity (X), the line of best fit is

$$Y = -5463517.49 + 218.63X$$

By this regression equation, it is clear that the equity is in increasing trend and 218.63 represents the increment in the value of dependent variable (Y) when the value of independent variable (X) change by one rupee.

4.6.2 Total Debt Ratio

The relationship between total debt and net worth is called total debt ratio or debt total assets ratio.

Calculation of Total Debt Ratio (Rs. in Million)

Table 14

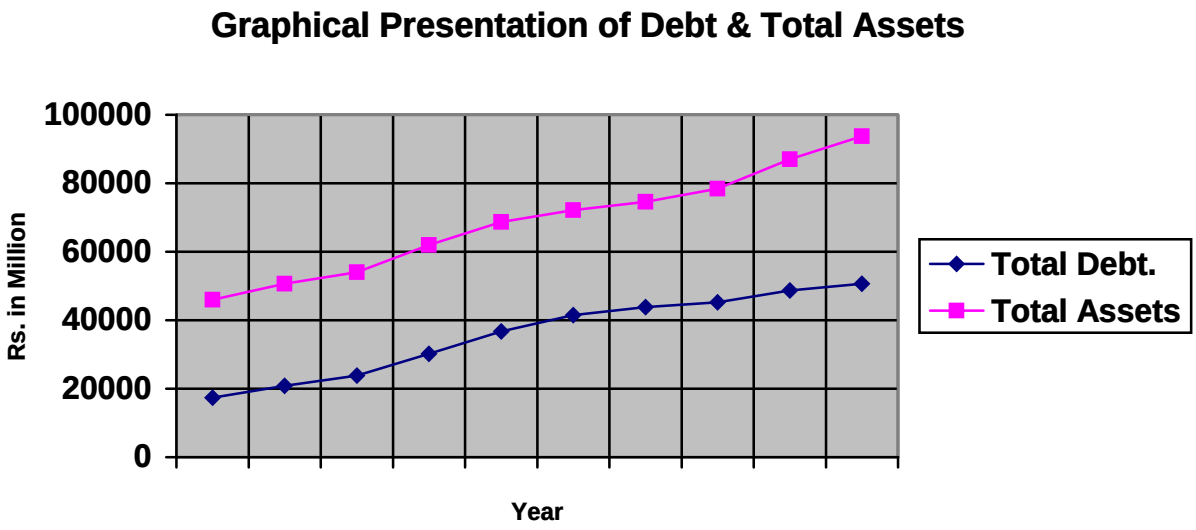
Year	Total Debt.	Total Assets	D/TA Ratio
1997	17403.20	46027.70	0.38
1998	20848.40	50642.20	0.41
1999	23824.30	54017.70	0.44
2000	30155.70	61956.50	0.49
2001	36707.50	68674.30	0.53

2002	41474.50	72177.70	0.57
2003	43786.00	74545.30	0.59
2004	45252.00	78407.70	0.58
2005	48686.40	86991.80	0.56
2006	50636.80	93739.50	0.54

Source: Financial statement of NEA

The above table shows that the total debt ratio is 0.38 in the year 1997. The from the above table shows that the debt total assets ratio is increasing trend from the year 1997 to the year 2003. Then the ratio is slidely decrease from the year 2004 to the year 2006. The amount of debt increases from Rs.17403.20 million to Rs.50636.80 million from the year 1997 to the year 2006.This is 2.90 times more then the beginning year. Similarly, the amount of total assets increased from Rs.46027.70 million to Rs.93739.50 million to the year 2006 which is 2.03 times more then the beginning year. The result shows that both the debt and investment in assets is in increasing tendency but the increasing tendency of the debt is very high then increasing tendency of assets.

Graphical presentation of Debt and Total assets -8



The graphical presentation of total debt and total assets of Nepal Electricity Authority is shows above. The graph shows that both the total debt and total assets of NEA is increasing tendency. But the increasing tendency of debt is very high then the increasing tendency of assets. Thus the result shows that the financial position of NEA is not satisfactory to meet its long-term debt.

4.6 Analysis of Primary Data :

Fulfillment of two objectives some questioner to be made and given to NEAs officer level staff. The questioner for analysis of loss and find out loss reduction effort and to find out past and present challenges of NEA are as follows.

(I) IF NEAs system loss is increasing every year?

(II) What are the main causes of increasing system loss?
(III) If operating expenses of NEA is increasing every year?
(IV) What are the causes of increasing operating expenses?
(V) What effort has done to reduce system loss and operating expenses?
(VI) What are the past and present challenges of NEA?

These questioners are given 20 officer of NEA.they providing these questions answer and provide their view. Around 80-percentage answer are positive for this question. Basis of this answer the analysis of this answer as follows.

4.6.1 If NEAs system loss is increasing every year ? And what are the main causes of system loss?

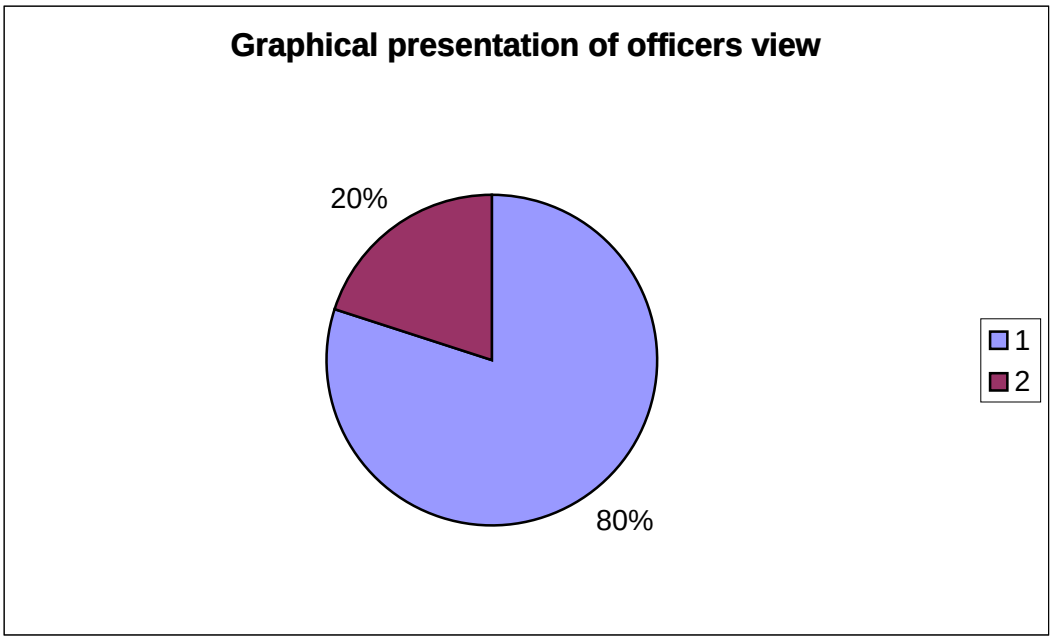
For this question among 20 officers , 4 officers answer are against the increase in system loss and 16 officers are agree to increase energy losses every year. They say , loose administration, Direct hooking, old transmission line, old distribution line, lack of maintenance of line, Transformer and other equipment and distance between two Transformer are long are the main causes of increase energy losses of NEA.

Presentation of officer's view in table

Subject	YES	NO	Total
Increase in system losses	16	4	20
Total no. of staff	**16**	**4**	**20**

In above table the four officers of NEA among twenty are said that, there is no increase in system loss every year. Other sixteen officers are said that the losses of NEA are increasing every year. This view shows that the system losses of NEA are increase every year.

Graphical presentation of officer's view -9



The above graphical presentation of view of officers that energy losses every year show the system loss of NEA is increase every year. 80 percentages of NEAs officers said their system loss is increase every year and 20 percentage of NEAs officers view is against loss increase. The main causes of energy losses are old structure of transmission and distribution line, long distance of two transformers, direct hooking, loose administration and lack of proper maintenance.

The total loss figure includes both technical and non technical losses. As issue of technical losses reduction needs large investment and considerable executing time. The effort in to date are basically of curative nature and do not address all the issue contributing to high system loss. Every NEAs Regional office and District level office has organized at least one Vigilance group to track theft of electricity. This group analysis the area loss and conducts raids in the area where loss is increasing. They forfeit the materials used for unauthorized connections as well as disconnect the supply of consumers found tempering the meters. The concerned consumer are penalized as for the Electricity Theft Act 2002.The loss reduction projects under take in the past greatly enhance the capabilities of NEA technicians in the investigation of theft cases.

Every Business center of all core businesses compile the energy received sent \ sold station consumption and office consumption. This is for worded to the superior office as well as to the loss reduction division of NEA. The regional office of NEA checks the figures and method applied for any error and seeks the correction from the initiating office.

Analysis of the energy losses of NEA, other findings are

I. Incorrect meter reading.
II. Incorrect meter connection.
III. Unauthorized Connections / direct hooking.
IV. Sustained high resistance fault.

4.6.2 If operating expenses of NEA is increasing every year? And what are the main causes of increasing operating expenses?

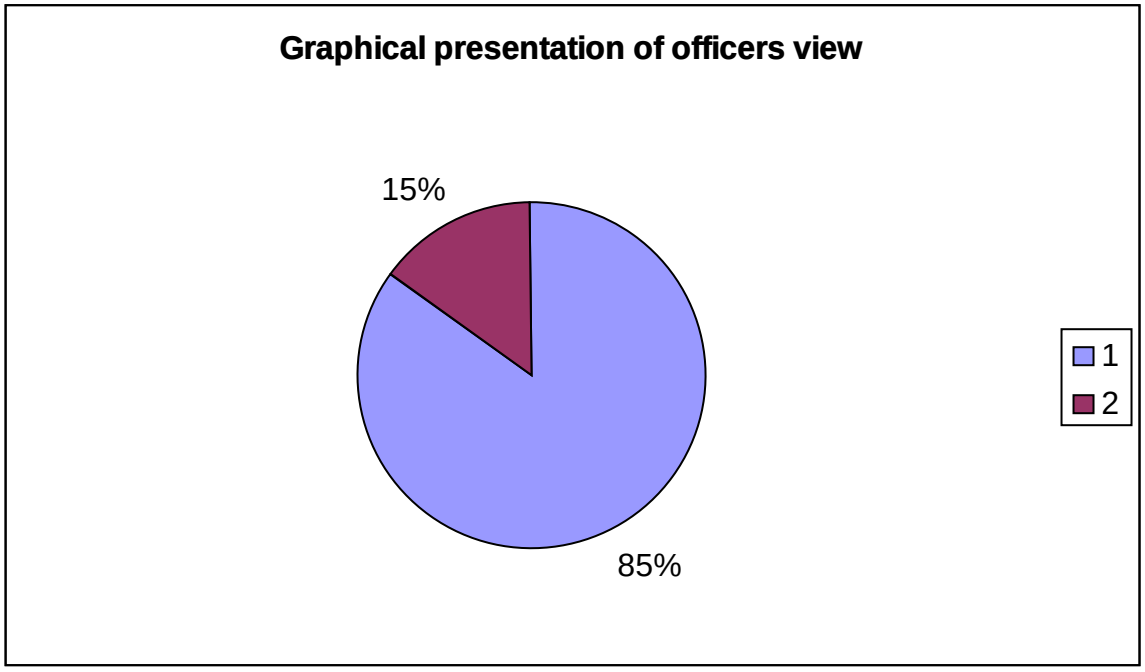
Among 20 officers of NEA, 17 officers said that the operating expenses of NEA are increase every year and rest 3 officers said that the operating expenses are not increase every year. Those officers who said that the operating expenses are increase every year, the main causes are, increase in material price, high interest cost to pay Government, increase in staff cost every year, costly maintenance, old technology, cartage of equipment, operation of thermal plant, etc.

Presentation of officer's view in table

Subject	YES	NO	Total
Increase in operating expenses	17	3	20
Total no. of staff	**17**	**3**	**20**

In above table Shows that seventeen officers of NEA said the operating expenses of NEA is increase every year. And three officers of NEA said that the operating expenses of NEA is not increase every year.

Graphical presentation of officer's view -10



In above graphical presentation of view of officers of NEA, 85 percentages of officers said that the operating expenses of Nea is increasing every year. and 15 percentage of officers

said that the operating expenses of NEA is not increase every year. the main causes of increase operating expenses are : increase in material price, high interest and royalties paid to Government, increase in staff facilities, shortage of equipments, increase in bad debts, old technology etc.

The operating expenses increasing rate is higher then the increasing rate of Revenues collection of NEA every year. So the losses of NEA are increase every year. The causes of increasing losses is not adjustment of Tariff rate every year and do not stop the increasing trend of maintenance expenses. The pre planed maintenance program as not adopt. This cause generates high expenditure in maintenance but not quality build up.

Among expenses heading of NEA , the overtime , operation and maintenance , Traveling expenses and stationery expenses are highly increase in every year . These expenses are suddenly suitable in case of increasing new program and pre planed maintenance have also done. but increase un-productive expenses is serious. un-planned maintenance system puts double , triple expenses in same work but the quality of work is not increase . So the administrative expenses like traveling, stationery, overtime etc are adapt to planed economy managed system. If every office of NEA takes economic discipline and cost control mechanism, it can reduce operating expenses and overall financial position is strong.

4.6.3 What effort has done to reduce system loss and operating expenses?

For this questioner among 20 officers of NEA, they provide different effort to be done. The main efforts are:

- Regular maintenance of Machine, Transmission line and distribution line.
- Control of direct hooking of distribution line.
- Review of power purchase agreement with private sector.
- Reduction in political pressure in NEA.
- Adopt skilled manpower recruitment policy.
- Other extra facilities are not providing to Staffs.
- Budgetary control.
- Corruption control.

Reduction of system losses and operational expenses, NEA have lunch a new plan. These plans control the unproductive operating expenses. Every NEAs Regional office and district level office has organized at one vigilance group to track theft of electricity. This group analysis the area losses and conducts raids in the area where loss is increasing. The Power Purchase Agreement (PPA) with private sector power producer also necessary to review. Every PPA agreement is in payment of US Dollar. In fluctuation of rare of dollar, the purchase rate of power is also fluctuated so NEA takes the policy of PPA in Nepalese Currency. New project made or collapse is directly interest in political pasties. Hire of office building, construction tender work order, Responsibility given to staff are also made in instruction of political parties.

There is around 10 thousand staff working in NEA. NEA expand its service in 75 district of Nepal but manpower mobilization is not suitable in every district, NEAs every personnel want to transfer in developed district and rural area there is no qualified and trained staff. Some times large number of lower lever personnel are joint in NEA directly prescription of political parties. A spirited motivated, skillful, honest and delight staff is bound to perform well which can achieve organizational goals of objectives effectively. Government should

provide more Autonomy the management of NEA and make them more responsible and accountable according to their work. Actually there is a need of adopting non- interference policies as the act have endowed it with significant authority.

4.6.4 What are the past and present challenges of NEA?

The officers of NEA said that the main challenges of NEA in proper operation are :
- How to reduce budgetary loss
- How to collect revenue from public
- How to generate 10000 MW energy in 10 years
- How to reduce load shedding
- How to prevent direct hooking in different area
- How to manage its huge assets
- How to manage fund
- How to mobilize its staffs
- Competition with private power producer
- Review of power purchase agreement
- Corruption control of NEA etc.

NEA identified several key measures that will improve the quality of service short term and medium term. Demand side Management and loss reduction activities will be given top priority in an effort to augmentation in generation capacity along with an improvement of transmission lines not only to meet the domestic demand but also to capitalize on the emerging cross boarder treading opportunity. In this context NEA as a key institution in the power sector is endeavoring to expand its generation capacity in the most economical manner. NEA should focusing on medium size projects like the upper trishuli-3A, trishuli-3B and rethought which can be implemented at the earliest to meet financial limitations with the private sector for investment in large projects. NEA should adopting a policy to develop such hydroelectric projects under Public Private Partnership (ppp) modality.

NEA should work noble approach to raise the necessary capital to meet part of investment requirement through issuances of power Bond in the local market. These bonds will be issued in multiple investments in new generation projects. Also the ruler communities are showing keen interest and actively participating in the electrification of respective village, NEA will continue to be involved in the community based rural electrification programs.

NEA request government of Nepal to reduced re- landing rate of significant investment in rural electrification and high cost projects implemented under foreign rationalization and further reduction of re- landing rates similarly NEA will continue to urge the government for adaptation of prudent policy in order to mobilize the liquidity available in the domestic marker for the power sector development. NEA will continue it's persuasive efforts for achieving the rationalization and re adjustment of rational tariff .

Findings of Secondary Data analysis

Leverage:

The degree of operating leverage of NEA in the study period is around 1.19 to –4.31. The DOL of NEA is always negative. That means increase in sales not generate sufficient profit. The Degree of Financial Leverage of NEA at 10 years study period is very fluctuated. In the year 1997 to 2002 the DFL is positive, then the remaining years DFL of NEA is negative. It indicates that the profitability of NEA is negative and loss is increasing trend in every year. The 10 years study period of NEA the degree of combined leverage is very fluctuated. In year 1998 the DCL of NEA is –11.48 and last year of study period 2006 the DCL of NEA is 0.56. in this ten years study period the degree of combined leverage is always negative. The equity per share or earning power of investor is not satisfactory.

Liquidity Ratio:
The current assets of NEA are less then the current liabilities through out 10 years. Current assets can not cover the current liabilities. Current ratio less then 1 shows the negative symptoms in organizational performance. In such situation the liquidity position of the organization becomes poor.

Utilization of Assets:
NEA has invested huge amount of fixed assets but the revenue generating ability of NEA is very low in comparison to the investment on fixed assets. the average fixed assets turnover ratio is 0.19 and average total assets turnover ratio is 0.13 times. Therefore it can be said that the management of NEA has not been utilizing the assets properly. As a result the turnover ratio is very low and capacity utilization factor is very low in NEA. Resources that are kept idle are also responsible for the result.

Inventory Turnover:
The inventory turnover ratio is fluctuating trend for the study period. It indicates greater utilization of inventory. The average inventory ratio was 8.64 times. it can be concluded that the inventory turnover of NEA is satisfactory.

Receivable Management:
The analysis of financial statement of NEA in 10 years study period, it can be known that debtors are the most sensitive for the management. The average collection period of NEA is 99 days. Because of long period taking in collecting the outstanding debt, the debtor turnover ratio is very low. It seems that NEA is not adopting the proper receivable management policy. The increasing trend of ACP indicates that NEA not improves the credit management and adopts efficient credit policy.

Net profit to sales position:
From the above analysis of net profit to sales position, it can be seen that NEA has achieved poor results with losses in last four years of study period. It has not been able to pay interest charges on long-term debts from its operation because the in efficient utilization of fixed assets resulted in low profitability position threatening the very existence of NEA in the long run. The profit percentage ranged from 0.45 to 0.23 during the study period. The profit percentage is in declining trend. This did not indicate the financial viability of NEA. Huge amount of expenditures have become instrumental to reduce profit-earning capacity of NEA.

Net operating ratio:
The analysis shows that the net operating expenses ratio of NEA has a kind of constant trend. The operating ratio varied from 16 percent to 23 percent with slight change of 1 or 2

percentages in each year. The average operating ratio is 18 percentages during the study period. This shows that the problem might not have reached serious, but there is possibility to further bring down the operating expenses if a cost control measure is adopted.

Return on Debt Equity:
The debt of NEA has increased from Rs.17403.20 million to Rs.50636.80 million during the study period. The debt equity ratio increased from 0.68 to 1.85 and the average D/E ratio is 1.43 the D/E ratio is in increasing trend. This shows that the amount of debt is increasing in comparison to the amount increased in equity.

Findings of primary Data analysis:

System Losses:

NEA's system loss is very high which attracts loss regularly. NEA's system loss should be around 15 percentage whereas total loss is around one fourth of total energy available i.e.25 percentage of total energy. The system loss of NEA is around 10 percentage more than standard (15percentage as suggested by Bidyanath Nepal Committee), which includes pilferage and technical loss. Knee's self-consumption is around 1 percentage as explained by concerned NEA staff. A 5 Percentage reduction in the loses shall be equivalent to 30 MW generation addition. And a one-percentage reduction of loss can fetch Rs.54 million extra money for NEA. loose administration, Direct hooking, old transmission line, old distribution line, lack of maintenance of line, Transformer and other equipment and distance between two Transformer are long are the main causes of increase energy losses of NEA.

Operating expenses:

The operating expenses increasing rate is higher then the increasing rate of Revenues collection of NEA every year. So the losses of NEA are increase every year. The causes of increasing losses is not adjustment of Tariff rate every year and do not stop the increasing trend of maintenance expenses. The pre planed maintenance program as not adopt. This cause generates high expenditure in maintenance but not quality build up. Increase in material price, high interest and royalties paid to Government, increase in staff facilities, shortage of equipments, increase in bad debts, old technology etc are the other variables of increase in operating expenses every year.

Past and present challenges:

The main challenges of NEA in proper operation are, budgetary loss control collection of revenue from public, reduction of load shedding, control of direct hooking in different area, assets management, fund management, mobilization of manpower, competition with private power producer, Review of power purchase agreement, Corruption control and How to generate 10000 MW energy in 10 years.

Chapter-5

SUMMARY, CONCLUSION AND SUGGESITIONS

5.1 Summary

The profitability and overall financial performance of Nepal Electricity Authority has been analyzed in the previous chapter by using various financial and statistical tools. Based on the analysis, some of the important findings, conclusions and recommendations are discussed below to provide alternative ways of improving the financial performance of NEA.

The analysis of the study of increasing energy losses and operating expenses and its impacts in profitability of NEA through the application of various financial and statistical tools provides a different kind of results. Summary of major findings of the study are presented below.

Liquidity Position

According to the analysis of assets and liabilities the liquidity position of NEA not to be good. The average current ratio of NEA is 0.88:1. The current assets of NEA are less then the current liabilities throughout 10 years. This shows that the current assets cannot cover the current liabilities of the organization. Current ratio less then 1 shows the negative symptoms in organizational performance. In such situation the liquidity position of the organization becomes poor.

The average quick ratio shows that the liquidity position of NEA is very poor as compare to that of current ratio. The average quick ratio of NEA is 0.47:1, which is less then 1. the current ratio of NEA in calculating period from year 1997 to the year 2006, it is declining and less then 1. so the study of quick ratio depicts that the organization is not really in position to cover its current liabilities.

Utilization of Fixed Assets

NEA has invested huge amount of fixed assets but the revenue generating ability of NEA is very low in comparison to the investment on fixed assets. The average fixed assets turnover ratio is 0.19 times. It shows that there is no effective utilization of fixed assets.

It is therefore recommended that NEA should not invest much in plant and other fixed assets without making proper cost beneficial and target analysis. When investment is made, effort should be given to the optimum utilization of these assets with in the fixed target. So that it does not cause any constrain on the profit earning to the assets.

Utilization of Total Assets

The average total assets turnover ratio is 0.13, which is not very satisfactory in comparison to the investment to the total assets. The investment in the total assets increased from Rs.46027.70 million to Rs.93739.50 million from the year 1997 to 2006. Over the period, trend of increment in total assets is very high. Therefore it can be said that the management of NEA has not been utilizing the assets properly. As a result the turnover ratio is very low.

It clearly shows that capacity utilization factor is very low in NEA. Resources that are kept idle are also responsible for the result.

Inventory Turnover Ratio

Inventory of the Nepal electricity Authority followed fluctuating trend. On the beginning year 1997 to the year 2000, it can be increasing trend then it should slightly decrease in the year 2000. Then it can be increase from the year 2001 to the year 2006. so the fluctuating trend for the study period indicates greater utilization of inventory. The average inventory turnover ratio was 8.64 times. The degree of utilization of inventory either constantly decreased or constantly increased over the period of time. Thus it can be conclude that the inventory turnover of NEA is satisfactory.

Receivable management

From the above analysis of financial statement, it can be known that debtors are the most sensitive for the management of any organization. The average collection period is 99 days over the study period for 10 years. The collection period of some years is more then the average standard collection period. Because of long period taking in collecting the outstanding debt, the debtor's turnover ratio was much low. It seems that NEA is not adopting the proper receivable management policy. The increasing trend of ACP indicates that NEA not improves the credit management and adopts efficient credit policy.

NEA is obliging to maintain its collection period at 90 days as per long agreements between the World Bank and ADB. The highest and lowest credit collection periods are about 110 days and 74 days with in the study period. From the year 2001 NEA shows the improvement in its collection period but then it extensively increased in the year 2006, and reached 110 days. The reason behind the raise in ACP may the low level of performance in collection dues. Most of the staff in NEA at the operational level even do not know the targets fixed for collection period. The ACP is also directly affected by the rise in the tariff.

Net Profit to Sales Position

From the above analysis of net profit to sales position, it can be seen that NEA has achieved poor results with losses in last four years of study period. It has not been able to pay interest charges on long-term debts from its operation because the in efficient utilization of fixed assets resulted in low profitability position threatening the very existence of NEA in the long run. The profit percentage ranged from 0.45 to 0.23 during the study period. The profit percentage is in declining trend. This did not indicate the financial viability of NEA. Huge amount of expenditures have become instrumental to reduce profit-earning capacity of NEA.

Net Operating Ratio

The analysis shows that the net operating expenses ratio of NEA has a kind of constant trend. The operating ratio varied from 16 percent to 23 percent with slight change of 1 or 2 percentages in each year. The average operating ratio is 18 percentages during the study period. This shows that the problem might not have reached serious, but there is possibility to further bring down the operating expenses if a cost control measure is adopted.

Return on Total Assets

Return on total assets records relationship between total assets and net profit. The average return on total assets during the study period is 1.94 percent. The average return on total assets has been varied from 0.74 to 4.16 percent. This shows that the return on total assets is not satisfactory. It can be conclude that the return has not increased to commensurate increase in the investment. It indicates that there was not efficient utilization of total assets in NEA during the study period 1997 to the year 2006.

Return on Debt Equity

The debt of NEA has increased from Rs.17403.20 million to Rs.50636.80 million during the study period. The debt equity ratio increased from 0.68 to 1.85 and the average D/E ratio is 1.43 the D/E ratio is in increasing trend. This shows that the amount of debt is increasing in comparison to the amount increased in equity.

Return on Total Assets

The average total debt total assets ratio is 0.52. Which is satisfactory but the management always needs to be aware of whether the investment of debt has been properly utilized in the investment of proper and important assets, plants and machineries.

System Loss

NEA's system loss is very high which attracts loss regularly. NEA's system loss should be around 15 percentage whereas total loss is around one fourth of total energy available i.e.25 percentage of total energy. The system loss of NEA is around 10 percentage more than standard (15percentage as suggested by Bidyanath Nepal Committee), which includes pilferage and technical loss. NEA's self-consumption is around 1 percentage as explained by concerned NEA staff. A 5 Percentage reduction in the loses shall be equivalent to 30 MW generation addition. And a one-percentage reduction of loss can fetch Rs.54 million extra money for NEA.

Leverage

The degree of operating leverage of NEA in the study period is around 1.19 to –4.31. The DOL of NEA is always negative. That means increase in sales not generate sufficient profit.

The Degree of Financial Leverage of NEA at 10 years study period is very fluctuated. In the year 1997 to 2002 the DFL is positive, then the remaining years DFL of NEA is negative. It indicates that the profitability of NEA is negative and loss is increasing trend in every year.

The 10 years study period of NEA the degree of combined leverage is very fluctuated. In year 1998 the DCL of NEA is –11.48 and last year of study period 2006 the DCL of NEA is 0.56. in this ten years study period the degree of combined leverage is always negative. The earning per share or earning power of investor is not satisfactory.

5.2 Conclusion

Financial statements are considered as the sample of input in laboratory test of the organizations. Their analysis gives idea about how efficiently the organization is being

managed and how effectively the resources of the organization are utilized. The study concentrates on the performance of NEA over 10 years of period ending 2006. Its performance has been analyzed with the help of analysis of financial statements of the organization for the period of 1997 to 2006. Applying Du-pont analysis approach. While analysis has been made it is found that the returns of NEA are not well in the second half period of the study. As per the results mentioned in analysis part one of the reasons for negative ROE is because of high interest cost. Therefore it is beneficial to NEA to raise funds from domestic sources rather than sacking foreign depth even if the interested is lower in foreign depth. The receivables of NEA have not been managed well therefore it is better to try to manage its assets effectively to improve its returns.

Based on the major findings, it is found that there are various problems in NEA. These problems are different in their nature and importance. Some of the problems are affecting to a greater extent and some of them are affecting lower extent to its profitability problems that are affecting to greater extent to the profitability of NEA are listed below as major issues and gaps. More attention is needed to these issues that are affecting significantly to the profitability NEA. Major issues can be pointed out as follows.

1. There is no effective utilization of assets in NEA.
2. NEA has been facing the problems of outstanding debt collection. Though the problem is in control over some years, it has been highly increased in last year. The account receivable of NEA is recorded high.
3. From the overall analysis, NEA has generated very low returns with the negative profitability in some year throughout the study period.
4. The capacity of assets in the generation of revenue is not satisfactory and the revenue earned is very low in comparison to the investments made in the assets.
5. Increasing cost in each fiscal year is another important issue of NEA. There is no effective cost control mechanism.
6. Electricity leakage, theft and wastage have been the major reasons behind reducing the profit earning capacity of NEA. Similarly, high maintenance expenditures have also been an important factor in reducing the profitability of NEA.
7. The project does not seem to have been carried with proper feasibility analysis.
8. There are also other issues that NEA has not considered in its business principle. The idea of privatization in the electricity sector is ahead. The Butwal Power Company, a private sector Co. is already working in this field. Therefore there is possibility of entry of other private investors in the electricity sector in near future also. But NEA does not seem to be in a position to meet the competition with private sectors.

5.3 Suggestions

Based on the conclusion, appropriate recommendations have been suggested in a practical way to improve the profitability and overall financial position of Nepal Electricity Authority.

1. Adoption of effective mechanism to improve liquidity position:

   The Authority's liquidity position is not satisfactory. Though the current ratio is satisfactory, the analysis of quick ratio shows the problem in the liquidity position. This indicates that the NEA must show some seriousness to improve its liquidity position by adopting effective mechanism. It is important for the corporation to behave like an entrepreneur to make the best use of liquid fund. It has to estimate how much funds is needed for immediate use and all the unused funds should be invested in marketable securities to generate some income. It is observed that there is inconsistency in between current assets and current liabilities of the authority. Hence the authority should adopt efficient working capital policy to make the stability in liquidity position. Current assets and current liabilities for the coming year can be predicted by analyzing the past data and future target.

2. Development of efficient system of revenue collection:

NEA has a large number of customers ranging from domestic, industrial to government and public undertakings. While serving to such large number of customers, NEA requires a efficient system of revenue collection so that revenues do not remain tied up in the bills receivables. The receivables are unproductive and pose implications in reduction of volume of profits. The collection system should trend equally to all customers and should not be influenced by political pressure. Revenue accounting should be given adequate importance like expenditure accounting by budget center chiefs and responsible personnel should be appointed to handle this section.

3. Improvement in Human resources

Human resources are the key to the success of any organization. The organizations staffs are the main brain to utilize the organizational assets more effectively and efficiently through which NEA can increase its profit earning capacity. A spirited, motivated, skillful, honest and delight staff is bound to perform well which can achieve organizational goals and objectives effectively. Thus organization must invest in human resources development to prepare qualified, dynamic and energetic personnel. NEA should analysis and try to maintain high spirit in its staff by providing right appointments, motivation, training and promotional opportunities.

4. Immediate action should be taken

NEA staff should be oriented towards discipline of working efficiently by demanding explanation for delays in service. Immediate action should be taken for delays causing inconvenience to the consumers. It is necessary to identify and find when the delay originates and adequate incentives and reward should be made raise the morale of the staff.

5.Efficient Utilization Of Assets

NEA has not achieved success in the Management its assets within the organization. Efficient utilization of assets can generate additional income without additional cost. Therefore, NEA should pay attention to improve the utilization factor of its assets. This is more important in case of future acquisition of assets with higher capacity utilization factor should be selected to improve the earning capacity.

6 Application of effective cost and loss control mechanism

NEA's operational efficiency is very low. With one fourth of generation loss and inefficient use of resources, NEA is bound to sustain huge loss. NEA has always been increasing tariff to compensate those losses, which is not a prudent action. This clearly means that NEA's inefficiency has been passed on to customers. To improve the situation NEA should apply Effective cost and loss control Measures.

7 More autonomy should be provided

Without providing more autonomy, NEA management will not be able to work effective. The decision – making procedure is very long in NEA. With the acceptance of government, NEA management cannot take any vital decision Due to these causes, sometimes NEA is bound to give up the opportunities. Thus government should provide more autonomy to the management of NEA and make them more responsible and accountable according to their work. Actually there is a need of adopting non-interference policies as the act has endowed it with significant authority.

8 Other Suggestions

I. NEA should control industrial energy theft by using efficient mechanism.
II. NEA should be more efficient in mobilizing its resource in the years to come. NEA should be careful to mange its resources properly so that full capacity utilization could be achieved.
III. NEA should be careful in selecting investment projects. Higher IRR and other criteria are definitely complimentary in high efficiency in mobilization of resources. Therefore, NEA should depend on these models to reduce the high cost of service in future otherwise NEA is bound to increase tariff regularly to increase the revenue base, which is not desirable and in many cases financially not viable.
IV. NEA must rationalize its expenditure for the achievement of desired profit.
V. While borrowing debt the amount borrowed be carefully use based on the cost benefit analysis. Otherwise, NEA might face some serious problems in future.
VI. Effective cost control measures must be adopted immediately to improve the operational results.
VII. NEA must show efficiency in reducing the loss, which can increase its profits definitely. But over the review period, NEA has not been able to achieve progress in loss reduction activities despite clear instruction from Electricity Tariff Commission to maintain its loss rate at less than 20 percent.
VIII. The development of organization and management system on the part of NEA should be efficient. It should develop on the basis of its past experience, effective target – oriented project planning incorporating proper cost- benefit and financial plan so that target are achievable and profitability is ensured at least to the minimum extent.

Annex-1

Present performance of NEA :

Hydropower Station

Existing

1) Trishuli	- 24,000KW
2) Sunkoshi	- 10,050KW
3) Gandak	- 15,000KW
4) Kulekhani-I	- 60,000KW
5) Devighat	- 14,100KW
6) Kulekhani-II	- 32,000KW
7) Marshyangdi	- 69,000KW
8) Puwakhola	- 6,200KW
9) Modikhola	- 14,800KW
10) Kaligandaki "A"	- 1,44,000KW
Total	**- 3,89,150KW**

Under Construction (NEA)

1) Middle Marsyangdi	- 70,000KW
2) Chamelia	- 30,000KW
3) Kulekhani III	- 14,000KW
Total	**- 1,14,000KW**

Thermal Power Station

1) Biratnagar	- 1028KW
2) Hetauda	- 12,750KW
3) Marsyangdi	- 2250KW
4) Duhabi Multifuel-1	- 26,000KW
5) Duhabi Multifuel-2	- 13,000KW
Total	**- 55,028KW**

Small Hydropwer (Existing Grid Connected)

1) Pharping xxx	- 500KW
2) Panauti	- 2400KW
3) Sundarijal	- 640KW
4) Fewa	- 1088KW
5) Seti	- 1500KW
6) Tinau	- 1024KW
7) Baglung	- 200KW
8) Tatopani (1+2)	- 2000KW
9) Jomsom xx	- 240KW
10) Chatara	- 3200KW
Total	**- 12,972KW**

Existing (Isolated)

1) Dhankuta	- 240KW
2) Jhupra	- 345KW
3) Doti	- 200KW
4) Phidim xx	- 240KW
5) Gorkha xxx	- 64KW
6) Jumla xx	- 200KW
7) Dhading	- 32KW
8) Syangja xxx	- 80KW
9) Helambu	- 50KW
10) Darchula (I+II)	- 300KW
11) Chame	- 45KW
12) Taplajung xx	- 125KW
13) Manang	- 80KW
14) Chaurjhari xx	- 150KW
15) Syarpudaha xx	- 200KW
16) Khadbari xx	- 250KW
17) Terhathum xx	- 100KW
18) Bhojpur xx	- 250KW
19) Pamechhap	- 150KW
20) Bajura	- 200KW
21) Bajhang xx	- 200KW
22) Arughat	- 150KW
23) Okhaldhunga	- 125KW
24) Rupalgad	- 100KW
25) Surnaiyagad	- 200KW
26) Acham	- 400KW
27) Dolpa	- 200KW
28) Kalikot	- 500KW
Total	**- 5176KW**

Under Construction

1) Gamgad	- 400KW
2) Heldang	- 500KW
Total	**- 900KW**

Note:

xx - Leased to be private sector

xxx - Not in normal operation

Private Sector Plant

Existing

1) Aadhikhola (BPL)	- 5,100KW
2) Jhimruk (BPL)	- 12,000KW
3) Khimti (HPL)	- 60,000KW
4) Bhotekoshi (BKPL)	- 36,000KW
5) Sangakhola (SHP)	- 183KW
6) Indrawati (HHPC)	- 7,500KW
7) Chilime (CPC)	- 20,000KW
8) Piluwakhola (AUHP)	- 3,000KW
9) Chaku Khola (APCO)	- 1,500KW
10) Sunkoshi Small (SHP)	- 2,500KW
11) Rairang (RHPD)	- 50KW
12) Sallari (SCEW)	- 400KW
13) Namche	- 600KW
14) Khudi (KHP)	- 3,450KW
Total	**- 1,52,733KW**

Under Construction

1) Sisnekhola (GBHP)	- 750KW
2) Baramchi (UH)	- 999KW
3) Thopalkhola (THP)	- 1,400KW
4) Phemekhola (KHP)	- 995KW
5) Lower Hyadi (BHP)	- 4,500KW
6) Lower Indrawati (SHP)	- 4,500KW
7) Salinadi (KSH SPL)	- 232KW
Total	**- 12,376KW**

Solar Power

1) Simikot	- 50KW
2) Gamgadhi	- 50KW
Total	**- 100KW**

Transmission Line Length

1) 132kV Transmission line	- 2,076 ckt km
2) 66kV Transmission line	- 586 ckt km
3) 66kV Underground cable	- 7 ckt km
4) 33kV Single circuit	- 2,485 ckt km

Substation Capacity

1) 132/11kV	- 71MVA
2) 132/33kV	- 358MVA
3) 132/66kV	- 211MVA
4) 66/11kV	- 424MVA
5) 66/33kV	- 25MVA
Total	**- 1089 MVA**

Installed Capacity of Nepal

Electricity Authority (Including Private and others) – 614.979 MW

Cofficient of Correlation between Current Assets and Current Liabilities of NEA

Rs. In million

Year	Current Assets(x)	Current Liabilities(Y)	X(x-x')	Y(y-y')	$X^2(x-x')^2$	$Y^2 (y-y')^2$	XY(x-x')(y-y')
1997	4868.60	2925.20	-1338.55	-4761.40	3757976.10	22670929.96	3230211.97
1998	5692.20	4005.00	-1114.95	-3681.60	1243113.50	13554178.56	423199.92
1999	5053.20	4786.50	-1753.95	-2900.10	3076340.60	8410580.01	5086630.39
2000	5761.10	5477.40	-1046.05	-2209.20	1094220.60	4880564.64	2310933.66
2001	6313.60	6113.70	-493.55	-1572.90	243591.60	2474014.41	776304.79
2002	7322.00	5948.10	514.85	-1738.50	265070.52	3022382.25	-895066.72
2003	7690.50	8198.10	883.35	511.50	780307.22	261632.25	451833.52
2004	7883.40	10389.20	1076.25	2702.60	1158314.06	7304046.76	2908673.25
2005	8491.60	13317.50	1684.45	5630.90	2837371.80	31707034.81	3484969.50
2006	8995.30	15705.30	2188.15	8018.70	4788000.42	64299549.69	17546118.41
N= 10	ϕx= 68071.50	ϕy=76866.00	ϕX=0	ϕY=0	$\phi(x-x')^2$= 19244306.42	$\phi(y-y')^2$ = 34285363.65	$\phi(x-x')(y-y')$ =35323808.69
	X'=6807.15	Y'=7686.60					

We have,

N = 10 Years
x' = x/n = 6807.15
y' = y/n = 7686.60
$(x-x') = 0$
$(y-y') = 0$
$(x-x')^2 = 19244306.42$
$(y-y')^2 = 34285363.65$
$(x-x')(y-y') = 35323808.69$

Using Karl Persion's Formula

$$r = \frac{(x-x')(y-y')}{(x-x')^2 \times (y-y')^2}$$

$$\text{or, } r = \frac{35323808.69}{}$$

$$\text{or, } r = \frac{19244306.42 \times 34285363.65}{35323808.69}$$
$$25686534.29$$

or, r = 1.375

Then,

$$\text{Per} = \frac{1 - r^2}{N}$$

$$\text{Per} = \frac{1 - (1.375)^2}{10}$$

$$\text{Per} = \frac{0.89}{10}$$

Per = -0.281

The Regression analysis between sales and Net Profit

Let, x' = Average sales (Rs. in Million)

y' = Average net profit (Rs. in Million)

y = a + bx

be a mode which explains the linear relationship between x and y

we have,

$$b = \frac{xy - nx'y'}{x^2 - n(x')^2}$$

a = y' – bx' …….. (i)

Annex-3

Calculation of Line of Best Fit

Rs. In million

Year	x	Y	xy	x^2
1997	4767.30	1027.80	4899830.94	22727149.29
1998	5082.50	1181.50	6004973.75	25831806.25
1999	5396.70	1065.50	5750183.85	29124370.89
2000	6856.00	1230.60	8436993.60	47004736.00
2001	8160.80	1159.60	9463263.68	66598656.64
2002	9476.20	278.90	2642912.18	89798366.44
2003	11012.60	-1694.90	-18665255.74	121277358.80
2004	11874.80	-3475.20	-41267304.96	141010875.00
2005	12605.20	-4808.00	-60605801.60	158891067.00
2006	13331.90	-6095.80	-81268596.02	177739557.60
N= 10	ϕx= 88564.00	ϕy=10130.00	ϕxy=164608800.30	ϕx^2= 880003943.91

$x' = \frac{x}{n} = \frac{88564.00}{10} = 8856.40$

$y' = \frac{y}{n} = \frac{10130.00}{10} = -1013.00$

$b = \frac{xy - nx'y'}{x^2 - n(x')^2} = \frac{-164608800.30 - 10 \times 8856.40 \times (-1013.00)}{880003943.91 - 10\,(8856.40)^2}$

$= \frac{-164608800.30 + 89715332.00}{880003943.91 - 784358209.60}$

$= \frac{-74893468.30}{35645734.30}$

$b = -2.10$

Replacing the value of b in equation (i)

$a = y' - bx'$

$= -1013 - (-2.10)8856.40$

= -1013 +18598.44

= 17585.44

Then, the line of best fit is

$y = a + bx$

$y = 17585.44 + (-2.10)x$

$y = 17585.44 – 2.10x$

The regression analysis between sales & operating expenses

Let, x' = Average sales (Rs. in Million)

y' = Average operating expenses (Rs. in Million)

$y = a + bx$

be a mode which explains the linear relationship between x and y

we have,

$$b = \frac{xy - nx'y'}{x^2 - n(x')^2}$$

$a = y' – bx’$ …….. (i)

Annex-4

Calculation of Line of Best Fit

Rs. In million

Year	Revenue x	Operating expenses y	xy	x^2
1997	4767.30	882.00	4204758.60	22727149.29
1998	5082.50	1110.90	5646149.25	25831806.25
1999	5396.70	1229.50	6635242.65	29124370.89
2000	6856.00	1415.00	9701240.00	47004736.00
2001	8160.80	1832.30	14953033.84	66598656.64
2002	9476.20	1621.80	15368501.16	89798366.44
2003	11012.60	1844.70	20314943.22	121277358.80
2004	11874.80	1865.20	22148876.96	141010875.00
2005	12605.20	2160.60	27234795.12	158891067.00
2006	13331.90	2123.20	28306290.08	177739557.60
N= 10	ϕx= 88564.00	ϕy=16085.20	ϕxy=154513830.88	ϕx^2= 880003943.91

$x' = \frac{x}{n} = \frac{88564.00}{10} = 8856.40$

$y' = \frac{y}{n} = \frac{16085.20}{10} = 1608.52$

$b = \frac{xy - nx'y'}{x^2 - n(x')^2} = \frac{154513830.88 - 10 \times 8856.40 \times (-1608.52)}{880003943.91 - 10\ (8856.40)^2}$

$= \frac{12056865.52}{35645734.30}$

b = 0.34

Replacing the value of b in equation (i)

a = y' – bx'

= 1608.52 - 0.34 x 8856.40

= 1608.52 - 3011.18

a = - 1402.66

Then, the line of best fit is

$y = a + bx$

$y = 1402.66 + 0.34x$

The regression analysis between equity & debt

Let, x' = Average equity (Rs. in Million)

y' = Average debt (Rs. in Million)

$y = a + bx$

be a mode which explains the linear relationship between x and y

we have,

$$b = \frac{xy - nx'y'}{x^2 - n(x')^2}$$

$a = y' – bx’$ …….. (i

Annex-4

Calculation of Line of Best Fit

Rs. In million

Year	Equity x	Debt y	xy	x^2
1997	25699.30	17403.20	447250057.76	660454020.49
1998	25788.80	20848.40	537655217.92	665062205.44
1999	25406.10	23824.30	605282548.29	645469917.21
2000	26323.60	30155.70	793806584.52	692931916.96
2001	25853.00	36707.50	948998997.50	668377609.22
2002	24755.10	41474.50	1026705394.95	612814976.01
2003	22561.20	43786.00	387864703.20	509007745.40
2004	22766.50	45252.00	1030229658.00	518313522.30
2005	24987.90	48686.40	1216570895.00	624395146.40
2006	27397.40	50636.80	1387316664.00	750617526.80
N= 10	ϕx= 251538.90	ϕy=358774.80	ϕxy=7454680720.88	ϕx^2= 6347444586.00

$x' = \frac{x}{n} = \frac{251538.90}{10} = 25153.89$

$y' = \frac{y}{n} = \frac{358774.80}{10} = 35877.48$

$b = \frac{xy - nx'y'}{x^2 - n(x')^2} = \frac{7454680720.88 - 10 \times 25153.89 \times 35877.48}{6347444586.00 - 10\ (25153.89)^2}$

$= \frac{4430098866.00}{20262765.00}$

b = 218.63

Replacing the value of b in equation (i)

a = y' – bx'

= 35877.48 - 218.63 x 25153.89

= 35877.48 - 5499394.97

a = - 5463517.49

Then, the line of best fit is

y = a + bx

y = - 5463517.49 + 218.63x

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