Revenue Collections and Sales of

Nepal Electricity Authority

(A case study of Kavrepalanchok District)

A Thesis

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By

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LETTER OF RECOMMENDATION

This is to certify that the thesis entitled "Revenue Collections and Sales of Nepal Electricity Authority; A Case study of Kavrepalanchok District" written and submitted by Mr. Dipak Bhusal has been examined. It has been declared successful for fulfillment of the academic requirements toward the completion of Masters of Arts in Economics. I forward it with recommendation for approval.

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APPROVAL SHEET

The thesis entitled "Revenue Collections and Sales of Nepal Electricity Authority; A Case Study of Kavrepalanchok District" submitted by Mr. Dipak Bhusal to the Department of Economics, Faculty of Humanities and Social Science, Patan Multiple Campus, in the partial fulfillment of the requirements for the Degree of Master of Arts in Economics has been found satisfactory in scope and quality. Therefore we accept this thesis as a part of the said degree.

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ACKNOWLEDGEMENTS

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Abstracts

The study results conclude that there are some major problems affecting the financial performance of NEA kavre but some are general problems, which can be overcome with general considerations. Those problems, which were affecting to a greater extent to the performance of NEA Kavre, were included in the conclusions as major issues and gaps.

There is no effective utilization of assets whether that is current or fixed. The branch has been seriously facing the problem of outstanding debt collection. Therefore account receivable has become burden meaning that average collections periods are also longer in each fiscal year. It was observed that has generated negative profitability throughout the study period. The capacity of assets in the generation of revenue is not satisfactory and the revenue is very low in comparison to the investment made. Increasing cost in every fiscal year is an important issue. It has not adopted the cost control tools and techniques. Electricity leakage, theft and wastage have been the major reasons educing the profit earning capacity.

Based on the major findings of the study of performance of kavre branch, some suggestions have been recommended in this part. It is hoped that these recommendations will prove to be useful to management of the branch.

(1) Revenue accounting should be given adequate importance like expenditure accounting by budget center chiefs and responsible personnel should be appointed to handle this section. (2) It can be suggest them to create a healthy working environment and environment of mutual trust and mutual co-operation. (3)The board of directors should be free in setting the strategic as well as formulating policies. (4) For the improvement on performance of the branch, the interference should minimize. (5) All the staffs of the organization are not well trained which is the main reason for over staffing. (6) It should reduce the loss arose out of leakage outage and theft of electricity. (7)The central level should undertake regular inspection and monitoring visit of budget centers.

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Fiscal Year Translated

2001A.D	2057/2058 B.S
2002 A.D	2058/2059 B.S
2003 A.D	2059/2060 B.S
2004 A.D	2060/2061 B.S
2005 A.D	2061/2062 B.S
2006 A.D	2062/2063 B.S
2007 A.D	2063/2064 B.S

ABBREVIATIONS

ACP:	Average Collection Period
BR:	Bills Receivable
BP:	Bills Payable.
Branch:	Kavre Branch / Kavre Distribution Centre
CA:	Current Assets
FY:	Fiscal Year
HMG/N:	His Majesty's Governments of Nepal
I.e.:	That is
NEA:	Nepal Electricity Authority
NEA Kavre:	Nepal Electricity Authority Kavre District
NPC:	National Planning Commission
PES:	Public Enterprises
QA:	Quick assets
SWOT:	Strengths Weaknesses Opportunities and Threats
TFA:	Total Fixed Assets
WSSC:	Water Supply and Sewage Corporation

CHAPTER - ONE
INTRODUCTION

1.1 What is a Public Enterprise?

Different types of organizations provide different services to their customers. Some are manufacturing firms and some are service- oriented organizations. Mainly customers get services from private sector and public sector. A public enterprise is owned and managed by the government. It provides goods or services for a price. Public enterprise has a significant role in almost every country of the world, yet there has so far been no standard definition of its own. The term 'Public Enterprise' has been defined differently by different agencies and governments to suit their own respective situation. "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 enterprise in stimulating and augmenting the pace of economic growth in developing countries can hardly is under estimated.

"Public enterprise plays a very important role in most of developing countries. The role of public enterprise differs from country to country, basically due to political philosophy of existing governments. Public enterprise comes in to existence either by the way of deliberate policy of the government to bring certain activities under new institution or by nationalizing them from private sector. When we see the history of PE, we find that most of them well created by the government themselves to manage certain key sectors of the economy".

1.2 Public Enterprises in Nepal

Public enterprise in Nepal constitutes a vital instrument for the socio-economy development of the country. It enjoys a strategic and crucial position in our mixed economy. Public enterprises (PEs) have been established in many sectors for the overall development of the country with different goals and objectives." Nepal Bank Limited (1937 A.D), a commercial bank was the first

PE to have separate legal status in Nepal". During the World War 2nd, 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 year plan. Since then, the number of PEs has increased substantially in various fields of the nationally economy. There were 64 PEs before the privatization program of Nepal Government and now, there are 43 PEs. The PES is dominant in the production of sugar, cement, cigarettes, agriculture tools, petroleum products and all public utilities. Public enterprises of Nepal can be categories as follows:-

Statutory Corporation
Government companies
Departmental undertakings

Among 43 existing PES, there are three public utility PES namely

- ❖ Nepal Telecom Ltd.
- ❖ Nepal Water Supply Corporation
- ❖ Nepal Electricity Authority.

1.3 Historical Background of Nepal Electricity Authority

Nepal has predominantly an agricultural economy and about 90 percent of the economically active population is engaged in agriculture. Still 91 percent of energy need of the country is met by the traditional energy sources such as fuel, wood, agri-residue and animal dung. Though the total area covered by the national grid system of the country reached 33 percent so far only 15 percent out of the 23.4 million populations has access to electricity. NEA, established little over two decades ago, has been enriched with the mixed experiences of being a successful PE.

NEA is a service oriented PE. The first hydroelectric project started under NEA was built in 1911 A.D at Pharping. Since then, the development of power projects were under taken by agencies called the Bijuli Adda (Department of Electricity) depending upon the prevailing name of the H.M.G /Nepal institution responsible for building power projects in Nepal. Presently NEA and the Department of Electricity Development are engaged in the development of power project in Nepal in the government sector. In 1974 A.D a separate electricity corporation called Eastern Zonal Electricity Corporation was established in Biratnagar to facilitate electricity supply to the eastern part of Nepal. In 1982 A.D. however, Nepal Electricity Corporation and Eastern Zonal Electricity Corporation were merged into a single organization. These different types of organizations working on the same service naturally entailed two-way expenditures and impediments were felt in handling administrative works. Thus, gradually the need for a unified organization started to be felt which could supply and distribute electricity service without much administrative hindrances. To this effect, Nepal Electricity Authority Act 1984 was brought forward and put into effect from 17 August 1985. According to new NEA Act 1984, all former divisions and committees concerning electricity production and supply and distribution were merged into Nepal Electricity Authority. Later on, Marshyangdi Electricity Centre was also handed over to Nepal Electricity Authority after the completion of its construction work.

More specifically, the objectives for establishing Nepal Electricity Authority can be traced as follows:

- ❖ To establish a single organization that would work in all sector of electricity planning, survey, production, operation, maintenance and distribution of electricity.
- ❖ To utilize and develop the huge amount of water resources of Nepal in more coordinated way.
- ❖ To provide equal and extensive skill development opportunities for all employees working in the field of electricity.
- ❖ To overcome the duplication of works being practiced formerly by the existence of several electricity agencies.

The demand for electricity in Nepal both for domestic and industrial consumption is rapidly increasing. In order to meet the increasing demand, NEA has attempted to fix its long-term, mid-term and short-term plans. The short-term plans are identified as medium size hydro electricity projects (5-50 MW) such as Bhote Kosi, Modikhola, Puwa Khola and Khimti projects along with thermal generation with their relatively short gestation period and peaking capabilities. Participation of private sector is also identified as catalyst in the attainment of these goals and has been encouraged by government favorable acts and electricity acts. The mid term option has been identified as Hydro Power generation such as Kali Gandaki.

This is the semi-government institution. The board of the directors is comitituted established by the government. That committee operates those activities which are held in the institution. There are eight members in the Board including the minister for water resource. The Head Office of the NEA is at Durbarmarga, Katmandu.

Mainly, NEA has three sectors namely

- ❖ Generation
- ❖ Transmission
- ❖ Distribution
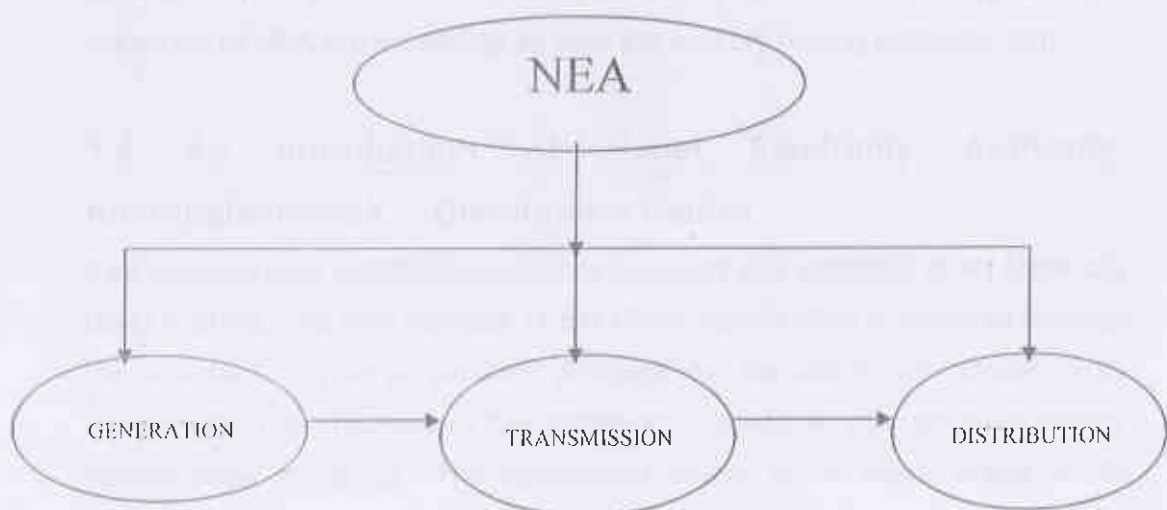
objectives, the utility organizations, distribution sector must devote its full efforts towards prompt revenue collection system, effective system losses reduction programs, restricted use of materials for operation and maintenance purpose and implementation of cost effective system expansion programmes. The distribution managers are required to work with a profit center concept for achieving better economic results of the institution by maintaining proper standards or services to its clients. By the concept of distribution center NEA Kavrepalanchwok branch became NEA Kavrepalanchwok distribution centre in 2004 A.D Before 2004A.D NEA Kavrepalanchwok branch was fully operated by central management after the published of distribution center act 2003A.D the branch has get some rights and authority.

Nepal Electricity Authority, Kavrepalanchwok Distribution Centre is one of the small distribution centers of Nepal Electricity Authority. It is located approximately 27 km east of Katmandu This branch was established in 1986 A.D .Before 1986 those tasks which were held in Kavrepalanchwok district, were operated by Bhaktapur branch. When the required quantity of the consumer were fulfilled in Kavrepalanchwok district NEA Kavrepalanchwok branch Banepa established. After the establishment of branch it started its work over the entire Kavrepalanchwok district. Since the establishment of the branch it is serving its customers.

In the beginning the branch provided its service to about 8000 consumers but currently it is dealing with about 36000 consumers. It shows the electrification in the district is in the increasing trend. By the electrification map it shows that the branch is successful to spread the electricity only to 41% of the total area of Kavrepalanchwok district. So the demand for electricity both for domestic and industrial consumption is rapidly increasing. In order to provide sufficient services to the consumers, Kavrepalanchwok branch has operating its 9 sub branch over the entire district.

As other branches, the Kavrepalanchwok branch has some particular aims and tasks.

- ❖ Reduction of system losses to a reasonable limit
- ❖ Increase of sales for achieving higher rate of revenue collection

- ❖ Implementation of cost effective system expansion scheme for increasing number of consumer.
- ❖ Reduction of operation and maintenance cost.

Beside these aims, it is very difficult for the branch to operate its works, because of the political obstacles, consumer's behavior, etc.

1.5 Statement of the Problem

Nepal is the one of the least developed countries and it has poor economy. Due to its economic conditions and from other causes private sector as well as public sector is not successful to obtain its goal. Mainly some public sector organizations are suffering from the financial problem because of inefficiency, poor performance, political situation and geographic situation. So, there is a requirement of good performance. Lower performance will affect the economic condition of country and the organizations also.

Electricity is one of the basic infrastructures for the industrial development of the nation. Without electricity, industrialization cannot be imagined. In this context NEA has a great role to play for them. For PEs it has no difficulty in selling its products and services as demand of electricity in the nation exceeds supply many times. It has been facing or no market competition, enjoying almost full monopoly over the distribution of service. Despite these facts, the performance of NEA has remained unsatisfactory and quite poor. NEA Kavrepalanchwok Distribution Centre is providing its service to whole Kavrepalanchwok district. It has a great contribution to our country. So, this branch is considered as back bone of Kavrepalanchwok district.

The branch has been facing different problems due to the political situation of the country. Now days, the performance of this branch is in decreasing trend and can not able to grab opportunities. This research about relationship between sales and revenue collection of Kavrepalanchwok branch will focus and provide clear vision regarding financial problem, strategic implementation and tactful plan of the NEA Kavrepalanchwok.

This study is confine to the problem of the behavior of the financial operation of NEA Kavrepalanchwok Branch. As observation of financial performance in

NEA Kavrepalanchwok does not seem to be satisfactory and encouraging despite its monopoly to the power sector of the district.

1.6 Significance of the Study

Financial performance decision is a significant managerial decision. Over the past 21 years, the branch has covered 41% of the district, in the way it has to face many problems. The major problem of the branch has been to collect revenue. This research focuses the relation of sales and revenue of the NEA Kavrepalanchwok. How does this relation affect the branch's output? Study made on NEA Kavrepalanchwok analyzes the financial situation and problems of the branch

This study properly analyzes the data, provides recommendation of financial affairs, and provides conclusions in particular to the NEA, Kavrepalanchwok branch. It discusses the relationship between sales and revenue collection of a branch. So it provides the sound financial planning idea, measure for corrective action, useful feedback to the branch and other stakeholders.
This study is believed to be an important effort to identify the actual trend of financial performance of NEA Kavrepalanchwok and is expected to provide some appropriate measure to solve financial problems of the Branch.

1.7 Objectives of the Study

The basic objective of this study is to analyze the relationship between sales and revenue collection of NEA Kavrepalanchwok Distribution Centre.

The specific objectives of the study have been the following:
- ❖ To analyze the financial performance of the NEA Kavrepalanchwok.
- ❖ To conduct SWOT analysis of NEA, Kavrepalanchwok.
- ❖ To suggest for the improvement of financial performance of NEA in order to improve financial performance.

1.8 Limitations of the Study

Some of the limitations relating to the study are as follows:-

* ❖ Limited data set: In absence of sufficient information, the study will covered only seven fiscal years i.e. from 2001 to 2007 A.D.
* ❖ Due to the time constraints, not all the related areas have been covered in depth.

1.9 Organization of the Study

This study has following five chapters. Titles of the chapters are as following

1. Introduction:

This chapter is organized as background, theoretical background, focus of the study, profile, statement of the problem, objective of the study, and importance of the study, limitation of the study.

2. Review of literature:

This chapter is about review of various related books, journals, other publications.

3. Research methodology:

In this chapter, several tools and techniques are explained for the analysis and defined properly for the presentation of data.

4. Presentation and analysis of data:

This chapter consists of tabulation, presentation and analysis of data. It also includes the calculation of financial and statistical tools. Major findings are also included in this chapter.

5. Summary, Conclusion and Recommendations:

This is the last chapter about suggestions to the Branch that will help to improve its performance.

Bibliography and annexes have been attached at the end of the thesis.

CHAPTER - TWO
REVIEW OF LITERATURE

2.1 General Background

In this chapter, the review of various books, research studies and articles have been made to make clear about the concept of Sales and revenue collection of NEA. Literature review is basically a 'stock taking' work of available literature. So, it provides required depth of knowledge for conducting research. The purpose of literature review is thus to find out what principles are established and research studies have been conducted in the field of study, and what remains to be done.

To make meaningful research study, the conceptual review has been done through the study of various books and articles. In addition, references have been drawn from former researches including Master thesis, dissertation papers, and so on in relation to NEA. So, this chapter 'Literature Review' has been divided into the following two sections.

A. Conceptual framework
B. Review of previous study

For the review purpose, the researcher has undergone conceptual aspects and different relevant pilot works. Therefore, the objectives of this chapter are to provide the essential knowledge of financial performance, financial statements and tools of financial statements analysis. Textual support and pilot studies are presented as follows.

2.2 Textual Supports

   ❖ Financial Statements of sales and collection
   ❖ Analysis and Interpretation of sales and collection
   ❖ Tools of Financial Statement Analysis.

2.2.1 Financial statements of sales and revenue collection:

"Financial statements depict the actual position of a firm in terms of monetary value at a particular point of time. Financial statement such as income statement and balance sheet are the two most important statements that business firms prepare at regular intervals. The basic financial statements prepared for the purpose of reporting in NEA are: (I) Balance sheet or statement of financial position (ii) Profit and loss account (iii) Statements of sales and Collection (IV) Loss Report etc. These statements are contained in a NEA's annual report. The main internal source of NEA is the amount received through electricity sales that remains with it after deducting the cash expenses. Out of the total amount, provision has to be made for working capital requirement. The balance amount remaining thereafter becomes available for NEA investments. In order to suffice the investments, NEA tariff level should be at a level sufficient to generate sales revenue covering cash operating expenses, working capital requirement, debt servicing as well as financing requirement of the investment program.

One of the strategies to improve its revenue base is to increase its sales volume through utilization of available surplus energy and generate additional revenue. Domestic as well as export to potential market for sale of this available energy could add to the revenue base. Seasonal tariff is one of the alternatives to promote consumption in domestic market. Accordingly, NEA had made proposal for seasonal tariff in the past, which did not materialize for various reasons. Energy export to Indian market has been considered as the next acceptable alternative for this purpose and therefore, NEA is negotiating with Power Trading Corporation (PTC) of India.

2.2.1.1 Related factors of the relationship between sales and revenue collection:

- ❖ Electricity Sales
- ❖ Revenue Collection from sales
- ❖ Revenue Collection from other income
- ❖ Electricity Loss Reduction

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2.2.1.2 Objectives of financial statements:

Financial statements are prepared from the accounting records maintain by the organization. The generally accepted accounting principles and procedures are followed to prepare these statements, As stated earlier, the basic objective of financial statement is to assist in decision - making. The other objectives are:

Resources and Obligations: To provide reliable financial information about economic resources and obligation of business enterprises.

Changes in net resources: To provide reliable information about changes in net resources (resources minus obligations) of an enterprise that results from the profit-directed and other activities.

Earnings potential: To provide financial information that assists in estimating the earnings potential of the enterprises.

Full disclosure: To disclose, to the extent possible, other information related to the financial statement that is relevant to statement users.

2.2.2 Financial statements analysis of sales and revenue collection:

The terms financial statements refer to the main two statements - (I) balance sheet or statement of financial position (ii) profit and loss account (iii) Statements of sales and Collection (iv) **Loss Report** etc, which the accountant prepares at the end of the period of time for a corporation. Financial statements provide the summary of the accounts of business enterprises. The balance sheet reflects the assets, liabilities as of certain date. The income statements show the results of the operations during the certain period. The sales and collection statements provided the information about sale, collection and debtors and loss report.

Financial statement analysis refers the indication of proportionate relationship of various components of statement with aggregate figures, proportion within them in the same period and proportional changes from one year to another.

a. Balance sheet:

Balance sheet is important component of financial statement. It is the mirror of the financial position of the firm at a particulars date. Balance sheet is the fundamental accounting report. According to I.M Pander, balance sheet contains information about the resources and obligation of a business entity and about its owner's interest in a business at a particular point of time. In accounting language balance sheet communicates information about the assets, liabilities and owner's equity for the business firm as on specific date. It provides snapshots of financial position of the firm at the close of firm's accounting period. It also indicates the resultant outcome of the firms investment, along with financial and dividend decision.

b. Profit and loss account:

Profit and loss account is major statement of financial information. It shows the result of trading and non- trading operations during a period of time. It presents the summary of revenue earned and costs incurred earning this revenue in a comparative form. The different is the net profit or net loss. In operational terms, the accounting report that summarizes the revenue items, the expense items and difference between them for an accounting period is called the income statement.

Thus, income statement reflects the efficiency of the firm. However, it may not be the true representative of the efficiency. The income statement is the reflection of the firm's performance during the particular period of time. Income statement occupies a significant place in portraying the result of business operation.

c. Statements of sales and collection

Here statements of sales and collection mean electricity sales and collection in NEA this statement shows the actual position of sales and collection in one fiscal year. It helps to know what amount of sales and collections have been made in different tariffs. This statement also helps to calculate the total debtors of a corporation. The main internal source of NEA is the amount received through electricity sales so it has major role in the corporation.

d. Loss report

AS well as the sales report loss report of the branch is also very most important factor. It is most important because it the key report of a performance analysis indicator or we can say this report it is the clear image of the branch. It also indicates the received unit of the branch and sales, along with technical loss. Different distribution centre are ranked on the basis of loss report in NEA. This report includes receive unit from the substation (Transmission), sales of electricity which is taken by the consumers. The variation between these two factors is profit / loss. Generally the report always shows loss because sales unit will never exceed received unit. The calculation of the performance is based on the margin of loss. So the name of this report is loss report.

2.2.2.1 Meaning and purposes of financial statements analysis:

Analyzing financial statement is a process of evaluation relationship between component parts of financial statements to obtain a better understanding of a firm's position and performance.

The financial statement of the business enterprises are initiated to provide much to basic data uses for decision making and in general evaluation of performance by various groups such as current owners, potential investors creditors, Government agencies and some interested competitors Because of various natures in published financial statement used for a wide variety of uses, it is often necessary for particular group to extract the information in which they are particularly interested from the statement. For example, owners and potential investors are normally interested in the present earnings, future earnings prospects of business of the similar case may different to the other parties Thus the detailed analysis and interpretation of financial statement is usually required in order to obtain the information which may be relevant for the specific prospects of particular user

2.2.2.2 Methods and procedures of financial statement analysis:

One of the valuable aids we find is the ratio analysis with which a financial manager or a creditor may evaluate how a firm uses different factors may determine how these uses are financed. In addition to studying past flows, the analyst can evaluate future flows by means of a funds statement based on forecasts. Such a statement provides on efficient methods for the financial manger to assess the growth of the firm and its resulting financial needs as well as to determine the best way in which to finance those needs. In particular, funds statements are very useful in planning intermediate and long-term financing

In the analysis of projected funds flows, we have the cash budget and pro-forma statements. The cash budget is indispensable to the financial manager in determining the short-term cash needs of the firm and, accordingly, in planning its short-term financing. When cash budget is extended to include a range of possible outcomes, the financial manger can evaluate the business risk and liquidity of the firm and plan a realistic margin of safety. This margin of safety might come from adjusting the firm's liquidity cushion, rearranging the maturity structure of its debt, arranging the line of credit with a bank, or a combination of the multiple cash budgets prepared for a range of possible outcomes are valuable also in appraising the ability of the firm to adjust to unexpected changes in cash flows. The preparation of pro-forma balance sheets and income statement's enables the financial manger to analyze the effect of various policy decisions on the future financial condition and performance of the firm.

The financial method of analysis involves sustainable growth modeling. Here we determine whether the sales growth objectives of the company are consistent with its operating efficiency and with its financial ratios. This powerful tool of analysis allows us to simulate the likely effects of changes in target ratios when we move from a steady state environment.

The following procedures can be used to analysis the financial statements.

1. Percentage increases and decreases in an item in comparative financial statements.
2. Percentage relationship in an individual component to an aggregate total in a single financial statement.
3. Ratios of one amount to another in the financial statement.

These above mentioned methods can be applied by various ways i.e. horizontal analysis, vertical analysis and common size statement analysis etc.

2.3   Review of Previous Research Studies

Previous studies are reviewed in this section.   It consists of thesis and dissertations of previous Master's Level student as well as other research works related to the Sales and Collection of NEA Kavrepalanchwok.

 Analytical studies of an enterprises pertaining to the financial position are essential to know their profit potentiality, operative efficiency and decision-making technique.

Some available research studies relating to the financial aspect of PEs in Nepal have been reviewed in this chapter.

In the study, it was found that "the main criteria for providing financial assistance by HMG/N was not based on normal corporate portfolio structure and needs, but on crisis policy of adequate working capital that play instrumental in bringing about a circular consolation of property in many PEs. Absence of sufficient equity cushions had fed to the poor performance of many PEs. PEs capital structure (debt. to equity ratio) did not follow industry's norms, generally, PEs established with foreign assistance had too much equity where as those established by HMG/N were loaded with debt. It was mentioned in the study that, the evaluation of financial results with a view of taking corrective actions, but was hardly attempted. Periodic review of the budget development of internal system and analysis of the generation of fund and its investment, cash and working capital management were generally poorly conducted in the most PEs in Nepal. Often this leads to a situation where the management was not aware of the real financial position of the undertakings. It was also pointed out that the financial performance of most of PEs was poor.

A thesis was submitted to Institute of Business Administration, Commerce and Public Administration, T.U. by Om Krishna Shrestha on "A financial performance evaluation study of Nepal Electricity Corporation" in 1979 (with special reference to finance aspect). The basic objectives of this study were to evaluate the financial performance of NEA, to suggest measures for the improvement of the performance of NEA and to assess the financial position of NEA. The study covered seven years period i.e. from the FY 1970-71 to 1976-77. In this study he found that NEA has highly fluctuating, funds were mainly collected through share capital, loans, and depreciation funds were mainly used in expanding fixed assets and the contribution of NEC to national economy in the form of value added was increasing. He concluded that the net working capital position was not satisfactory. Operation ratio was unsatisfactory due to high operating expenses, the position of funds collection was in heavily fluctuant. The trend was satisfactory mainly from utilization point of views. He also pointed out that the contribution to the national economy in the form of value added was noticeable, pricing structure had noticeable impact on the profitability situation, impact of power generation and revenue generation on profitability was poor and no control measure was in operation at NEC.

A study in the comparative financial analysis of Water Supply and Sewerage Corporation and Nepal Electricity Corporation" was conducted by Purna Prashad Shrestha in 1998 with the object of individual and comparative financial analysis of water supply and sewerage corporation (WSSC) and Nepal Electricity Authority to identify the finical weakness and strength of these public Enterprise. It was revealed by the study that the liquidity position of both the enterprises was deteriorating and the liquidity of current assets was poor due to excessive inventory holdings. The liquidity position of NEA was worse then that of WSSC. The capital structures of both companies were low geared and NEA enjoyed more favorable position to secure debts than WSSC. The turnover ratio of both enterprises were extremely low, the case in NEA was little better than WSSC. Most of the funds were found spent on the acquisition of fixed assents in case of both enterprises. However NEA spent more funds for this purpose on an average.

Rabindra Dev Bhatta's research "An Evaluation of Financial position of NEA" in 1997 had the following finding and recommendations.

- ❖ There is no effective utilization of assets in NEA.
- ❖ NEA has been seriously facing the problem on the collection of receivable. The accounts receivable in NEA is high. So average collection period is also high in each fiscal year.
- ❖ NEA has generated very low returns and in some years negative profitability throughout the study period.
- ❖ The capacity of assets in the generation of revenue is not satisfactory and the revenue earned is very low in comparison to investment made in the assets of NEA
- ❖ Increasing cost in each fiscal year is an important issue of NEA. It has not adopted the cost control tools and techniques.
- ❖ NEA is not able to fulfill the requirement of funds from internal sources by successful operation of the corporation's activities. It has been taking considerable amount of loan to fulfill the requirements of funds.
- ❖ Electricity leakage, theft and wastage have been the major reasons reducing the profit earning capacity of NEA.
- ❖ High maintenance expenditures as shown in the profit and loss accounts have been an important factor in reducing the profitability of NEA.

Recommendations of Bhatta's researches are:

- ❖ Improvement of the liquidity position.
- ❖ Management of operating as well as non-operating expenses.
- ❖ Development of efficient system of revenue collection.
- ❖ NEA should prepare highly qualified, dynamic and energetic personnel.
- ❖ Reduce over staffing provide training to staff to increase their productivity.
- ❖ Immediate action should be taken.
- ❖ More autonomy should be provided.
- ❖ Efficient utilization of fixed assets.

- ❖ Make investment in small projects and avoid big projects without prior feasibility analysis in terms of finance and corporation cost benefits.
- ❖ The capacity should be fully utilized.
- ❖ The financial position of the corporation should be timely evaluated.
- ❖ Improvements in the present Accounting system.

"An analysis of different performance of the branch" was done by the asst. engineer Sunil Shrestha Kavrepalanchwok Distribution Centre in F/Y 2006.2007. NEA Kavrepalanchwok distribution centre is located approximately 27 km east of Katmandu at Banepa which is business centre of the entire district. It was established in 1986 A.D after the establishment of the branch it started its operation with 8000 consumers. At present it has approximately 36000 consumers. It employs 128 regular staffs. To provide the sufficient service the branch has established 9 sub branch through out district. The branch consists of following three main departments.

     1. Administration Department

     2. Account and Revenue Department

     3. Technical Department

Every department has their specific tasks. Without the clear co-ordination between these departments the branch is unable to run its activities.
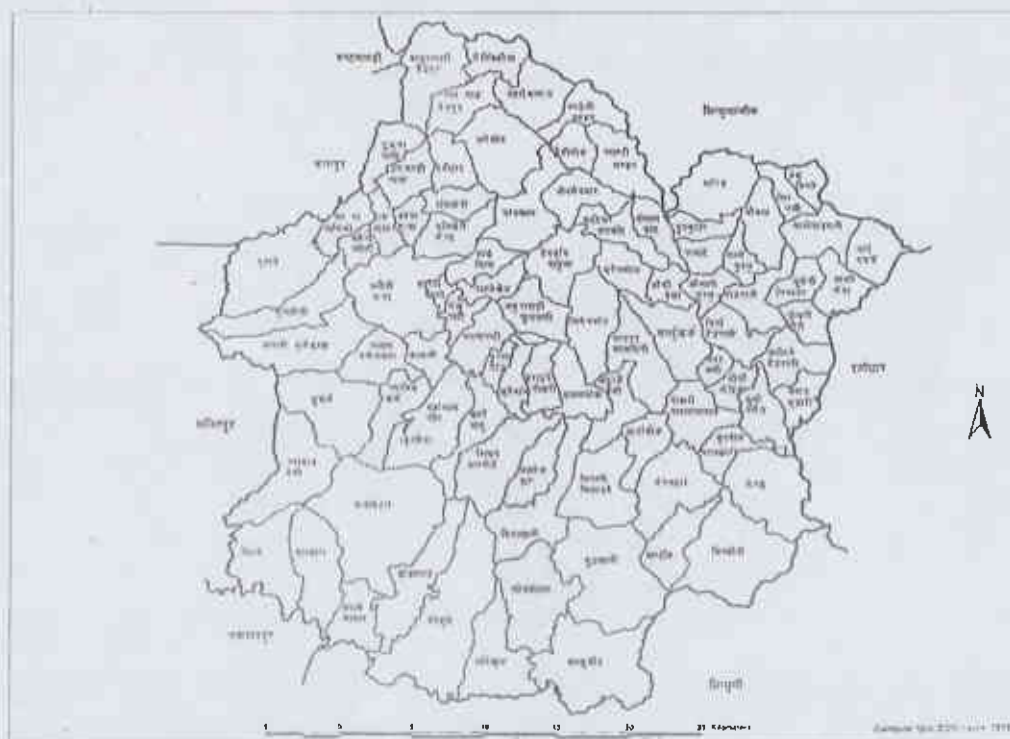
According to the map about 41% area of the district is electrified, because the rural area has not been covered. However the branch has been providing its service to the 41% of the district but the feed back is very low in the preceding 5 years. Due to the political situation of the country the branch is unable to extract information's from those places. The main indicator of performance of the branch is revenue collection which is directly affected by the political situation. So from past few years the performance of the branch is not satisfactory. However the branch is handling its duty to an extend it could.

The main findings and recommendations of Sunil Shrestha are as follows:

- Target growth rate in sales revenue is not achieved
- The Branch has not adopted the practice of preparing monthly budget, which is required for planning and control.
- While preparing budget suggestions of employees and sub-branches are ignored.
- Internal consumption is not shown is the account of individual ledger this may helps to reduce the loss of the branch.

- ❖ The demand of the new consumers is rapidly increasing but the efficient manpower is not enough.
- ❖ The ledger keeping is traditional it may cause variation in control account and individual ledger.
- ❖ About Rs. 10, 00, 00,000.00 debtors are out standing the branch is not serious in this case.
- ❖ In total debtors 45% of the amount is due from street light which is increasing by Rs. 7, 50,000.00 every month.
- ❖ It is shown that the Amount of the Received unit is greater than the sales to the consumers.
- ❖ Operating costs have not been controlled effectively.
- ❖ Accounting system is very traditional it should be changed it caused difficult in reporting.
- ❖ Level of inventory is very high About 1, 25, 00000.00 it is very harmful to the performance indicator of the branch.

Recommendations of Mr. Sunil Shrestha's research are:

- ❖ Planners should be properly trained about budgeting and revenue planning
- ❖ To achieve target growth rate in sales revenue the branch should make realistic forecasts.
- ❖ It should start the practice of preparing monthly budget for sales revenue.
- ❖ The branch should introduce programs and action plans for the reduction of transmission loss, both technical and non-technical. NEA can improve its efficiency in the metering device instantly either by changing old meters or utilizing only efficient meter readers or by improving its transmission system. Non-technical loss can be reduced by adopting effective managerial, social, legal, and other measures.
- ❖ Internal consumption should show in the individual account which helps to reduce the loss
- ❖ In the lack of efficient manpower the branch would not able to provide its service so it should starts different trainings to the staffs.

- ❖ The ledger keeping should be modern it should be computerized.
- ❖ The branch is not serious in the case of the debtors the amount of total debtors is increasing if the branch is not does not take any action it will be very harmful.
- ❖ About Rs. 7,50,0000.00 is outstanding in street light the branch should make communication to the stakeholders.
- ❖ Received unit amount is greater than the sales amount it shows that the branch is in the totally loss it should recognized where is the mistake.
- ❖ Operating cost should be reduced it helps to reduced the loss of the branch.
- ❖ Level of inventory is very high it should reduce.
- ❖ NEA should put more effort to mange the supply to the profitable sectors such as domestic, industrial, non-commercial, commercial and temporary supply.
- ❖ Tariff rate for water supply irrigation, temple, transport service, street light, and bulk supply to India should be revised in such auditor's way that they could cover operating cost at least.
- ❖ NEA should try to reduce overdue amount of receivables. NEA should provide incentive to staff to encourage them for collection of overdue amount of receivable. In revenue collection any kind of pressure, nepotism and biases should strictly be discouraged.
- ❖ An effective cost control program is necessary in NEA.
- ❖ Price cost volume profit relationship should be considered while formulating the revenue plan.
- ❖ NEA should have proper coordination regarding budget formulation, implementation and evaluation of achievement.
- ❖ NEA should try to avoid the load shedding which has created negative attitude towards NEA.

Thus the review of studies clearly pointed out that majority of corporations in our country showed poor performance. The management of PE's does not seem to be satisfactory.

In this studies it is also pointed out that the net worth is artificially kept low they are in dangerous liquidity position. Sales are inadequate and average investment in working capital declined over a period of time. There is less inventory turnover due to high possession of stocks, which is the indicative of inefficient inventory management.

The evaluation and analysis of financial results with a view to take corrective actions were handily made. There is much to do in the employment of analytical tools to study many PEs to evaluate their financial position. There have been quite few attempts to evaluate the financial performance of NEA some one and half decade ago. However, not much attempts were noticed in the recent past. NEA has undergone significantly changes and has become the largest public enterprises in the country in terms of assets, investments and the volume of services provided by it in situation. Therefore, it has been important to evaluate the financial performance of NEA based on current information.

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CHAPTER - THREE
RESEARCH METHODOLOGY

3.1 Introduction

A systematic research study requires a proper methodology to achieve the set objective. This study has also developed the definite methodologies to achieve the set objective. So this chapter has been attempted to present a basic frame of methodology within which the research will be conducted.

Research methodology refers to the various sequential steps along with a rationale, of each such step to be adopted by a researcher in studying a problem with certain objectives. It would be appropriate to mention that research projects are not susceptible to any incomplete and inflexible sequence whereas the type of problems to be studied will determine the particular steps to be taken.

Research is a systematic and organized effort to investigate a specific problem that needs a solution. This process of investigation involves a series of well through out activities of gathering, recording analysis and interpreting the data with the purpose of finding answers to the problem.

Research methodology is the way to solve systematically about the research problem. It consists of the research design, the nature and sources of data, tools used, research variables and research questions.

3.2 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. It is the plan and formulation of investigation idea and strategy so as to obtain answers to research questions and to control variance.

Strategy, as used here, is also more specific than plan. In other words, strategy implies how the research objectives will be reached and how the problems encountered in the research will be tackled.

The plan is the overall scheme on program of research. It includes an outline of what the investigator will do from writing the hypothesis and their operational implication to the final analysis of data. The structure of the research is more specific. It is the outline, the scheme, and the paradigm of the operation of the variables. When we draw diagrams that outline the variables and their relation and juxtaposition we build structural schemes for accomplishing the operational research purpose. Strategy, as used here, is also more specific than plan.

The research design of this study is descriptive as well as analytical. This study is an examination and evaluation performance of NEA Kavrepalanchwok. The study is closely related with the various indicators revealed from the accounting / revenue statements.

In this study, relationship between sales and collection of NEA Kavrepalanchwok is based upon the historical financial activities. To define the relation between these two factors is the main objective of the study.

So, the study is based on certain research designs. This study emphasizes on descriptive and analytical study of collected data over a period of time (Data are taken from NEA's balance sheet and income statement and the analysis is basically made on the basis of these 7 years data) and it gives suggestion on the improvement of the branch's performance. So this study is based on descriptive and analytical research designs.

3.3 Types and Sources of Data

The main source of data for the purpose of this study is the published financial statement of NEA Kavrepalanchwok for the period of last seven years (2001 to 2007). This study is mainly based on the primary as well as secondary data. Such primary data are generated from the branch's different department i.e. distribution center chief, account officer, accountant, store keeper, ledger keeper and other staffs of the branch. The study is not only about the branch

here comparison between entire NEA's performance and Kavrepalanchwok distribution centers performance has been made. So data are also taken from several other sources like government report, bulletin and other published statements of NEA, its magazines and studies made on this subject.

3.4   Data collection Procedure

There are several methods of data collection and they generally fall into primary and secondary. According to selltiz, wrightsman and cook as quoted by Ritchie (1989), the purpose of the various data collection techniques is to produce truth worthily evidence that is relevant to the research question being asked.

For the purpose of this study, following methods are used:

a) **Primary data**: Primary data is that data which is generally collected by the investigator or researcher directly by himself/herself. Descriptive analysis is made with the help of primary data. Primary data are collected by questionnaire and meeting with concern people. To get reliable information discussion was also conducted with staff of Nepal Electricity Authority and other related parties

b) **Secondary data**: Secondary data is the data, which is already collected and used from someone. Secondary data are the data that have been gathered not for the immediate study but for some other purpose. Secondary data can be obtained from either private or public sources. It is collected indirectly. The advantages of secondary data are low in cost and do not require much time to collect. However it has disadvantages such as the data may not fit exactly as per requirement for the research problems as defined in the study.

The secondary data are collected from published accounting statements of Nepal Electricity Authority, report of National Planning Commission, Central Bureaus of Statistic and other sources. The review of theory relating to this study is based on textbooks, official publication, Journals and previous research studies.

3.5 Methods of Analysis

The study has used both descriptive as well as inferential techniques of analysis. Data so obtained have no meaning unless they are arranged and presented in a systematic way. Further, they need to be verified and simplified for the purpose of analysis. Moreover, data and information so gathered are to be checked, edited and tabulated in such ways that provide convenience for computation and interpretation.

The relevant data have been inserted in meaningful tables. Only the data that are relevant to the study have been presented in the tabular form in the understandable way and unnecessary data have been excluded. To achieve the predetermined objective of the research, certain financial and statistical tools are used.

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

a. Related data from secondary sources are selected, grouped and tabulated for the purpose of this study.

b. Primary data collected through questionnaire are tabulated and analyzed by using statistical tools as well as financial.

c. Tabulated secondary data are analyzed by using ratio analysis. With the help of analysis, conclusions were drawn and recommendations were suggested.

3.6 Analytical Tools Used

3.6.1 Ratio Analysis:

Ratio analysis is a widely used tool of financial analysis. Ratio analysis is powerful and important tool and technique of financial analysis, which helps in identifying the health of the organization. In other words ratio analysis helps the analyzer make qualitative judgment on the firm's financial position as well as performance. Ratio analysis is a powerful tool for financial analysis. " Ratio refers to the numerical or qualitative relationship between two variables. A ratio is calculated by dividing one item of the relationship with other". The

primary purpose of ratio is to point out areas of further investigation. Ratio analysis uses a major tool in interpretation and evaluation of financial statement.

Ratio analysis stands for the process of determining and presenting the relationship of items and groups of items in the financial statement. According to Van Horne "to evaluate the financial condition and performance of a firm, the financial analysis needs certain yardsticks. The yardstick frequency used is a ratio or index relating to pieces of financial data to each other.". Ratio is a powerful and important tool and technique of financial analysis, which helps in identifying the financial health of the organization. In other word, ratio helps to find out the firm's financial position as well as performance.

Ratio may be classified in number of ways keeping in the view the particular purpose. There are different about classification of ratio analysis. According to Van Horne "different types of ratios are used in day to day. Generally, four types of ratios namely liquidity, leverage, turnover, and profitability ratios are used in analysis of financial position of a company". 2

A. Liquidity ratios:

Liquidity ratios are used to judge firm's ability to meet short-term obligations at its maturity. Liquidity ratio involves the relationship between current assets and current liabilities. Two ratios are mainly used to measure the liquidity perditions.

    i.   Current Ratio

    ii.   Quick Ratio / Acid Test Ratio

    iii.

I. Current Ratio:

Current ratio is the proportion of current asset to current liabilities, which is computed by dividing current assets by current liabilities.

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

Current assets constitute cash and those assets, which can be converted into cash within a year such as marketable securities, account receivable,

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inventories and prepaid expenses. All the obligations maturing within one year are involved in current liabilities. Higher the current ratio, greater is the probability of timely and full payment of current liability, law ratio indicates that the firm may not be able to pay its current obligations in time.

II. Quick Ratio:

Quick ratio is the proportion of quick assets to current liabilities, which are more accurate measure of liquidity than the current ratio quick asset may be defined as current assets minus inventory and it is calculated as under.

$$\text{Quick Ratio} \quad = \quad \frac{\text{Current Assets - (Inventory + Prepaid Expenses)}}{\text{Current Liabilities}}$$

Investor takes more time to convert cash processing through receivable. Therefore it is excluded from current assets. Higher ratio indicates that firm has excessive quick assets and indicates inefficient management. A low ration is the indictor of difficulties is the timely payment of future bills. Thus the management must be able to maintain.

B. Turnover ratio:

Turnover ratio indicates the speed with which assets are being converted or turned into sales. These ratios are employed to evaluate the efficiency with which the firm manages and utilizes its assets. Turnover ratio involves comparison between high level of sales and investment of various assets account. Following four turnover ratios are used in this study.

i.   Fixed Assets Turnover Ratio.

ii.   Total Assets Turnover Ratio.

iii.   Inventory Turnover Ratio.

iv.   Average Collection Period.

i.   Fixed assets turnover ratio:

Fixed assets turnover ratio measures the efficiency with which the firm is utilizing its investment in its net not fixed assets. It is calculated as:

$$\cdot \text{ Fixed Assets Turn over Ratio} \quad = \quad \frac{\text{Sales}}{\text{Net fixed assets}}$$

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

ii. Total assets turnover ratio:

Total assets turnover ratio indicates the sales generated per rupee of investment in the total assets. This ratio is calculated as under.

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

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

iii. 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 inventory is turning into sales. Generally, high inventory turnover is the indication of good inventory management. But a relatively relation high inventory turnover means low level of inventory which may result frequent stock-out and is costly for the firm.

iv. Average collection period:

The average collection period tells the average number of days that receivables are outstanding, or the average time it takes to convert them into cash. It is computed in two steps:

a. Annual sales are divided by 360 (number of days) in a year to find the average daily sales.

b. Outstanding account receivables is divided by daily credit sales to find out the number of days sales tied-up in receivable.

$$\text{Sales per day} = \frac{\text{Sales}}{\text{Days in years (360)}}$$

$$\text{Average collection period} = \frac{\text{Receivable}}{\text{Sales per day}}$$

Short average collection period shows timely payment by the debtors but it may suggest an excessive and restrictive credit policy of firm, which may result decrease in sales volume. Long average collection period indicates inefficiency of the firm in the collection of receivables, though it may boost up the volume of sales.

C.   Profitability ratios:

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 ratio can be classified into following major types.

I.   Net Profit Margin
II.   Operating Expenses Ratio
III.   Return on Total Assets

i.   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 firm's profit after interest and taxes. The ratio measures the form's ability to change each rupee of 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.

ii.   Operating expenses ratio:

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

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

Operating expenses constitute administration and selling expenses excluding interests. The ratios present the relationship between operating expenses and sale. In general, higher operating ratio tells 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 meat interest, dividend and other expenses of the firm.

iii.   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 of its investments including the lenders fund. 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 level rate of return.

3.6.2 Correlation Co- efficient (r):

The correlation co- efficient is denoted by 'r' and indicates the direction of relationship between variables. In other words, correlation is the relationship between (or among) two or more variables (only one variable dependent and one or more variable (s) independent). Correlation analysis is defined as the statistical technique which measure the degree of relationship (or association) between / among the variables. Correlation analysis does not tell any thing about cause and effect relationship. There are three types of correlation: simple, partial and multiple. But our concern is only with simple correlation. A method of measuring correlation is called ' Pearson's coefficient of

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correlation'. The correlation co- efficient can be calculated by using the following formula under Karl Pearson's method.

$$r = \frac{N\Sigma XY - \Sigma X \, \Sigma Y}{\sqrt{N \, \Sigma X^2 - (\Sigma X)^2} \times \sqrt{N \, \Sigma Y^2 - (\Sigma Y)^2}}$$

Where,

N = number of observations.

X and Y are variables.

The value of correlation coefficient ranges from −1 to +1.

If r = 0, there is no relationship the variables.

If r = 1 correlation is perfectly positive.

If r = -1 correlation is perfectly negative.

Closer the value of r +1 to −1, the higher the relationship between the variables and vice versa.

3.6.3 Regression analysis:

Regression analysis provides certain insights into how to plan the data. It establishes the functional relationship between the variables of ones interest.

Y = a + bx is the purposed relationship. Then utilizing, principal of least square, minimize the sum of the squares of errors, error is the different between observed value and estimated value. The estimates of 'a' and 'b' are,

b =........................ (1)

And

$\overline{a}$ =.......................... (2)

Then the fitted regression model

$Y = \overline{a} \mp \overline{bx}$

Where,

X=the cause (or independent) variables,

Y= the effect (Or depended) variables,

a= the Y- intercept (the value of Y when X=0) and

b= the regression coefficient of Y on X (the rates of changes of Y with respect to)

3.6.4 Average:

Average is the sum of all the observations divided by the number of observations. Average is a single value within the range of the data that is used to represent all of the values in the series. Since an average is some where within the range of the data, it is sometimes called a measure of central value? Average is calculated by the dividing the sum of the observations with number of observations. The huge and unwieldy masses of data are confusing and difficult to remember, so we need a unique value representing them. The averages are the measures which condense a huge mass of data into single value representing the whole data. Averages are the typical values which lie between two extreme observation of the entire data and give us the idea about the concentration of the values in the central part of the distribution.

3.6.5 Graphs:

Graph helps to show the general trend of the ratios in respect to the time period a very common way of presenting data for two variables, which have a relationship, is in a figure or chart of graph that works best when the data is continuous. A figure is used to show the changes of dependent variable in relation to the change of independent variables. It is common practice to place the independent variable along x- axis and dependent variables along y-axis. For the calculation, the researcher has selected the financial ratios as dependent variables and the time in years as independent variables.

3.6.6 Questions and interviews:

To analyze the primary data the questionnaire techniques has been used. These questions are asked to those employees who are not direct related to Kavrepalanchwok branch.

- ❖ Do you agree NEA has maintained any relevant policy regarding to receivable collection?
- ❖ Do you agree that current liabilities are used in the proper way to maximize the profit of NEA?
- ❖ Do you agree that total assets are used in the proper way to maximize the profit of NEA?
- ❖ Do you agree that long term debt is used in the proper way to maximize the profit of NEA?
- ❖ Do you agree that total debt is used in the proper way to maximize the profit of NEA?
- ❖ Do you agree that capital is used in the proper way to maximize the profit of NEA?
- ❖ Do you agree that gross revenues are used in the proper way to maximize the profit of NEA?
- ❖ Do you agree that operating expenses are used in the proper way to maximize the profit of NEA?

These questions are asked to the employees of the Kavrepalanchwok branch.

- ❖ Is the work is interested which you are doing?
- ❖ Is your salary sufficient for you?
- ❖ How is your job challenging and risky?
- ❖ Does your manager help in your work?
- ❖ Do you get any chance to show your ability?
- ❖ Can use your own judgment in your work?
- ❖ Are your friends helping your work?
- ❖ How is the place where you work?
- ❖ What is the condition of revenue collection of the branch?
- ❖ Is the sales is in increasing trend?
- ❖ What is the loss percentage of the branch?
- ❖ Aren't the operation and maintenance expenses higher than last year?
- ❖ What is the condition of inventory of the branch?

3.6.7 Methods of presentation and analysis:

Simple methods of analysis have been used, data presentation and analysis has been divided into small sub-topics. Every result has been tabulated and clear interpretation on it has been given simultaneously. Detail of calculations has been presented in appendices at the end of the report. Tables, diagrams and graphs have been used to make report clear and easily understandable. Summary, conclusion and recommendation have been presented at the last chapter of the report.

CHAPTER - 4

PRESENTATION AND ANALYSIS OF DATA

4.1 Introduction

The objectives of the study have been already highlighted in the first chapter. In order to accomplish the above objectives, descriptive and analytical research design has been followed, which are mentioned in the third chapter. The main objective of this study is to evaluate the condition of sales and revenue in NEA Kavrepalanchwok. To analyze the behaviour between these two factors, various presentation and analysis have been done in this chapter. As mentioned earlier, various financial and statistical tools have been used, in order to accomplish the targeted objectives.

However the study focused the behaviour of sales and collection of NEA Kavrepalanchwok but here is compelled to attach the data of entire NEA. It is necessary to compare the percentage of sales and collection of NEA Kavrepalanchwok to entire NEA's collection. So here different statistical and financial tools are used to show the performance of the branch. Only behaviour of sales and collection is not sufficient to this report so different analysis has been made in this report. The tools used for the purpose of analysis have been discussed detail in the research methodology. Some financial and statistical tools have been used to evaluate the relationship of sales and collection. Under the financial tool have included ratio analysis and under the statistical tools here is included coefficient of correlation the probable error of the coefficient of correlation regression. In the ratio analysis an attempt is made to evaluate liquidity position, turn over ratio profit position and other important ratios, which help to evaluate the financial position of NEA Kavrepalanchwok. To assess the financial performance of NEA the whole analysis has been divided into the following sections.

- ❖ Ratio Analysis
- ❖ Correlation Analysis
- ❖ Average
- ❖ Some Other Analysis Which has Done by the Branch

4.2 Status of revenue and sales

Before presenting the financial ratio and other calculations it is necessary to shows the status of revenue and sales of the branch during seven year period. Those data are tabulated as:

Table – 4.1
Status of revenue and sales   (Rs in 000)

Particulars	Fiscal Year						
	2001	2002	2003	2004	2005	2006	2007
Total assets	182254.38	205143.87	226453.83	248907.61	272405.24	304521.09	308787.01
Total Sales unit	16892.50	17094.61	17112.47	17208.58	17138.97	18318.83	19732.92
Total Sales Amount	96824.58	100826.91	109932.82	115648.27	115576.84	121953.36	129932.72
Total Revenue Collection	96325.49	93626.50	95228.11	98077.07	97223.56	105256.20	110697.97
Debtors Up To	51218.63	62013.72	73210.51	91814.24	100253.87	115009.68	122526.84
Total Power Purchased Unit	25876.43	26049.32	26776.02	27094.32	26996.49	27259.78	29647.14
Total Power Purchased @ Rs. 5.57	144131.73	145094.68	149142.45	150915.38	150370.43	151836.99	165134.58
Net Profit / Loss	-30126.46	-30546.32	-34624.90	-40083.15	-49487.13	-67304.90	-85756.89

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement

Diagram: Relation ship between sales with collection and power purchased with sales:

4.3 Ratio Analysis

The important financial tool for analysis of financial position is ratio analysis. It is defined as the systematic use of ratio to interpret the financial statements so that the strengths and weaknesses of a firm as well as its historical performance and current financial condition can be determined. In the base of this study financial ratios can be classified into

4.3.1 Turnover ratio / Activity ratio:

Funds of creditors and owners are invested in various assets to generate sales and profits. The better the management of assets, the larger the amount of sale. Activity ratios are employed to evaluate the efficiency with which the firm manages and utilizes its assets. These ratios are also called turnover ratios because they indicate the speed with which assets are being converted or turned over into sales. So it involves a relationship between sales and

assets generally reflect that assets are managed well. Several activity ratios can be calculated to judge the effectiveness of assets utilization

4.3.1.1 Total assets turnover ratio:

According to the table shown the gross operating revenue of the branch has increased in each year. The investment on assets had increased in each year as compared with the revenue generating ability. Total assets are the sum of fixed and current assets of the firm fixed assets have direct effect in the generation of sales. But there are also other assets that contribute to the production and sales activities of the firm. Therefore firm must manage its total assets efficiently and should generate maximum sales through their proper utilization.

The total assets turnover ratio of Kavrepalanchwok branch has been computed by taking seven years data of net sales from the sale of electricity services.

$$\text{Total assets turnover ratio} = \frac{\text{Sales}}{\text{Total Assets}}$$

Table – 4.2

Total Assets Turnover Ratio

(Rs in 000)

Fiscal Year	Sales	Total assets	Ratio
2001	96824.58322	182254.3842	0.531260653
2002	100826.9074	205143.8696	0.491493641
2003	109932.8152	226453.8311	0.485453546
2004	115648.2718	248907.6102	0.464623286
2005	115576.8362	272405.2373	0.424282724
2006	121953.3621	304521.0924	0.400475912
2007	129932.7184	308787.0124	0.420784273

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement
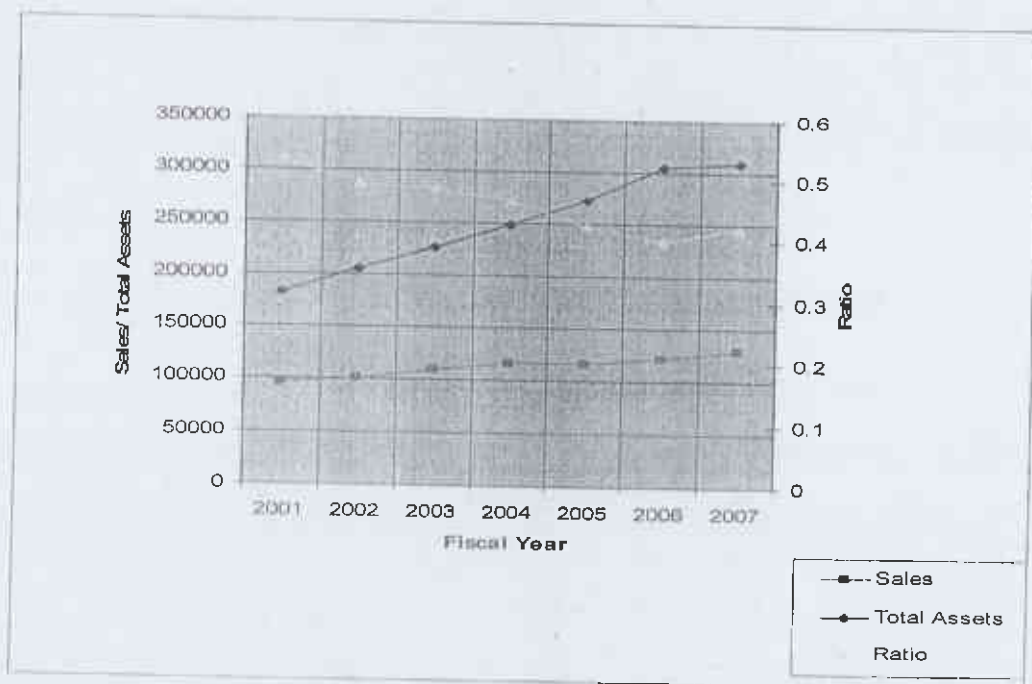
According to the above table, the net sale of the NEA has increased every year. The investment on assets has highly increased in each year. As compared with the revenue generating ability, investment on assets has highly increased during the year.

The total assets turnover ratio showed the branch's ability of generating revenue from all the financial resources committed to the NEA Kavrepalanchwok. The total assets turnover ratio indicated the sales generated per rupees of investment in total assets. In the years 2001 NEA Kavrepalanchwok has earned Rs. 0.531sales only for rupees of investment in its total assets. Like wise NEA Kavrepalanchwok has earned only Rs. 0.491 sales for its one rupee investment in the assets in 2002. An average the branch has been able to produce only Rs. 0.420 sales for one rupee investment in its total assets during the seventh year. This reflected the good status in comparison with total assets. The ratio showed that branch was effective in the utilization of its assets. The ratio was in an increasing trend. But it has not reached a satisfactory level. The sales volume however seemed to be growing each year in comparison to total assets the result shows the good condition. During the year 2001 to 2007 the ratio of sales is increasing than total assets because the branch is not able to distribute its line (Assets) to remote place because of the poor political condition of the country.

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However the ratio shows the good condition but it will be very poor condition if we compare the sales to received unit of electricity.

This position clearly indicates that the branch has properly utilized its assets. To generate sales revenue but there are many old out dated assets, which were not in auditor's position to provide desirable yield.

However here is unplanned investment in the assets of NEA, without making proper analyses of cost and benefits. Attention did not seem to be paid in the revenue generation aspects of assets and their effective utilization as well as the costs of investments. The low volume of sales in comparison to the investment made was the reason for this situation and at last it may be said that the management of NEA is either not able to utilize the assets properly or assets were purchased without considering the ability to generate revenue.

4.3.1.2   Debtors turnover ratio:

Debtors' turnover is found out by dividing credit sales by debtors. 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. So to see the behaviour between receivable and net revenue from sales the receivable turnover ratio is computed. In the following table the debtor's turnover ratio is shown:

Debtors' turnover can be calculated by dividing total sales by the year end balance of debtors.

$$\text{Debtors turnover ratio} = \frac{\text{Sales}}{\text{Debtors}}$$

Table – 4.3

Debtors Turnover Ratio

(Rs in 000)

Fiscal Year	Sales	Debtors	Ratio
2001	96824.58322	51218.63	1.890417141
2002	100826.9074	62013.72	1.625880687
2003	109932.8152	73210.51	1.501598898
2004	115648.2718	91814.24	1.259589652
2005	115576.8362	100253.87	1.15284165
2006	121953.3621	115009.68	1.060374787
2007	129932.7184	122526.84	1.060442934

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement
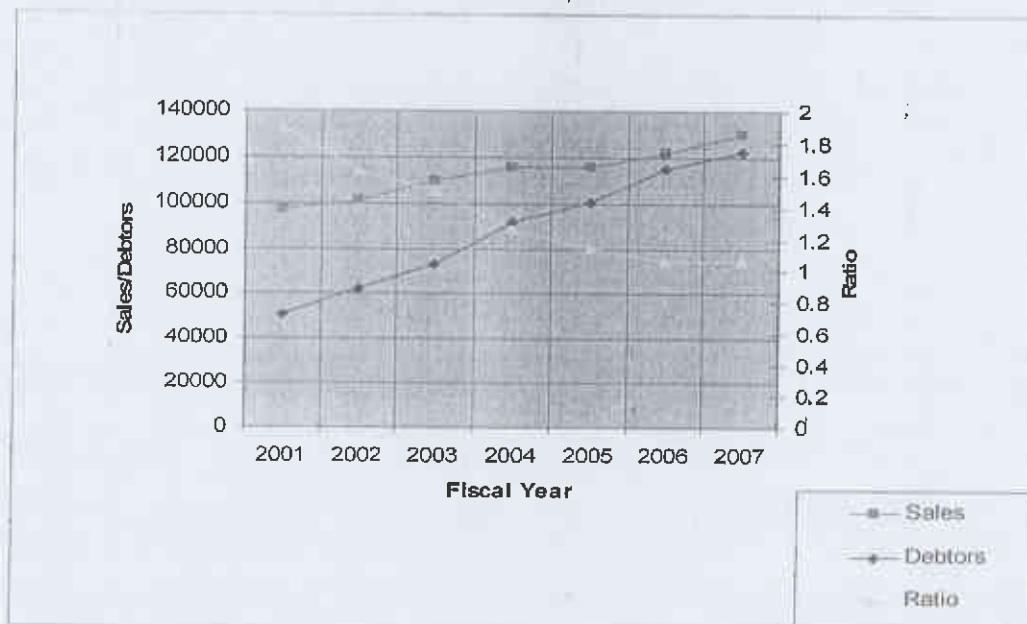
The analysis of debtors' turnover ratio supplements the information regarding the liquidity of one item of current assets of the firm. The ratio measures how rapidly debts are collected. A high ratio is indicates of shorter time lag between credit sales and cash collection. A low ratio shows that debts are not being collected rapidly.

In the table 3, it may be observed that the debtor's turnover ratio has decreased in year 2001 to 2005. And in 2006 or in 2007 DTR is little bit more

than in the past year. In this report we can see that beginning is very attractive as the time past DTR is becomes less than the previous years. There is only one reason by which DTR is decreasing rapidly. By the loose management, rules and regulations of the branch and poor political condition of the country the branch is unable to collect its revenue so the debtors is increasing highly. As we can see debtors' turnover ratio of NEA Kavrepalanchwok in Fiscal year 2001 is 1.89 the sales and the debtors are increasing quickly in comparison of sales debtors is increasing rapidly so ratio has become 1.62, 1.50, 1.25, 1.15, 1.06 and 1.06 in the year 2002, 2003, 2004, 2005, 2006 and 2007 respectively. It shows that in fiscal year 2001 debtors' turnover ratio is high which indicates that shorter time lag to collect credit sales and cash collection. In fiscal year 2006 DTR is very low which indicates that longer time lag to collect credit sales and cash collection. In the year 2007 DTR is in improving condition because the ratio is high than the past year.

The branch has accepted that it is important to collect receivable timely. Some collection measures have been taken such as mobile team, 3 % discount system to those customers who pay bills during 7 days of meter reading, extra charge after the due payment date etc.

NEA Kavrepalanchwok Branch is small branch it has limited authority, resources and right it cannot mobilized its limited resources to entire district. So NEA Kavrepalanchwok as well as central management should take it seriously in the 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 correction actions should be taken in revenue collection from different sectors. Especially dues from government agencies and institutions streets lights which seemed to be the greatest defaulter should be given priority for collection. Finally it can be said that there is not any clear policy for debtors or receivable management in NEA.

4.3.1.3 Average collection period (ACP):

The average number of days which debtors remain outstanding is called average collection period. It can be computed as follows.

Average collection period (ACP)   = $\dfrac{360}{\text{Debtor's Turnover}}$

Table – 4.4
Average Collection Period (ACP)

(Rs in 000)

Fiscal Year	Debtors	Sales	DTR	ACP	
				Debtors / Sales *360	360 / DTR
2001	51218.63	96824.58	1.890417141	190.4341598	190.4341598
2002	62013.72	100826.91	1.625880687	221.4184613	221.4184613
2003	73210.51	109932.82	1.501598898	239.7444487	239.7444487
2004	91814.24	115648.27	1.259589652	285.8073655	285.8073655
2005	100253.87	115576.84	1.15284165	312.2718544	312.2718544
2006	115009.68	121953.36	1.060374787	339.5026028	339.5026028
2007	122526.84	129932.72	1.060442934	339.4807854	339.4807854

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement
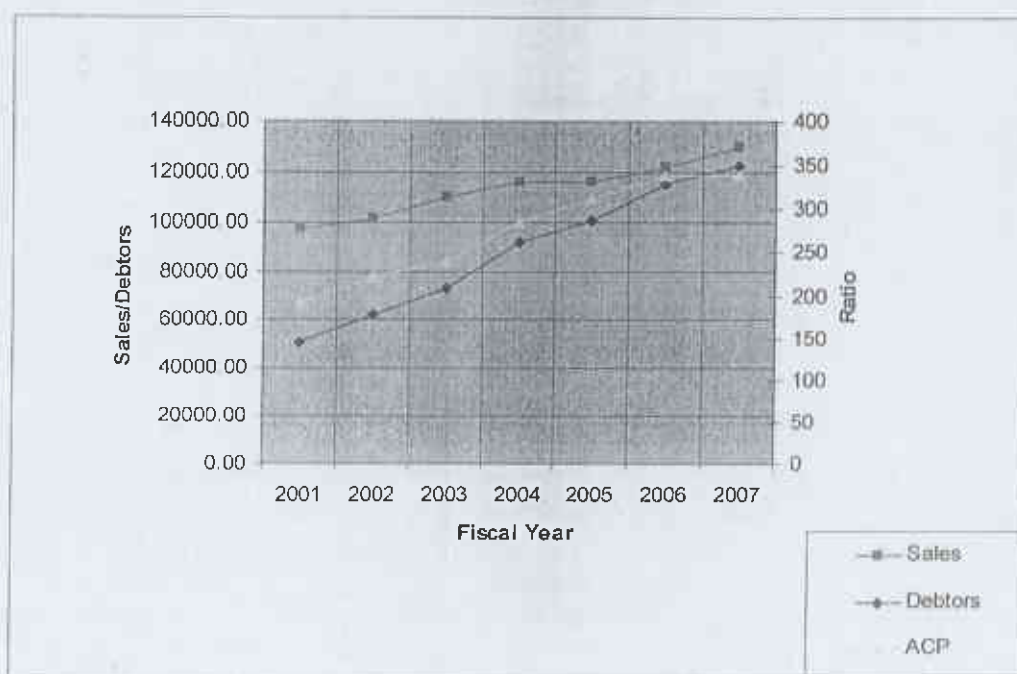
Average collection period (ACP) provides the information on the liquidity of the receivable. Shorter the period of collection, higher in the debtor's turnover ratio. Higher duration of collection period is tying the wealth of business in the

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form of debtors. To see the relationship between receivable and net revenue from sales the receivable turnover ratio and average collection period were computed. In the following table the debtor's turnover ratio and average collection period are shown. While calculating the average collection period it indicates inefficiency of the firm in collection of receivable. ACP is going in increasing trend. It indicates that the firm is failure to collects its debtors. Comparing the seven years ACP is the good in the year 2001 which is 190 days this shows that branch is able to decrease the time of debt collection. It is seen that the receivable is in an increasing trend over the seven years study period. It increased from Rs. 51218630.00 to Rs. 122526840.00 from the year 2001 to 2007. The revenue from sale of electricity was also on our increasing trend and it increased from Rs. 96824580.00 to Rs. 129932720.00 from the year 2001 to 2007. The collection period for the year 2001 is 190 days and it reached the peak days. It has increased 339 in the year 2007 during the 7 year period it is in increasing trend it shows the bad performance of the branch. The collection period for in the table may be observed that the debtor's turnover ratio is decreasing in the year 2001 to 2006. On the other hand average collection period is increasing but in the year 2007 it decreased .02 while DTR increased by .00007 it meant there is negative relationship between average collection period and receivable turnover ratio. On the basis of this it may be concluded that lower the collection period means the company gets recovered its cost quickly and so the turnover ratio will be high. It reveals that such low turn over of receivable or longer receivable collection period has greatly blocked the amount required for the working capital. The amount of revenue from sales has increased higher than the increase in amount of receivable.

We can see in the table when DTR is decreasing ACP is increasing. So the better performance of the branch is less ACP, higher DTR. In the case of NEA Kavrepalanchwok branch the main cause of maximum receivable is large amount dues from street light about Rs. 6,50,00000.00 is due from street light which should be paid by the government, the branch is unable to recover that types of dues amount because of the loose management. However it is also the responsibility of the branch to collect its revenue by using different technique.

4.3.2 Profitability ratio:

A Company should earn profits to survive and over a long period of time profits are essential, but it would be wrong to assume that every action initiated by management of a company should be aimed at maximizing profits, irrespective of social consequences. It is unfortunate that the word 'profit' is looked upon as a term of abuse since some firms always want to maximize profits at the cost of employees, customers and society. Except such infrequent cases, it is a fact that sufficient profits must be earned to sustain the operation of the business to be able to obtain funds from investors for expansion and growth and to contribute towards the social overheads for the welfare of the society.

Profit is different between revenues and expenses over a period of time. Profit is the ultimate 'output' of a company, and it will have no future if it fails to make sufficient profits. Therefore, the financial manager should continuously evaluate the efficiency of the company in terms of profits. The profitability ratios are calculated to measure the operating efficiency of the company, creditors and owners are also interested in the profitability of the firm. Creditors want to get interest and repayment of principal regularly. Profit position of NEA Kavrepalanchwok can be found by applying the profitability ratios. Profitability ratio indicate the corporations overall efficiency of operations. It is true that higher the profitability ratios better the financial position and vice versa.

4.3.2.1 Net profit ratio:

It shows the relationship between net profit and sales. In the following table, seven years data of net profit and revenue from sales of electricity services have been presented to calculate the net profit to sales ratio.

Net profit ratio   = $\dfrac{\text{Net profit (loss)}}{\text{Sales}}$

Table – 4.5

Net Profit Ratio

(Rs in 000)

Fiscal Year	Net Profit / Loss	Sales	Ratio
2001	-30126.46	96824.58	-0.311144731
2002	-30546.32	100826.91	-0.302958057
2003	-34624.90	109932.82	-0.314964162
2004	-40083.15	115648.27	-0.346595307
2005	-49487.13	115576.84	-0.428175184
2006	-67304.90	121953.36	-0.551890482
2007	-85756.89	129932.72	-0.660009982

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement
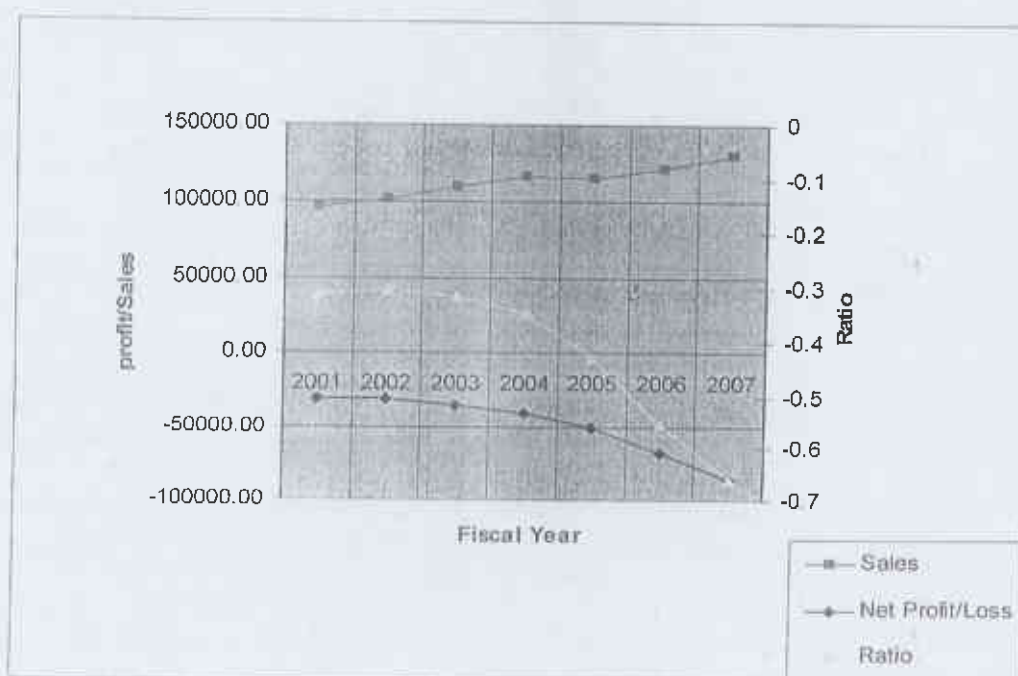
Sales constitute the fundamental dynamic force in a business enterprise without sufficient sales of goods and services business may not be successful.

The ratio of net profit to sales shows the profitability of corporations indicating that the only increase in sales does not means anything unless it commands profit. From this ratio it can also be acquired the information of the total expenses incurred during certain period of time.

According to the table the branch has been suffering from heaving losses during the seven year period. It is in the increasing trend the negative ratio has been increased from -0.3111 in the year 2001 to -0.6600 in the year 2007. In the year 2001 the ratio is -0.3111 it shows the better performance because of the less negative profitability ratio. The negative ratio decreased to -0.3029 in the year 2002 it is the best profit ratio in the seven year period but it reached to -0.4281 in 2005 and in 2007 it goes to -0.6600. It shows that in the beginning five years the trend of increasing is less but in the last year it reached to -0.6600. Loss has been increased very highly in the last year, we have already discussed that because of the poor political condition of the country the branch is unable to collects it revenue. So the income of the branch is moving very slowly however sales and revenue collection is also in the increasing trend but in comparison with profit the increasing trend of sales is very slow. The main cause of the loss is maximum receivable. An expense of the branch (Capital or Maintenance) is not so high so we can't say that the reason behind the loss was heavy operating expenses. The branch received electricity from sub-stations (Transmission) and sold to the consumer. The difference between the received unit of electricity and   consume unit of the electricity is loss. In the way there are two types of loss technical loss and non technical loss both types of losses harms profit of the branch. In the fiscal year 2001 and 2002 entire NEA goes through the profit but the Kavrepalanchwok branch is suffering from loss. Some other factor is also involved in the loss of the branch. The reason behind the loss was depreciation and doubtful debts are also become instruments to cut off profit margin.

4.3.3 Sales to power purchased ratio

When we calculate sales amount to different ratios, I think it is important to show the relationship between Sales to Power Purchased. Here power means that electricity which branch took from transmission sector. We have already

known that transmission get power from generation and supply to distribution sector. NEA Kavrepalanchwok is a small branch of a distribution sector. It gets power from transmission sector and sold it to the consumer. The variation between these two factors is profit / loss. The ratio between sales and power received has shown in the table below.

Ratio = $\dfrac{\text{Sales Amount}}{\text{Power Purchased Amount}}$

Table – 4.6

Sales to power purchased ratio

(Rs in 000)

Fiscal Year	Sales	Power Purchased @ Rs 5.57	Ratio
2001	96824.58	144131.73	0.671778393
2002	100826.91	145094.68	0.694904212
2003	109932.82	149142.45	0.737099414
2004	115648.27	150915.38	0.76631201
2005	115576.84	150370.43	0.76861411
2006	121953.36	151836.99	0.803186132
2007	129932.72	165134.58	0.786829265

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement

Sales/ Power Purchased (left axis) and Ratio (right axis) vs Fiscal Year (2001–2007)
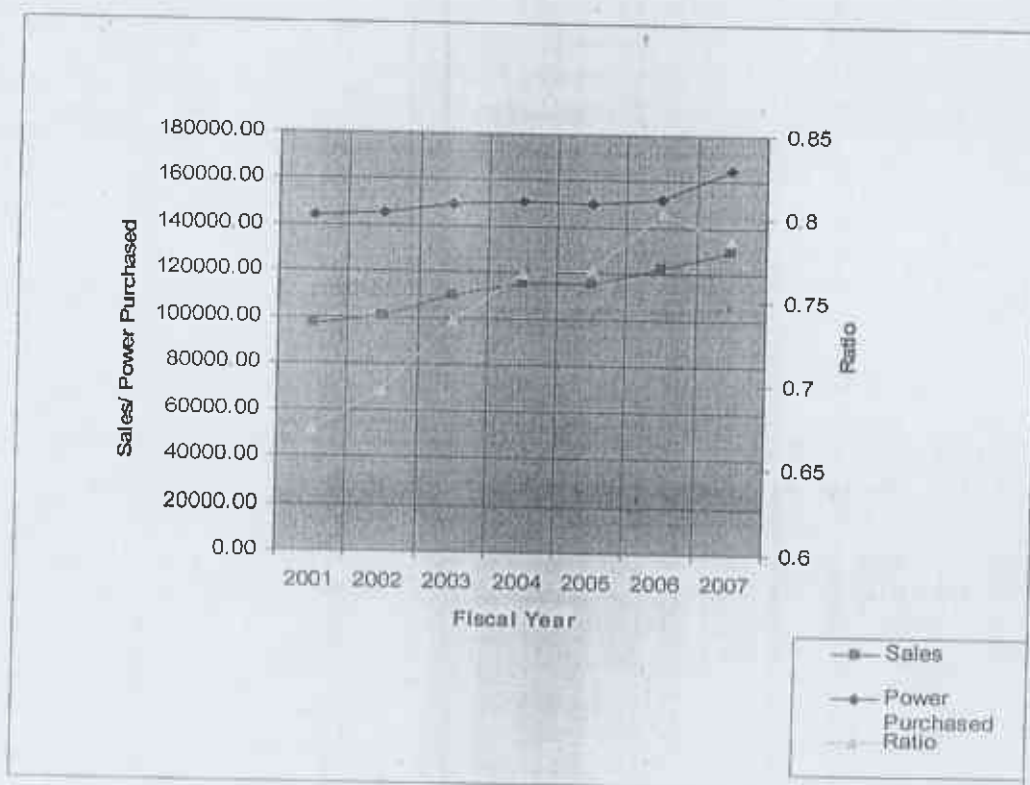
4.3.4. Relationship between sales and revenue collection:

We know that NEA is service oriented organization; however it has its own problems in the field of distribution. In other hand earning profit is also its aim. It is true that the organization is not able to run its business successfully. So the huge amount of loss is increasing continuously.

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

It is necessary to describe the functions of NEA because the diagram shows the view / image of NEA very clearly. We knew that NEA has main three sectors among three sectors distribution is the most important sector of NEA or it is the back bone of NEA. Different operations which are done by NEA those operations are ended at distribution sector. In results NEA get its revenue collection by distribution sector. The revenue which NEA gets from distribution sector is the main income source of NEA. So these two factors sales and collections play vital role in NEA.

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Here we are going to discuss the relationship between these two factors. To Show the clear view it is necessary to show that what portion of sales and collection have taken the branch to entire NEA's sales and collection.

4.3.5 Collection to sales ratio of the branch:

Revenue from sale of electricity is recognized at the time of raising of bills on the consumers. The revenue collection is the collected amount to NEA's counter which is collected by the consumers of NEA.

Return on sales presents relationship between sales and collection of the branch. This shows the percentage of collection on sales. The profitability of the branch is also measured by the relation of sales to collection. An organization makes a huge amount of sales with the expectation that the sales will yield a reasonable amount of profit. The following table shows the return on sales of NEA Kavrepalanchwok over the period of seven years.

Collection % to Sales $=$ $$\frac{\text{Revenue Collection}}{\text{Sales}}$$

Table – 4.7

Collection to sales ratio of branch

(Rs in 000)

Fiscal Year	Revenue Collection	Sales	Ratio
2001	96325.49	96824.58	0.994845429
2002	93626.50	100826.91	0.928586444
2003	95228.11	109932.82	0.866239167
2004	98077.07	115648.27	0.848063397
2005	97223.56	115576.84	0.841202834
2006	105256.20	121953.36	0.863085654
2007	110697.97	129932.72	0.851963751

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement
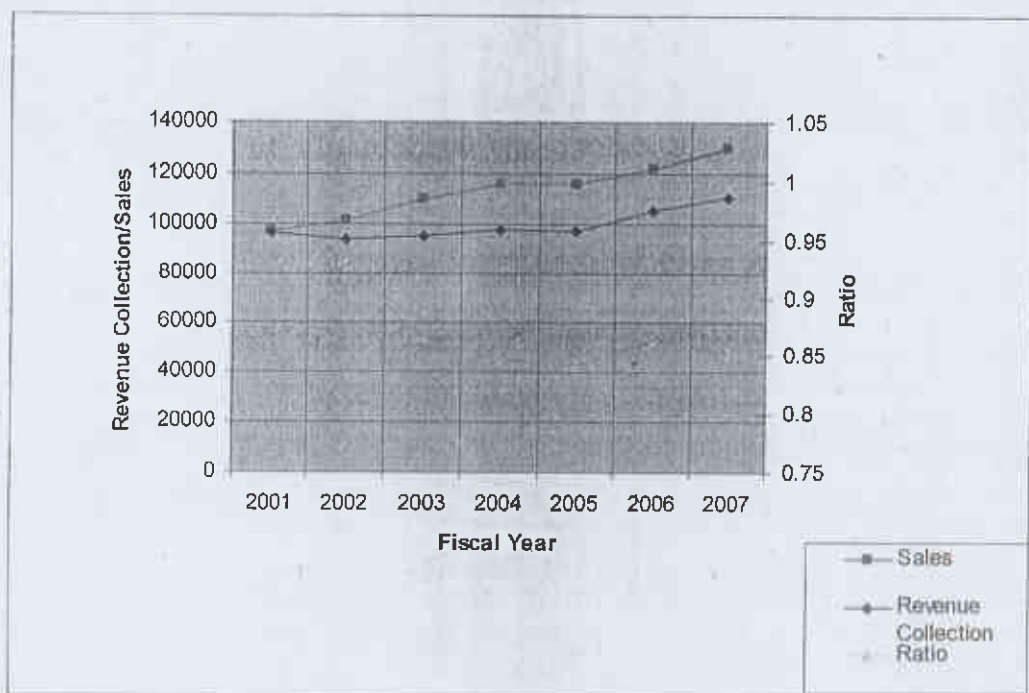
Here % of collection on sales denotes the feed back of sales. As a result the ratio has become highest in the year 2001 which is 99 %. It shows the better performance of the branch. The return on sales, which was not much unsatisfactory during the year 2002 which comes 92%. Later the ratio is declining. In the year 2005 it shows the poorest performance of the branch in the seven year study. However it is not so bad % of collection to sales, but in comparison to other fiscal year it the poorest one. Only 84% collection has been made in the year 2005. Little improvement is shown in the year 2006 by increasing 2 % than previous year. In the last year it again falls by 1 %. The report shows that, in the seven year period 15 % collection has been fall in the comparison to sales.

In conclusion the ratio of collection to sales is poor which threatens the survival of NEA Kavrepalanchwok The overall ratio analysis thus indicates relatively poor performance of the branch. Ratio during the years has decreasing that means the branch is in big trouble in the mobilization of its resources.

4.3.6 Ratio of branch's sales to total sales of NEA:

The main key of profit is sales this is very important factor of any business. NEA is service oriented organization but it has also an aim to gain maximum

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profit by minimum risk. An organization must earn sufficient amount of profit to survive and sustain in the future from its operation. Without it no firm/ organization can exist and the future of the company will be jeopardized therefore, profit is the ultimate outcome of company. So to survive itself NEA is expanding is area day by day. Here Kavrepalanchwok branch has small contribution to total NEA's sales.

Ratio of branch's sales to entire NEA's sales shows the contribution of the Kavrepalanchwok branch. In the following table, seven years data of sales of electricity of NEA's as well as branch's have been presented.

Ratio   =   <u>Branch's Sales</u> :
                     Total Sales

Table – 4.8
Ratio of branch's sales to total sales of NEA

(Rs. in 000)

Fiscal Year	Kavrepalanchwok Branch's Sales	Entire NEA's Sales	Ratio
2001	96824.58	5396800.00	0.01794111
2002	100826.91	5466410.00	0.018444812
2003	109932.82	8160800.00	0.013470838
2004	115648.27	9476200.00	0.012204077
2005	115576.84	11012600.00	0.010494964
2006	121953.36	11814600.00	0.010322259
2007	129932.72	12623600.00	0.010292842

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement and Income Statement of NEA
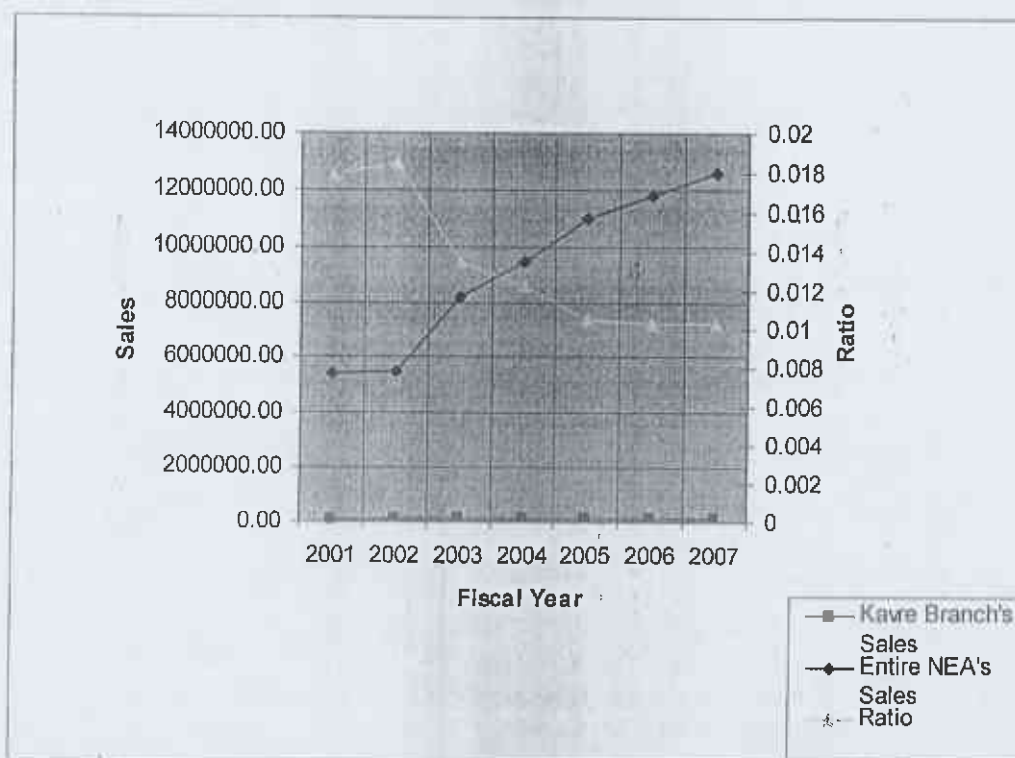
According to the above table, NEA Kavrepalanchwok branch is a very small branch because only 1.4 % (approximately) of sales has taken part in total sales. However NEA Kavrepalanchwok, has a large distribution area in comparison to other branch of Katmandu valley. But there are not so many industries, hotels and other business. So the consumption of electricity is limited in only domestic use. That's why % of sales become very less. The above report shows that, in the F/Y 2002 the branch's sales reached to the peak it is 1.84%. In the F/Y 2007 it comes to the layer which is 1.02% this is the worst performance among 7 years. Total sales of NEA is increasing rapidly, in comparison to total sales, sales of the branch is increasing very smoothly after the F/Y 2003. This is 1.34, 1.22, 1.04, 1.03 and 1.02. The report shows the F/Y 2005 is very poorest because the ratios fall down in a great difference than previous year. There are many reasons behind these falls of sales in the branch. Different types of losses took part in this type of falls; Kavrepalanchwok district is full of many rural areas, so the branch is suffering by different types of problems. All organizations have their own problems but they have to face those problems to run the business in the competitive world.

4.3.7 Ratio of branch's revenue collection to total revenue collection of NEA:

The % of Branch's revenue on total revenue presents behaviour between total revenue and branch's revenue. This shows the contribution of branch's revenue on total revenue. The profitability of an organization is also measured by above relation. NEA has makes a lot of investment on its assets with the expectation that the investment on such assets will yield a reasonable amount of profits as revenue collection. The following table shows the return on total assets of NEA over the period of seven years.

$$Ratio = \frac{Branch's\ Collection}{Total\ Collection}$$

Table – 4.9

Ratio of branch's revenue collection to total revenue collection of NEA:

(Rs. in 000)

Fiscal Year	Revenue Collection Of The Branch	Total Revenue collection	Ratio
2001	96325.490	5496821.000	0.017523854
2002	93626.500	7025158.000	0.013327316
2003	95228.110	8377832.000	0.011366677
2004	98077.070	9687645.000	0.010123933
2005	97223.560	11237491.000	0.008651714
2006	105256.200	12055235.000	0.008731161
2007	110697.970	12968436.000	0.008535954

Source: NEA Kavrepalanchwok Balance Sheet and Income Statement and Income Statement of NEA
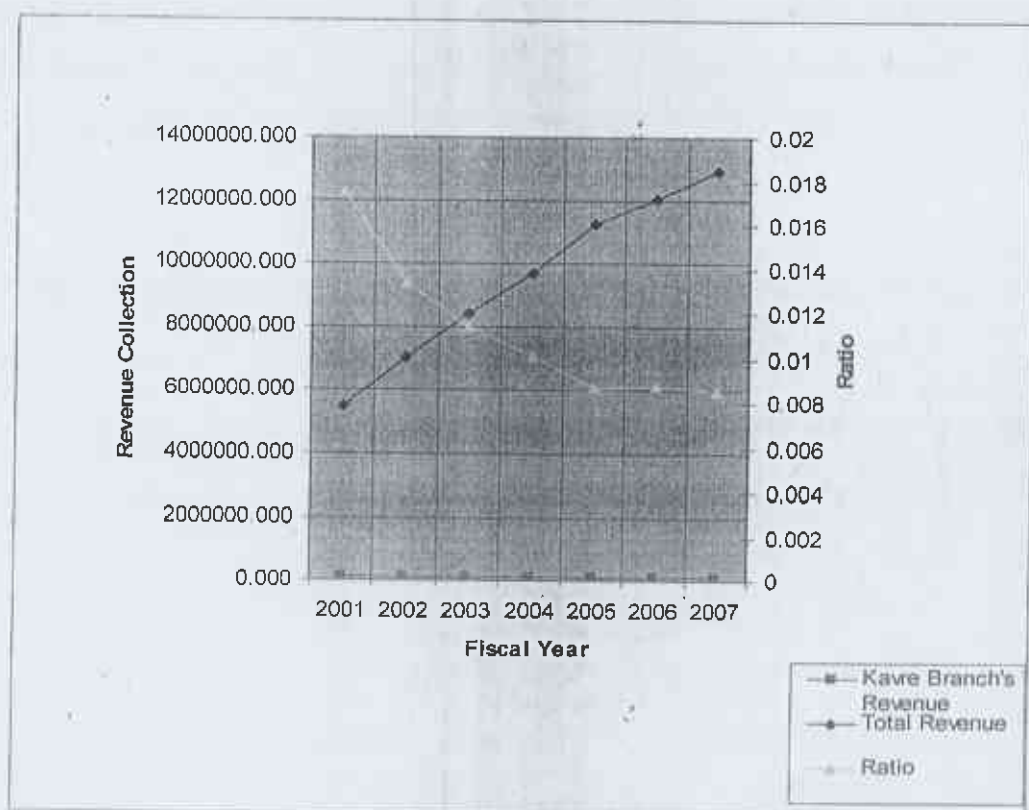
Every organization starts its business in expectation that it will earn maximum profit by minimum level of risk. Some produced goods and some provide its services. In both case the main aim is to earn maximum profit by minimum level of risk. NEA is service oriented organization, having an aim to earn maximum profits. It provide its services to its consumer's although it has an aim to earn profit but now a days it is suffering by heavy loss. We have already known that the main resource's of NEA to run its operations is revenue collection. Total revenue collection of NEA gathered by different branches which it gets from only distribution sector. Here Kavrepalanchwok branch is also a small distribution center however its area is very large but there are so many rural areas. So the consumption of power is limited only in the domestic use. The above table shows that the Kavrepalanchwok branch is very small branch in case of distribution of power because in the Fiscal Year 2006 only 0.85% has been made by the branch or it is the worst performance in the seven year period. In F/Y 2001 the collection % is 1.75 but in 2007 it comes to 0.85%. It shows the heavy difference in collection % in 7 years. In comparison to total collection of 2001 0.90% collections has been reduced in the year 2007. By the above table F/Y 2001 was the golden year of collection

because the collection % in the peak it is 1.75%. Later it becomes fall down. The total collection is climbing up very fast we can see it in the graph. Having least % of collection it is difficult to see branch's collection in the graph. However the collection of the branch is also in the increasing trend but in comparison to total collection it is very unsatisfactory. By the table in the F/Y 2001 it is 1.75% after then it comes 1.33%, 1.13%, 1.01% .086%, .087% and .085%. It shows the little bit improvement in the year 2006 which increased by .001%. If the conditions of the branch not improved it will be difficult to survive it. There is not any competitor of NEA because of the large distribution, generation and transmission area. If any competitor is seen in the market of hydro electricity no one can save NEA. But it can save itself by improving its management efficiency, human resource, assets e.t.c.

4.4 Correlation Analysis

The correlation co- efficient is denoted by 'r' and indicates the direction of relationship between variables. In other words, correlation is the relationship between (or among) two or more variables. In correlation analysis, only one variable is treated as dependent and one or more variables are treated as independent. Correlation analysis is defined as the statistical technique which measure the degree of relationship (or association) between / among the variables. Correlation analysis does not tell any thing about cause and effect relationship. It refers the closeness of the relationship between two or more variables. Two or more variables are said to be correlated if change in the value of one variable appears to be related or linked with the change in the other variables.

There are three types of correlation: simple, partial and multiple. But our concern is only the simple correlation. A method of measuring correlation is called ' Karl Pearson's coefficient of correlation'.

Here formula for calculation the Correlation Coefficient is given below:-

rXY = Correlation coefficient between X and Y.

$$rXY = \frac{N\Sigma XY - \Sigma X \, \Sigma Y}{\sqrt{N \, \Sigma X2 - (\Sigma X) \, 2} \times \sqrt{N \, \Sigma Y2 - (\Sigma Y) \, 2}}$$

rXZ = Correlation coefficient between X and Z.

$$rXZ = \frac{N\Sigma XZ - \Sigma X \, \Sigma Z}{\sqrt{N \, \Sigma X2 - (\Sigma X) \, 2} \times \sqrt{N \, \Sigma Z2 - (\Sigma Z) \, 2}}$$

These are the formula to calculation the correlation coefficient. The three models show the relationship between each variable with other. Either they are correlated or not or either they have positive relationship or negative.

In this analysis, the correlation coefficients between following variables are calculated and analyze the relationship between revenue sales and collection.

❖ Sales, Revenue Collection and Debtors of the Branch

❖ Sales of the Branch and Total Sales

❖ Revenue Collection of the Branch and Total Collection

4.4.1 Sales, revenue collection and debtors of the branch:

Revenue collection is a main source NEA. It is a collected amount from the consumers. Those revenue collections are collected on the basis of sales. If the sale of the company is high the revenue collection will also be high. The variance between the revenue collection and sales is debtors. It is calculated by subtracting the collection amount on total sales amount. The relationship between debtors, collections and sales has been analyzed by using the Karl Pearson's correlation coefficient formula. In order to find out the relationship between these variables, the correlation coefficient has been calculated. From the calculation, it is attempted to measure where increase in sales effects revenue collection or not. Or increase in sales effects debtors or not. The calculated correlation coefficient and the respective probable error have been shown in the following table.

Where,

r = correlation coefficient between two variables x and y. and X and Z

x = Sales

y = Revenue Collection

Z = Debtors

N = Number of observations

Table – 4.10

Sales, revenue collection and debtors of the branch

(Rs. in 000)

No.	Fiscal Year	Sales (X)	Revenue Collection (Y)	Debtors (Z)
1	2001	96824.58	96325.49	51218.63
2	2002	100826.91	93626.50	62013.72
3	2003	109932.82	95228.11	73210.51
4	2004	115648.27	98077.07	91814.24
5	2005	115576.84	97223.56	100253.87
6	2006	121953.36	105256.20	115009.68
7	2007	129932.72	110697.97	122526.84

The Correlation results of Table –X

	Correlation Coefficient	Probable Error
Sales and Collection (XY)	0.8594	0.06861
Sales and Debtors (XZ)	0.9802	0.00998

The Karl Pearson's correlation coefficient between sales and revenue collection of NEA Kavrepalanchwok is 0.8594 and probable error is 0.06861. This figures shows that there is high degree of positive correlation between these variables. The value of probable error clarifies that the relationship between sales and revenue collection of NEA Kavrepalanchwok is significant because the correlation coefficient is more than six times the probable error. It explains that collection is increasing in the same manner as a sale is increasing.

On the other side, the Karl Pearson's correlation coefficient between sales and debtors of NEA Kavrepalanchwok is 0.9802 and probable error is 0.00998. This figures shows that there is high degree of positive correlation between these variables. The value of probable error clarifies that the relationship between sales and debtors of NEA Kavrepalanchwok is significant because the correlation coefficient is more than six times the probable error. The increasing trend of the sales and debtors is in the same way. It explains the positive relationship between sales and debtors.

4.4.2 Sales of the branch and total sales of NEA:

The relationship between sales and total sales of NEA has been analyzed by using the Karl Pearson's correlation coefficient formula. In order to find out the relationship between these variables, the correlation coefficient has been calculated. From the calculation, it is attempted to measure where increase in total sales affects the branch's sales or not. Sales amount of the branch is a small part of the total sales. It is true that there is a positive relationship between the total sales and the branch's sales but at what ratio? Here is the calculated correlation coefficient and the respective probable error has been shown in the following table to show the amount of the relationship between these two factors.

Where,

r = correlation coefficient between two variables x and y.

x = Total Sales of NEA

y = Branch's Sales

N = Number of observations

Table – 4.11

Sales of the branch and total sales of NEA

(Rs in million)

No.	Fiscal Year	Entire Nea's Sales (X)	Sales of Kavrepalanchwok Branch (Y)
1	2001	5396.80	96.82
2	2002	5466.41	100.83
3	2003	8160.80	109.93
4	2004	9476.20	115.65
5	2005	11012.60	115.58
6	2006	11814.60	121.95
7	2007	12623.60	129.93

The Correlation results of Table –XI

	Correlation Coefficient	Probable Error
Total Sales and Sales of the branch (XY)	0.9709	0.01462

The Karl Pearson's correlation coefficient between Total sales and Kavrepalanchwok branch's sales of NEA is 0.9709 and probable error is 0.01462. This figures shows that there is high degree of positive correlation between these variables. The value of probable error clarifies that the

relationship between Total sales and branch's sales of NEA is significant because the correlation coefficient is more than six times the probable error. It explains that the branch's sale is increasing in the same manner as a total sale is increasing. But the ratio of branch's sales to total sales is not 100% so we can say there is high degree of positive correlation between total sales and branch's sales, not perfectly positive correlation.

4.4.3 Revenue collection of the branch and total collection:

It is true that the sale is major part of the organization. Without any feed back there is not any importance of sales. The amount which NEA collects from the consumer is revenue collection. NEA is not able to collect its revenue from consumers due to the poor management of the organization, and some other political obstacles. In the total revenue collection of NEA Kavrepalanchwok branch has also some contribution. Here I am trying to show the relationship between Total collection and collection by the Kavrepalanchwok branch. Whether there is any relation between total collection and branch's collection? It is analyzed by using the Karl Pearson's correlation coefficient formula. In order to find out the relationship between these variables, the correlation coefficient has been calculated. From the calculation, it is attempted to measure where increase in total collection affects the branch's collection or not. It is true that there is a positive relationship between the two factors but at what ratio? Here is the calculated correlation coefficient and the respective probable error has been shown in the following table to show the amount of the relationship between these two factors

4.5.1 Distribution centers:

In continuation of its reform process, NEA has so far implemented a profit center strategy in twenty of its distribution branch offices to run them more effectively on a semi-autonomous model. In order to regulate the Distribution Centers by allocating specific mandate, responsibilities and authorities, the NEA Board has approved the Distribution Center By-laws on February 10, 2003.

The main responsibilities of the Distribution Centers are as follows:

- To adhere to the commercial principles as specified in Nepal Electricity Authority Act, in the execution of their works.
- To provide prompt services to the consumers in a simplified manner.
- To develop a system for result oriented performance.
- To mobilize the manpower most effectively in fulfilling the organizational goals.
- To provide reliable, safe and quality power supply to the consumers.

So far, NEA has established the following 20 Distribution Centers:

1. Kathmandu Center	8. Thimi	15. Bharatpur
2. Kathmandu East	9. Biratnagar	16. Ratnanagar(Tandi)
3. Kathmandu West	10. Kavrepalanchwok	17. Pokhara
4. Kathmandu North	11. Janakpur	18. Butwal
5. Lalitpur	12. Rajbiraj	19. Bhairahwa
6. Pulchowk	13. Hetauda	20. Nepalgunj
7. Bhaktapur	14. Birgunj	

The Distribution Centers are evaluated for each Performance Audit Period (PAP) on a yearly basis based on following performance indicators:

1. Loss Reduction
2. Average Collection Period
3. Stock Turnover Ratio
4. Capital Works Progress
5. Connection Period
6. Reporting and Data Management

After the approval of distribution center act, Kavrepalanchwok branch has now become Kavrepalanchwok distribution center. Now the branch has specific mandate, responsibilities and authorities. Profit center is the synonym of distribution center, which represents that the branch has its right on the profit which it gains by its activities. To gain the profit the performance of the branch should be good.

❖ Electricity Sales detail

This part of the report says that what is the increasing trend of the consumer? How much the branch received power from transmission and how much it sold? By the combination of received and sales of power it helps to calculate the % of loss of electricity.

The increasing trend of the consumer is good, due to many rural areas there are about 10000 consumers increased in the 7 year period.

$$\text{Loss \%} = \frac{\text{Sales Unit}}{\text{Power Purchased Unit}}$$

Here loss % of the electricity reached to the peak in the year 2003 which is 36.49 % and it comes to the layer in the year 2005 which is 32.80 %.

❖ Sales and collection of electricity without street light

The amount of the street light should pay by the government NEA is the semi government organization. This is a part of the nation, so it is difficult for any branch to recover its due amount from street light. Therefore while calculating collection %, debtors, A.C.P, the due amount from street light and sales amount of street light should minimized.

$$\text{Collection \%} = \frac{\text{Revenue Collection}}{\text{Sales} - \text{sales to street light}}$$

In the above report collection % of the branch is affected by the amount of street light. In 2001 collection % with street light is 99.48 % when sales to street light is minimized it becomes 104.79 %. So we can guess how the due affects the performance of the branch.

❖ Stock turn over ratio

The stock turn over ratio of the branch is not so bad which is calculated by

$$\text{Stock Turn Over Ratio} = \frac{\text{Store Expenditure}}{\text{Stock Balance}}$$

Here store balance is the balancing figure at the end the fiscal year and store expenditure is total expenditure of one fiscal year. In the F/Y 2001 S.T.R is 0.856, 0.917 in 2001 and0.830 in F/Y 2007. By the S.T.R F/Y 2002 is best among 7 year because S.T.R reached at the top which is 0.917 and worst in 2005 which is 0.709.

❖ Other analysis

Besides these calculations some other reports should be submitted to show the performance of the branch such as, Details of new connection, C.W.I.P and Data management.

By this report every branch and distribution center are ranked on the basis of bench mark which is given by the management of NEA.

This is a last chapter of this study. In this concluding chapter, an attempt has been made first to make present summary of the study, then conclusion of the analysis and some recommendations, which are useful to take corrective actions from the side of NEA.

Nepal Electricity Authority is a leading and sole corporation in power sector. It was incorporated on 1st Bhadra 1984 B. S. under the Nepal Electricity Authority Act 1984. In order to make effective, dependent and economical production, transmission and distribution of electricity and to manage properly the electricity supply. The history of NEA is already reflected in the earlier chapter. The financial position of Nepal electricity Authority as well as Kavrepalanchwok branch has been analyzed by using various financial and statistical tools.

The over all performance of NEA Kavrepalanchwok according to the analysis is seemed to be more satisfactory. The basic problem can be found as following:

1. The current assets are not been used in the profitable manner; the excess of the current assets utilization has increased the opportunity loss.

2. More than 40 % of the debtors are from street light. Which is UN recoverable? This amount has a bad effect on the performance of a branch.

3. There is heavy % of loss of electricity by which it minimized the profit of the branch.

4. The branch is not utilizing the total assets in the productive areas due to the destruction of political revenge. The big amount of property loss has been incurred in the past four to five years and it has affected the profitability of the branch.

5. The branch is not success to mobilize its human resource, there are about 148 employees in the branch but every activities move very slow.

6. The revenue collection is moving very smoothly, people have to pay Rs. 100.00 for transportation, when they come to pay electricity bill of amounting Rs. 80.00. So the branch should establish mobile counter.

7. Many consumer ledgers are destroyed in the violence during the year 2000 A.d. This makes very difficult to calculate total debtors of the branch.

8. The expenses incurred in the branch is also shooting boom, therefore it is not only influencing the profitability but also influencing to different turnover ratios.

9. However there are many obstacles, problems and difficulties the branch is trying its best to solve these types of problems and obstacles.

The major findings of this study as related in analysis are summarized hereunder.

1. Total assets turnover ratio indicates the organizations work efficiency during the study period. Sales revenue is increased each year. This shows the branch has used its fixed assets in generation of sales in a constant proportion. The firm is not efficient in generating proper sales by the total assets. Fixed assets turnover ratio of the branch is 0.45 times on an average. The ratio is in increasing trend, but not satisfactory. NEA Kavrepalanchwok branch has lack of efficiency in utilizing of fixed assets in generating sales.

2. Debtors' turnover ratio of NEA Kavrepalanchwok in fiscal year 2001A.D is 1.89 and 2002, 2003, 2004, 2005, 2006 and 2007 is 1.62, 1.50, 1.25, 1.15, 1.06, 1.06 respectively. It shows that in fiscal year 2001A.D DTR is .high which indicates that shorter time lag to collect sales and

remaining sampled years DTR is lower which shoes that debts are not being collected rapidly.

3. Average collection period of NEA Kavrepalanchwok indicates inefficiency of the organization in collection of receivable. ACP is in highly increasing trend, which indicates the firm is failure to collects, its debtors.

4. Net profit margin on sales is found in the range -0.311 to -0.66. In an average this ratio is -0.48. This indicates that the branch has been suffering from heaving losses during the seven year period.

5. Sales to power purchased ratio of the branch indicate very poor performance. The ratio is within 0.67 to 0.78 which says that there is heavy loss in sales of power because the ratio is in the increasing trend in the seven year period.

6. Collection to Sales Ratio of the Branch is not satisfactory; the ratio must be in increasing trend to show the good performance. Here the ratio lies "between" 0.99 to 0.85 in the seven year period. This says that the branch is unable to collect its revenue.

7. The percentage of sales of branch to total sales of NEA is 0.017 in the fiscal year 2001 and 0.010 in the year 2007 in comparison to total sales; the ratio of branch's sales is decreasing. However there is little improvement in F/Y 2002 but after then the ratio is not satisfactory.

8. Ratio of Branch's Revenue collection To Total Revenue collection Of NEA indicates the branch's work inefficiency during the study period. Collection revenue is decreasing each year in comparison to total collection. The branch is not efficient in collecting proper revenue collection.

its management, resources and other factors to establish itself in the competitive market.

5. 2 Conclusion

To conclude this study, it may be appropriate to note down the basic issues and constraints related to this study. Based on the conclusion drown from findings described above, the more important and basic issues and constraints are found in the following side.

- ❖ Lack of well-planned & management
- ❖ Weak utilization of resources
- ❖ Problems by political condition
- ❖ Low level of budget
- ❖ Higher burden of expenses
- ❖ Lack of trained man power
- ❖ Wide area have to covered
- ❖ Leakage of Electricity
- ❖ Consumer's behaviour

5.3 Recommendations

Based on the major findings of the study of performance of Kavrepalanchwok branch, some suggestions have been recommended in this part. It is hoped that these recommendations will prove to be useful to management of the branch.

1. NEA Kavrepalanchwok has a large number of customers (about 36000) ranging from domestic, industrial to government and public undertakings. While serving to such large customer's NEA as well as the branch requires an efficient system of revenue collections so that revenues do not remain ties up in bills receivable. The bill receivable is unproductive and poses implications in the reductions of volume of profits. The collections system should treat equally to all customers and

should not be influenced by political pressures. Revenue accounting should be given adequate importance like expenditure accounting by budget center chiefs and responsible personnel should be appointed to handle this section.

2. Most of the branch of NEA including Kavrepalanchwok branch is suffering from unhealthy working conditions. I would like to suggest them to create a healthy working environment and environment of mutual trust and mutual co-operation.

3. It seems that the government directly or indirectly interferes the settings of strategic plans of NEA. For the improvement on performance, the interference should be minimized. The board of directors should be free in setting the strategic as well as formulating policies.

4. NEA Kavrepalanchwok branch has become Kavrepalanchwok distribution center the central management directly interferes the plans and rules of the branch. For the improvement on performance of the branch, the interference should be minimized.

5. There should be continuous flow of information among various level of management and various groups of employee. The goal, objectives, strategies should be carefully communicated to all staffs and employees.

6. However, numbers of staffs are increasing. All the staffs of the organization are not well trained which is the main reason for over staffing. Overstaffing creates automatically increase in unnecessary operational cost.

Diagram: Decreasing of operational cost.

```
┌─────────────────────┐                          ┌──────────────────────┐
│ Re organization of  │                          │ Result:              │
│ different department│                          │ -Increasing public   │
└──────────┬──────────┘                          │ faith.               │
           │                                     │  -Increase in return │
           ▼                                     │ -Cost decreasing     │
┌─────────────────────┐                          └──────────┬───────────┘
│ Over staff should   │                                     ▲
│ transferred         │                          ┌──────────┴───────────┐
└──────────┬──────────┘                          │ Profit maximization  │
           │                                     └──────────────────────┘
           ▼                                                ▲
┌─────────────────┐    ┌───────────┐    ┌──────────────────────┐
│ Trained Employee│    │ Higher    │    │ Cost minimization    │
│ and staffs      ├───▶│ efficiency├───▶│                      │
└─────────────────┘    └───────────┘    └──────────────────────┘
```
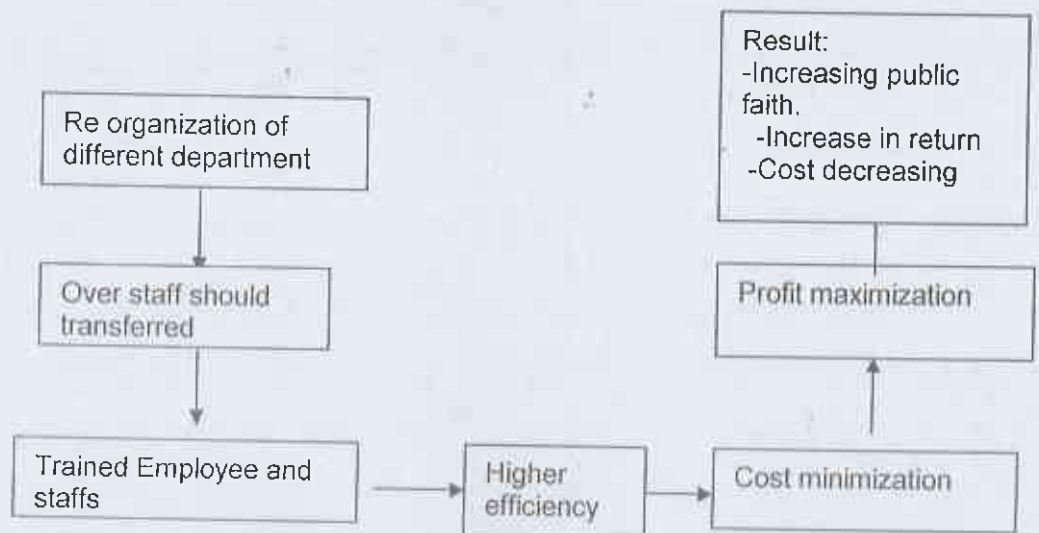
The branch should reduce it's over staffing either by providing training

Opportunities to untrained man power or by hiring skilled and well trained man power from outside. The branch must reorganize its personnel department and should stop entering of unskilled staffs. It helps to increase the benefits and incentives to the staffs that will increase their efficiency. As a result, it leads to the minimization of the operating costs and maximization of profits.

7. Collection of outstanding bill is serious problem of NEA; therefore, following efforts has to be made to collect the outstanding bills as soon as possible.

   Government offices are the main defaulters for increasing the outstanding bill, therefore government should issue circular for all offices to pay their outstanding bill at a time.

   Billing should be made realistic through various collection measures such as encouragement of lump sum, payment through attractive discount, use of mobile collection center to the long distance customer, blacklisting of longer non-paying Customers' immediate action likes disconnection to customer not paying in time, etc.

Revenue accounting should be given adequate importance and responsible personal should be assigned to take up the charge of this section.

Incentives and other facilities should give to those staffs who are directly engaged in the collection of outstanding bill, black listed costumer and electricity theft.

Records and data should be up dated of those consumers who didn't pay the bill for long time. Those records should be managed in book ledger as well as in computer.

8. To increase the net profit the branch should be controlled the operating as well as non-operating expenses. There is in some unnecessary and wasteful expenses. There is possibility to bring down those unproductive expenses, if the management and staffs of the branch is to be more careful in cost factor.

9. It should reduce the loss arose out of leakage outage and theft of electricity.

11. The central level should undertake regular inspection and monitoring visit of budget centers.

12. Regular training should be arranged to impart the concept and knowledge of accounting to the accountants as well as to the chiefs of budget centers.

13. The ledger keeping should be modern it should be computerized.
    The branch is not serious in the case of the debtors the amount of total debtors is increasing if the branch is not does not take any action it will be very harmful.

14. Operating cost should be reduced it helps to reduced the loss of   the
branch.

Based on these recommendations, these guidelines would help in taking
prompt decision in relationship between sales and revenue collection as well
as the performance of the NEA Kavrepalanchwok branch.

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Appendix –I

(Rs. in 000)

No.	Fiscal Year	Sales (X)	Revenue Collection (Y)	Debtors (Z)	X2	Y2	Z2	XY	XZ
1	2001	96824.58	96325.49	51218.63	9374999292.18	9278600023.74	2623348444.24	9326675112.54	4959222701.99
2	2002	100826.91	93626.50	62013.72	10166065780.15	8765921502.25	3845701293.36	9440070689.12	6252651623.04
3	2003	109932.82	95228.11	73210.51	12085224913.15	9068392934.17	5359778193.17	10468694675.57	8048237381.50
4	2004	115648.27	98077.07	91814.24	13374522353.99	9619111659.78	8429855425.16	11342443472.17	10618158494.99
5	2005	115576.84	97223.56	100253.87	13358005944.39	9452420619.07	10050838321.65	11236791838.35	11587025418.40
6	2006	121953.36	105256.20	115009.68	14872622015.29	11078867638.44	13227225886.45	12836347250.83	14025816586.57
7	2007	129932.72	110697.97	122526.84	16882511726.60	12254040562.12	15012825765.62	14383288340.58	15920245194.01
		$\Sigma X=$ 790695.50	$\Sigma Y=$ 696434.90	$\Sigma Z=$ 616047.49	$\Sigma X2=$ 90113952025.74	$\Sigma Y2=$ 69517354939.58	$\Sigma Z2=$ 58549573329.66	$\Sigma XY=$ 79034311379.16	$\Sigma XZ=$ 71411357400.50

r_{XY} = Correlation coefficient between X & Y.

$$r_{XY} = \frac{N\Sigma XY - \Sigma X\, \Sigma Y}{\sqrt{N\, \Sigma X2 - (\Sigma X)\, 2} \times \sqrt{N\, \Sigma Y2 - (\Sigma Y)}}$$

r_{XZ} = Correlation coefficient between X & Z.

$$r_{XZ} = \frac{N\Sigma XZ - \Sigma X\,\Sigma Z}{\sqrt{N\,\Sigma X2 - (\Sigma X)\,2} \times \sqrt{N\,\Sigma Z2 - (\Sigma Z)\,2}}$$

Where,

r = correlation coefficient between two variables x & y. & X & Z

x = Sales

y = Revenue Collection

Z = Debtors

N = Number of observations.

Now,

Calculation of correlation coefficient between sales and Revenue collection of NEA Kavre.

r_{XY} = Correlation coefficient between X & Y.

$$r_{XY} = \frac{N\Sigma XY - \Sigma X\,\Sigma Y}{\sqrt{N\,\Sigma X2 - (\Sigma X)\,2} \times \sqrt{N\,\Sigma Y2 - (\Sigma Y)\,2}}$$

$$r_{XY} = \frac{7 \times 79034311379.16 - 790695.50 \times 696434.90}{\sqrt{7 \times 90113952025.74 - (790695.50)2} \times \sqrt{7 \times 69517354939.58 - (696434.90)2}}$$

$$r_{XY} = \frac{553240179654.12 - 550667941472.95}{\sqrt{(630797664180.18 - 625199373720.25)} \times \sqrt{(486621484577.06 - 485021569938.01)}}$$

$$r_{XY} = \frac{2572238181.17}{\sqrt{5598290459.93} \times \sqrt{1599914639.05}}$$

$$r_{XY} = \frac{2572238181.17}{2992789144.00}$$

$$r_{XY} = 0.8594$$

Since the value of r is 0.8594 we can say that it has a high degree of positive correlation

P.E.

We know,

P.E. (r) $= 0.6745 \times$ SE (r)

$$= 0.6745 \times \frac{(1 - r2)}{\sqrt{n}}$$

$$= 0.6745 \times \frac{(1-(.8594)2)}{\sqrt{7}}$$

$$= 0.6745 \times \frac{0.2691}{2.6458}$$

$$= 0.6745 \times 0.101725$$

P. E. $= 0.06861$

Since, the value of r is greater than 6 times the PE. It can be concluded that r is definitely significant.

Calculation of correlation coefficient between sales and debtors of NEA Kavre.

r_{XZ} = Correlation coefficient between X & Z.

$$r_{XZ} = \frac{N\Sigma XZ - \Sigma X\,\Sigma Z}{\sqrt{N\,\Sigma X2 - (\Sigma X)\,2} \times \sqrt{N\,\Sigma Z2 - (\Sigma Z)\,2}}$$

$$r_{XZ} = \frac{7 \times 71411357400.50 - 790695.50 \times 616047.49}{\sqrt{7 \times 90113952025.74 - (790695.50)2} \times \sqrt{7 \times 58549573329.66 - (616047.49)2}}$$

$$r_{XZ} = \frac{499879501803.50 - 487105978129.29}{\sqrt{(630797664180.18 - 625199373720.25)} \times \sqrt{(409847013307.62 - 379514509935.30)}}$$

$$r_{xz} = \frac{12773523674.20}{\sqrt{5598290459.93} \times \sqrt{30332503372.31}}$$

$$r_{xz} = \frac{12773523674.20}{74821.72 \times 174162.29}$$

$$r_{xz} = \frac{12773523674.20}{13031122119.38}$$

$$r_{xz} = 0.9802$$

Since the value of r is 0.9802 we can say that it has a high degree of positive correlation

P.E.

We know,

$$P.E. (r) = 0.6745 \times SE (r)$$

$$= 0.6745 \times \frac{(1 - r^2)}{\sqrt{n}}$$

$$= 0.6745 \times \frac{(1-(.9802)^2)}{\sqrt{7}}$$

$$= 0.6745 \times \frac{0.0392}{2.6458}$$

$$= 0.6745 \times 0.0148$$

$$P. E. = 0.0099826$$

Since, the value of r is greater than 6 times the PE. It can be concluded that r is definitely significant

Appendix –II   (Rs in million)

No.	Fiscal Year	Entire Nea's Sales (X)	Sales of Kavre Branch (Y)	X2	Y2	XY
1	2001	5396.80	96.82	29125450.24	9375.00	522542.89
2	2002	5466.41	100.83	29881638.29	10166.07	551161.23
3	2003	8160.80	109.93	66598656.64	12085.22	897139.76
4	2004	9476.20	115.65	89798366.44	13374.52	1095906.14
5	2005	11012.60	115.58	121277358.76	13358.01	1272801.51
6	2006	11814.60	121.95	139584773.16	14872.62	1440830.17
7	2007	12623.60	129.93	159355276.96	16882.51	1640218.68
		ΣX= 63951.01	ΣY= 790.69	ΣX2= 635621520.5	ΣY2= 90113.95	ΣXY= 7420600.37

r_{XY} = Correlation coefficient between X & Y.

$$r_{XY} = \frac{N\Sigma XY - \Sigma X\ \Sigma Y}{\sqrt{N\ \Sigma X2 - (\Sigma X)\ 2} \times \sqrt{N\ \Sigma Y2 - (\Sigma Y)\ 2}}$$

Where,

     r = correlation coefficient between two variables x & y.

x = Total Sales of NEA

y = Branch's Sales

N = Number of observations.

Now,

Calculation of correlation coefficient between total sales and Kavre
branch's sales of NEA .

r_{XY} = Correlation coefficient between X & Y.

$$r_{XY} = \frac{N\Sigma XY - \Sigma X \, \Sigma Y}{\sqrt{N \, \Sigma X2 - (\Sigma X) \, 2} \times \sqrt{N \, \Sigma Y2 - (\Sigma Y) \, 2}}$$

$$r_{XY} = \frac{7 \times 7420600.37 - 63951.01 \times 790.69}{\sqrt{7 \times 635621520.5 - (63951.01)2} \times \sqrt{7 \times 90113.95 - (790.69)2}}$$

$$r_{XY} = \frac{51944202.59 - 50565424.09}{\sqrt{(4449350643.5 - 4089731680.02)} \times \sqrt{(630797.65 - 625190.67)}}$$

$$r_{XY} = \frac{1378778.5}{\sqrt{359618963.48} \times \sqrt{5606.97}}$$

$$r_{XY} = \frac{1378778.50}{1419990.40}$$

r_{XY} = 0.9709

Since the value of r is 0.9709 we can say that it has a high degree of positive
correlation

P.E.

We know,

P.E. (r) $= 0.6745 \times SE\ (r)$

$$= 0.6745 \times \frac{(1 - r2)}{\sqrt{n}}$$

$$= 0.6745 \times \frac{(1-(.9709)2)}{\sqrt{7}}$$

$$= 0.6745 \times \frac{0.05735}{2.6458}$$

$$= 0.6745 \times 0.02167$$

P. E. $= 0.01462$

Since, the value of r is greater than 6 times the PE. It can be concluded that r is definitely significant.

Appendix –III   (Rs in million)

No.	Fiscal Year	Total Collection's of Nea's (X)	Collection of the Kavre Branch (Y)	X2	Y2	XY
1	2001	5496.82	96.33	30215041.11	9278.60	529483.98
2	2002	7025.16	93.63	49352844.92	8765.92	657740.96
3	2003	8377.83	95.23	70188069.02	9068.39	797805.11
4	2004	9687.65	98.08	93850465.65	9619.11	950135.84
5	2005	11237.49	97.22	126281203.98	9452.42	1092548.88
6	2006	12055.24	105.26	145328690.91	11078.87	1268888.23
7	2007	12968.44	110.70	168180332.29	12254.04	1435579.54
		ΣX= 66848.62	ΣY= 696.43	ΣX2= 683396647.86	ΣY2= 69517.35	ΣXY= 6732182.52

r_{XY} = Correlation coefficient between X & Y.

$$r_{XY} = \frac{N\Sigma XY - \Sigma X\ \Sigma Y}{\sqrt{N\ \Sigma X2 - (\Sigma X)\ 2} \times \sqrt{N\ \Sigma Y2 - (\Sigma Y)\ 2}}$$

Where,

r = correlation coefficient between two variables x & y.

x = Total Collection of NEA

viii

y = Branch's Collection

N = Number of observations.

Now,

Calculation of correlation coefficient between total collection and Kavre branch's collection of NEA .

r_{XY} = Correlation coefficient between X & Y.

$$r_{XY} = \frac{N\Sigma XY - \Sigma X \Sigma Y}{\sqrt{N \Sigma X2 - (\Sigma X) 2} \times \sqrt{N \Sigma Y2 - (\Sigma Y) 2}}$$

$$r_{XY} = \frac{7 \times 6732182.52 - 66848.62 \times 696.43}{\sqrt{7 \times 683396647.86 - (66848.62)2} \times \sqrt{7 \times 69517.35 - (696.43)2}}$$

$$r_{XY} = \frac{47125277.64 - 46555384.4266}{\sqrt{(4783776535.02 - 4468737995.9044)} \times \sqrt{(486621.45 - 485014.7449)}}$$

$$r_{XY} = \frac{569893.2134}{\sqrt{315038539.1156} \times \sqrt{1606.7051}}$$

$$r_{XY} = \frac{569893.2134}{711459.0835}$$

$r_{XY} = 0.8010$

Since the value of r is 0.8010 we can say that it has a high degree of positive correlation

P.E.

We know,

P.E. (r) $= 0.6745 \times$ SE (r)

$= 0.6745 \times \dfrac{(1 - r^2)}{\sqrt{n}}$

$= 0.6745 \times \dfrac{(1-(.8010)^2)}{\sqrt{7}}$

$= 0.6745 \times \dfrac{0358399}{2.6458}$

$= 0.6745 \times 0.135459$

P. E. $= 0.09137$

Since, the value of r is greater than 6 times the PE. It can be concluded that r is definitely significant.

x

Organizational Structure of NEA Kavre

Distribution Centre Chief
Dept.Manager

New consumer Engineer 1

Construction New Consumer
Supervisor 2

Foreman 3

Meter reading
Senior meter reader 4

Meter reader

Maintenance / No light Engineer 1

Technical
Supervisor 1

Foreman 4

Electrician 2

Helper 4

Panuti Sub Branch

Revenue
Asst.

Accountant 2

Clerk 3

Meter reading
Supervisor 1

Meter Complaint
Asst Engineer 1

Supervisor 1

Electrician 3

Coli 2

Budget Exp
Accountant 1

Asst Account.. 1

Account

Revenue
Asst. Account Officers 1

Accountant 3

Store
Accountant 1

Clerk 1

Administration
Asst Admin Officer 1

Senior Assistant 1

Computer Operator 1

Driver 4

Peon 2

Banepa
Supervisor 2

Electrician 3

Panchkhal
Asst Engineer 1

Supervisor 1

Dhulikhel
Supervisor ज

Electrician

Higuwapati
Foreman 1

Electricia

Pasthali
Foreman 1

Electrician 2

Dapcha
Foreman 1

Electrician 2

Bhakundabesi
Foreman 1

Electricia

Dhunkharka
Foreman 1

Electricia

Palanchwok
Foreman 1

Electricia

Dolalghat
Foreman 1

Electrician 2

Maintenance
Supervisor 1

Electrician 1

Helper 2

Appendix V

Format of sales and collection report of a branch:

Nepal Electricity Authority
Kavre Distribution Centre
Kavre, Banepa
Sales Summary

200 / 200

Category	Shrawan	Bhadra	Ashwin	Kartik	Marga	Push	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashad	Total
Domestic													
Non Commercial													
Commercial													
Industrial													
Water Supply													
Irrigation													
Street Light													
Temporary Light													
Temple													
Internal Consumption													
Total													

Collection Summary

|	Shrawan	Bhadra	Ashwin	Kartik	Marga	Push	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashad	Total
No. Of Consumer													
Bill Amount													
Rebate													
Surcharge													
OtherCollection													

Appendix VI

Format of loss report of a branch:

Nepal Electricity Authority
Kavre Distribution Centre
Loss Analysis Report
For The Year 206 / 206

	Description	Shrawan	Bhadra	Aswin	Kartik	Marga	Poush	Magh	Falgun	Chaitra	Baishakh	Jestha	Ashadh
a	Received Unit (1+2+3+4+5-6)												
b	Utilized Unit (Total of B)												
c	Loss Unit(a-b)												
d	Loss Percentage												
e	Cum. Loss in %												
f	Cum. Loss in %'												
	2004 Cum. Loss in %												
	2003 Cum. Loss in %												
A.	Details of Received Energy												
1	Khopashi P/S	-	-	-	-	-	-	-	-	-	-	-	
2	Banepa S/S	-	-	-	-	-	-	-	-	-	-	-	-
3	Panchkhal S/S	-	-	-	-	-	-	-	-	-	-	-	-
4	Energy Imported through Branch Metering	-	-	-	-	-	-	-	-	-	-	-	-
5	Energy Imported from India	-	-	-	-	-	-	-	-	-	-	-	-
6	Energy Exported through Branch Metering	-	-	-	-	-	-	-	-	-	-	-	-
													-
B.	Details of Energy Sold												
i	Energy Sold to Consumers	-	-	-	-	-	-	-	-	-	-	-	
ii	Street Light	-	-	-	-	-	-	-	-	-	-	-	-
iii	Recovery from Pilferage	-	-	-	-	-	-	-	-	-	-	-	-
	Sub Total	-	-	-	-	-	-	-	-	-	-	-	-
iv	Internal Consumption	-	-	-	-	-	-	-	-	-	-	-	-
A	Details of Received Energy												-

Diagram: The Main Functions of NEA:
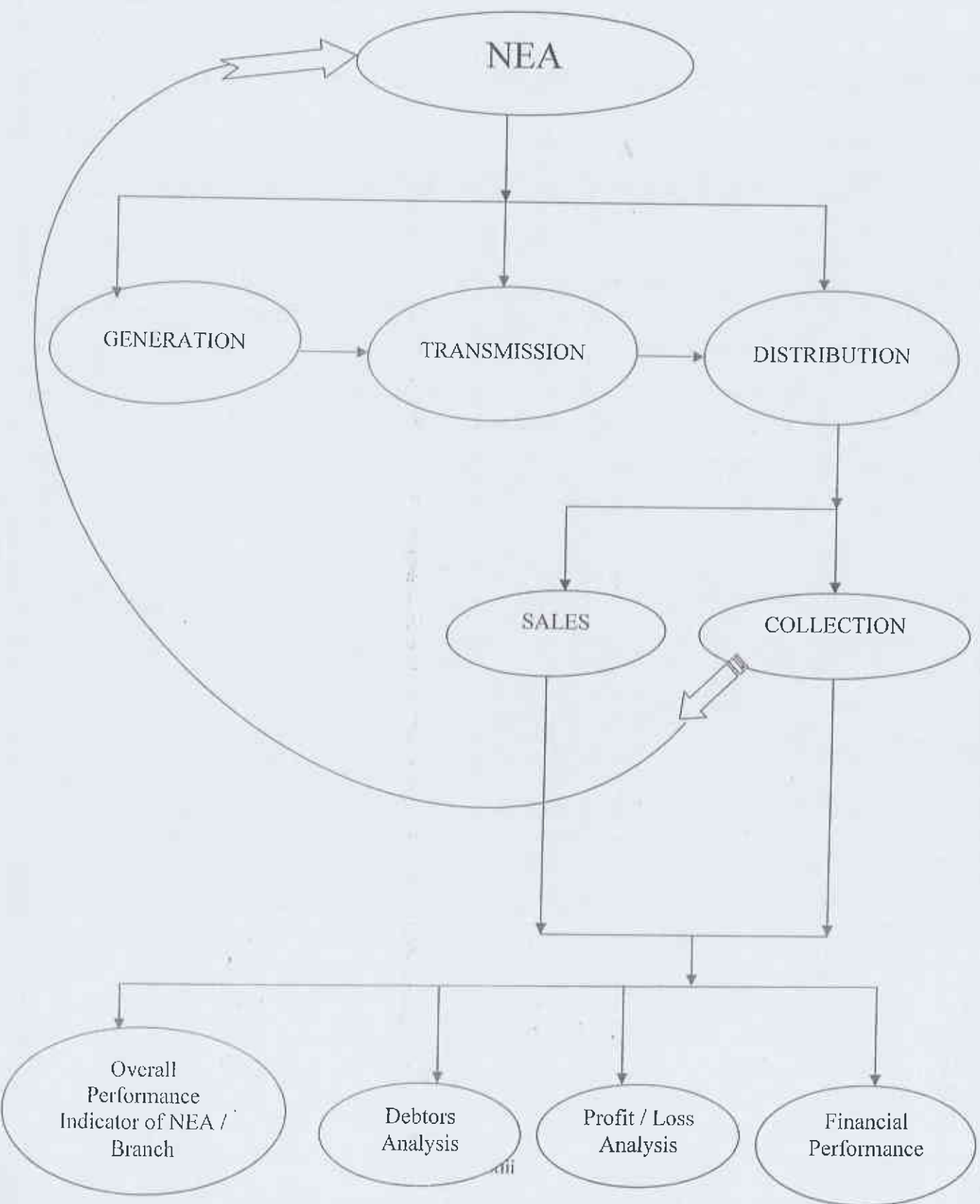
Appendix VIII

Strategy of the collection procedure of outstanding debtors

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┌─────────────────────────────────┐
│ Identify the total amount of     │
│ outstanding bill.                │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│ Different sectors of outstanding │
│ bill should be classified.       │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│ Most sensitive area of outstanding│
│ bill should identify.            │
└─────────────────────────────────┘
                │
                ▼
┌─────────────────────────────────┐
│ Prepare appropriate policy to    │
│ collect the outstanding bill.    │
└─────────────────────────────────┘
```

Indirect collections measure like sufficient counter facilities, payment through bank &regular monitoring.	Central account should provide adequate budget for its office to pay outstanding bill in time.	Attractive collection policies i.e. discount rebates and prepaid scheme etc.
Establish the mobile collection center to the long distance customer.	Immediate action of line disconnection to customers not paying in time.	Blacklisting of longer non-paying customer.

Appendix IX
Nepal Electricity Authority
Kavre Distribution Centre

P.A.P (Performance Audit Period) Report

	Detail	2001	2002	2003	2004	2005	2006	2007
1	**Electricity Consume Detail**							
1	Total No. Of consumer	21,086	22,626	24,326	26,226	28,208	30,042	31,695
2	Total Received Unit	25,876,433	26,049,315	26,776,024	27,094,324	26,996,487	27,259,782	29,647,141
3	Total Sales Unit	16,892,497	17,094,610	17,112,469	17,208,580	17,138,971	18,318,826	19,732,924
4	Loss % Of electricity	34.72	34.38	36.09	36.49	36.51	32.80	33.44
2	**Electricity Sales and Collection Detail**							
1	Electricity Sales Amount	96,824,583.22	100,826,907.40	109,932,815.22	115,648,271.83	115,576,836.17	121,953,362.12	129,932,718.41
2	Collection Amount	96325494.01	93626499.40	95228110.25	98077066.20	97223562.21	105256197.34	110697966.14
3	Collection %	99.48	92.86	86.62	84.81	84.12	86.31	85.20
3	**Sales and Collection Of electricity Without Street Light**							
1	Sales of electricity Without Street light	91,921,308.22	95,402,007.40	101,563,555.22	106,262,939.83	106,191,504.17	112,568,030.12	120,547,386.41
2	Collection Without Street Light	96,325,494.01	93,626,499.40	95,228,110.25	98,077,066.20	97,223,562.21	105,256,197.34	120,697,966.14
3	Collection % without Street light	104.79	98.14	93.76	92.30	91.55	93.50	91.83
4	Total Due Amount	51,218,633.76	62,013,718.59	73,210,506.03	91,814,244.13	100,253,869.36	115,009,677.36	122526836.9
5	Total Due Of Street Light	19,148,225.04	24,573,125.04	32,942,385.04	45,707,025.64	55,097,719.24	47,014,434.59	56411154.59
6	Total Due Amount Without Street Light	32,070,408.72	37,440,593.55	40,268,120.99	46,107,218.49	45,156,150.12	67,995,242.77	66,115,682.33
7	Average Collection Period Without Street Light	125.60	141.28	142.73	156.20	153.08	217.45	197.45
8	Stock Turn Over Ratio	0.856	0.917	0.837	0.884	0.709	0.736	0.830
1	Stock Balance	10,456,974.30	9,845,624.20	12,254,560.22	10,146,426.51	15,487,384.40	12,565,924.35	9441588.4
2	Store Expenditure	8,954,621.30	9,024,897.20	10,254,898.20	8,973,458.50	10,987,384.88	9,250,438.50	7,836,952.50
9	Details Of New Connection	Done	Done	Done	Done	Done	Done	Done
10	C.W.I.P	NILL	NILL	NILL	NILL	NILL	NILL	NILL
11	Report and Data Management	Yes	Yes	Yes	Yes	Yes	Yes	Yes