CHAPTER I

Introduction

1.1 Focus of the study

This study will provide an overview of Nepal Electricity Authority. It will also include generalize knowledge of Nepal Electricity history and similar operational functions. The study is intended to analyses and examines the cash flow system of Nepal Electricity Authority. Cash flow analysis is an important task since it helps to predict future cash flow and is involved in various economics decisions.

Some research has concluded that the predictive ability of earnings outer forms that of cash flows in forecasting future cash flows. They concluded each accrual component reflected different information relating to future cash flows. Moreover, most research has focused narrowly on operating cash flow, earnings and accrual components of earnings. Those previous studies have ignored the potential of other cash flow variables. Particularly cash flow ratios. Cash flow ratios are calculated by using data form both the cash flow statement prepared on a cash basis and the income statement and balance sheet based on the accrual basis. A cash flow ratio is a tool for analyzing a firms' performance.

Most of the researchers have estimated cash flows by adjusting income from income statement, whereas little research has used actual cash flow data from cash flow statement. To analysis cash flow, cash flow data directly derived from the statement, the cash flow data employed in research analysis should be directly derived from the cash flow statements instead of proxy cash flow measures calculated by using data from accrual based statements. Here, for the analysis and examine the cash flow of NEA, actual data from cash flow statement of NEA is obtained. NEA is one of the largest public enterprises in Nepal. It deals with generating and supplying of electricity.

The development of electricity in Nepal has been basically based on the development of the hydropower. The development of this infrastructure has been essentially carried by the Government but the private sector has recently also contributed and set qualitatively important footing in the sector.

1.1.1 An Overview of Nepal Electricity Authority (NEA)

During the sixty five year plan (1980 – 1985), the Government established Nepal Electricity Authority by introducing new corpora ration policy with the vision to boost up performance of public enterprises. Nepal Electricity Authority was established under the Nepal Electricity Authority Act 2041.Nepal Electricity Authority started its operation on 17th august 1985 (Bhadra 1, 2042) through the merger of the department of Electricity of Ministry of Water Resources , Nepal electricity co operation and related developments boards . Nepal Electricity Authority is responsible to generate and supply of electricity securely, efficiently, economically and legally at responsible price for the development of the nation.

The objectives of Nepal Electricity Authority are planning, construction, operation and maintenance of the electric power sub sector. Nepal electricity Authority should ensure the availability of the resources necessary for the development of electricity supply by the most efficient and effective manner.

The primary objectives 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.

1.1.2 Present Performance

NEA presently serves 1,060,700 customers (a growth of about 9.28% over that of the previous Fiscal year) across all the 75 districts of the country. Electricity supply is provided through ten medium – sized and forty small hydro power plants owned by NEA and ten hydropower plants others. Besides, four diesel and two multi-fuel thermal power plants under the ownership of NEA also cater to the demand .in terms of installed capacity of NEA's integrated grid, hydroelectricity power accounts for 549.553 MW (including 147.083 MW under the private ownership) and thermal power , 56.69 MW . during the time of deflect ,the power up to 50 MW is imported from India as per the Indo – Nepal Power Exchange Agreement .Nepal and India have agreed in the principle to increase this level of exchange from the existing 50 to 150 MW. Nepal is also entitled to 70 million units of energy annually from Tanakpur in

the far west under the Mahakali Treaty and 10 MW power according to Koshi contract .although the integrated gird has a total of 549.553 MW installed hydropower stations during the winter season when the power demand is as its peak.

In the area of transmission and sub-transmission of electricity, the NEA system has grown into a network of more than 1565 km of 132 kV, more than 420km of 66kv and around 2500km of 33 kv power lines. Distribution and customers services are provided with line around 800km of 11 kv. in keeping with the Nepal Government‘s policy of extending electricity service to the district headquarters, all the headquarters of the 75 district of the country are provided with electricity. the remaining areas are being progressively electrified .in order to accelerate the pace of expansion and conduct management of rural distribution system in a sustainable manner, NEA has adopted a concept of community participation in rural electrification schemes .the over helming response from groups and cooperatives to NEA’s invitation for proposal s on operating the distribution system by the community themselves has led to 80 agreements already in place.

NEA continues to be the sole purchaser of power production. To date, twenty six (26) PPAs totaling 216.047 MW has been concluded, of which 147.083 MW have already been commissioned. Out of 16 projects for which PPAs are concluded, 14 projects are expected to be commissioned by FY 2009/10 resulting in augmentation of generation capability by 58.764 MW. Another 36 requests for PPAs amounting to 81.031 MW of power are under scrutiny.

1.2 Statement of Problems

Success of any business enterprise is measured by capacity of surplus generation but the financial performance of manufacturing enterprise in Nepal are quit dismal and have not been able to contribute towards to generation of surplus.(Patha j.k. vol 13)
NEA, as a largest authority body in the country with countries high capital investment, is a leading public enterprise functioning in public utility sectors.NEA has to play a great role then other public enterprise. All manufacturing industries depend on the power supplied by it. For this sense unlike other PEs. It has no difficulty in selling its products and services as demand of electricity at different part of country. It is facing very little or no market competition, enjoying almost full monopoly over distribution services.

Although, it is a leading enterprise of power sector.It is facing so many problems. There are so many operational and managerial problems. The standard power loose of an electricity company generally accepted is 15%, while NEA is experiencing nearly 30% of power supply. It is due to lack of appropriate technology installment to cut of suck outage lack of modernize power supply system which is resulting in continuous load lost has played a vital role in cutting NEA's revenue. So nowadays NEA has been suffering from loadsheding problem.

The demand and use of energy have been gradually increasing in Nepal. Number of consumer is increasing every year. In comparison with last fiscal year the no. of consumer increased by 9.28% and reached in fiscal year 2010/2011, 1070800 consumers. This indicated that supplies not sufficient to fulfill the increasing demand of electricity.

Like other companies, Nepal Electricity Authority has also some weakness in maintaining cash flow. Cash flow guides in handling the cash. The study mainly aims to analyze and to solve the following research problem:

1. Are there any shortcoming with planning practice and its implementation?
2. What kinds of tools and technique are adopted for cash flow?
3. What are the problems faced by Nepal Electricity Authority in cash flow system?
4. How can cash flows be used to predict future cash flow of Nepal Electricity Authority?

1.3 Objective of the Study

The present study has been conducted to examine cash flow of public manufacturing enterprises of Nepal, on the basis of the case study of Nepal Electricity Authority. It will focus on the investment decision of the company and in particular the cash flow in short run business operation of the firms, i.e. management of the individual current assets like; cash and bank balance, receivable and inventory in the short –run.

1. To analyze the cash flow statement of Nepal Electricity Authority.
2. To evaluate utilization of assets and resource of Nepal electricity Authority.
3. To analyze the allocation for the expenditure of cash flow of Nepal Electricity Authority.

1.4 Significance of the Study

Analysis of cash flow is a vital part of the business enterprises. Poor system of cash flow adversely affects planning cash management of the organization. Thus, periodical analysis and review of cash flow is necessary in order to ensure smooth functioning of the organization .cash flow is the key to productive financial planning. The present study is intended to analyze and evaluate the cash flow system and its application in Nepal Electricity Authority regarding what can be done for the future prediction of cash inflow and outflow.

1.5 Research Hypothesis

The following research hypotheses have been formulated in relation to the research questions:

Research Hypothesis 1: Past earnings have significant predictive power in predicting future cash flows of Nepal Electricity Authority.

Research Hypothesis 2: Past cash flows are significant predictors of future cash flows of Nepal Electricity Authority.

1.6 Limitations of the study

There are three possible limitations of this research, which will call for clarification in the following specific areas. These limitations affect the generalisability and validity of this research.

1. Firstly, due to its focus on actual cash flow data from the statement of cash flows, this research studies Public institution of Nepalese market. The data employed in this research is only available for the fiscal years 2006/2007 to 2011/2012 i.e. six years data have been taken for the study .therefore ,this research may experience problems due to the inadequacy of the data
2. Secondly, this research may not be generalized to all public companies.
3. Finally, secondary data has been used in this study .

1.7 Organization of the study

The research study has been divided into the following five chapters:

Chapter 1 introduction

Background information on the subject matter of research undertaking will be presented under this section to provide a general idea of its history .so this section includes a brief introduction to Nepal electricity authority , role and objective of Nepal electricity authority in Nepalese economy. Statement of problem objective of the study comes next followed by scope and limitation of the study.

Chapter 2 review of literature

This chapter will include the review of relevant previous writing and studies to find the existing gap. Review of textbooks, dissertation these has been include.

Chapter 3 research methodology

In this chapter ,the method employed to gather data and the tools used in its interpretation has been described under the heading research design the population and sample ,nature and sources of data and financial and statistical tools to analyze it.

Chapter 4 data presentation and analysis

This chapter is one of the most important and core of thesis .since it consist of systematic presentation and analysis of financial statement employing financial and statistical tools.

Chapter 5 summary, conclusion and recommendation

This chapter is also important part of the study where major finding has been summarized conclusion drawn and viable recommendation suggested .it summarizes the whole study.

CHAPTER II
Review of Literature

Review of literature is an essential part of all studies. It is a way to discover what other research have been done. It is also a way to avoid investing problems that have already been answered. It helps researcher for completion of the study. Moreover previous studies provide basic guideline that directs way of doing the research. It refers to the reviewing of the past studies in the concerned field. The purpose of literature of review is, thus, to find out what research studies have been conducted in one's chosen field of the study, and what remains to be done. Cash flow statement is the next step in the accountancy. It has replaced the concept of funds flow statement.

2.1 Conceptual Framework

Funds can be categorized in two types; either in the form of working capital or in cash. If the fund is considered as working capital then we have to prepare funds flow statement and if the fund is taken as cash then we have to prepare cash flow statement. Cash flow statement is the main body for the cash flow analysis. Fair analysis of cash can only be done with the cash flow statement. Funds flow statement describes the sources of funds, amount of funds and the use of funds. Cash flow statement is designed to convert the accruals basis of accounting used to prepare the income statement and balance sheet back to a cash basis.

Cash is the most important part of any business organization without which business cannot be operated. Cash is a ready money in the bank or in the business. It is not inventory, it is not accounts receivable and it is not property but they can be converted to the cash at some point in time. A business must have an adequate amount of cash to operate. So, analysis of liquidity position is an important aspect of business organization. Cash flow statement is the reconciliation of opening and closing of cash. It is a statement of company's ability to generate cash from various activities such as operating, investing and financing activities.

Cash flow analysis provides useful information to an evaluate a firm's ability to have sufficient cash in both short term and long term basis. It is the analysis of the events and transactions that affects the cash position of company. Cash flow analysis is done through statement of cash flows. Cash flow analysis helps to evaluate financial policies and cash positions. It assesses a company's ability to generate positive future cash flows. It helps in evaluating firm's ability to meet its obligation, its ability to pay dividends and its need for external financing. Through past trends of cash flows, one can analyze, evaluate and predict future cash flow which is the ultimate goal of the study.

2.2 Funds Flow Analysis

The efficiency of the firm is reflected in the inflow and outflow of funds in the business. To understand the operational efficiency of the business concerns, it is necessary to have an analysis of the dynamic aspects of the flow of funds, and such an analysis made through funds flow analysis by preparing a statement is called funds flow statement (Dongol,Ratna Man, 2001). It is a statement which shows the movement of funds.

Funds flow statement describes the sources from which additional funds were described and the use to which these resources were put. Therefore, the main purpose of funds flow analysis is to get clear information about the financial transactions that brings changes in the company's resources. It is a king of financial tools which answers the following questions:

1. From which source fund received?
2. How many funds received?
3. For what purpose the fund is used?
4. Whether the business is solvent or not?
5. How can a profitable business be running on low cash and working capital?

2.3 Funds flow and Cash flow

There are differences between funds flow and cash flow. They are:

1. Funds flow deals with the change in working capital positions but cash flow deals with the change in the cash position between two points of time.
2. Funds flow does not start with any operating balance but cash flow starts with balance of cash in hand of the beginning period.
3. Funds flow is statement is relevant is estimating the firm's ability to meet its long term liabilities. However cash flow statement is more relevant in estimating the firm's capacity to meet its liability maturing after the short terms period of time.

2.4 Profits and Cash flow

Profit is the amount of money expected to make if all customers paid on time on and if expenses were spread out evenly over the time period being measured (Joshi and R.N., 1997). It is not day-to-day reality. Cash is needed to keep the doors of business open, while the organization is busy trying to make a profit. Over time, a company's profits are of little value if they are not accompanied by positive net cash flow. An organization can't spend profit. It can only spend cash. Profits are accounting measures that may not reflect the economic reality of the firm. Increasing profits will not always result in higher stock prices. Profits of the firm depend on many factors such as depreciation, non operating gains and losses. Cash flow analysis not only recognizes the profit but it measures the actual cash available for the firm. It is the availability of the cash not the profit that determines the firm's future investment and growth. Cash flow provides economic impact in managerial decisions.

2.5 Cash flow statement

The cash flow statement is the accounting report that provides information about cash receipts, cash payments and net change in cash balances during the period.

Previously, companies were required to present a fund statement that reported sources and uses of funds. Funds can be defined in three ways, including cash, working capital and total resources. Funds presented on fund statements are interpreted as working capital which is measured as current assets less current liabilities, whereas funds reported on cash flow statements of cash flow are defines as below:

Cash comprises cash on hand and demand deposits. Cash equivalents are short-term, highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value (Khan and Jain, 1993)

Cash flow statements replaced the fund flow statement for two main reasons. First, it resolved disputes over the definition of funds, and the purpose and presentation of the fund flow statement. The fund flow statements were not considered to provide sufficient information for funds used. Secondly, they improved the reliability and usefulness of reported financial information. Moreover, they omit the effects of some transactions that may be very important. In addition, the accounting standard for fund flow statements had not been revised for many years. Cash flows on the cash flow statement must be identified with three main activities of enterprises as required. These are cash flow from operating, investing and financing activities. The basis for the classification is derived from operating and financing activities. The basis for the classification is derived from the finance theory, that is, enterprises derive the cash used for investing activities and settlement of outstanding financial obligations in an accounting period from internal and external sources. Internal cash resources originate from the net cash generated from current operations. External cash resources come from financing activities such as borrowing and receiving cash from the sale of equity shares. Operating activities are the main activities involved in the revenue producing activities of the company and other activities that are not investing and financing activities. Investing activities involve the acquisition and disposal of long-term assets and other investment except short-term investments.

Financing activities are activities that result in changes in the size and composition of the equity capital and borrowings of the enterprise. Cash flows from operating activities can be reported by two methods, the direct or indirect method. The direct method shows cash receipts from customers and cash payments to suppliers, employee, government and other creditors. The indirect method starts with net profit or loss based on the accrual basis and adjusts for the effect of non cash transaction such as depreciation and amortization expenses, and changes in current assets and liabilities. The indirect method is preferred over the direct method. The indirect method reflects conversion from accrual-basis profit to cash-basis profit. In other words, it shows the association between the cash flow statement and two financial statements based on accrual basis, that is, cash flow from operations relate to revenues and expenses on income statements, and the current assets and liabilities on balance sheets (Jain and Narang, 1989). Therefore, a reason for supporting the indirect method is that it is more informative than the direct method because it emphasizes the difference between net income and operating cash flow, which can reduce the ability

of management to manipulate the income statement. The company must generate sufficient cash from its operating activities to finance its daily activities. Moreover cash flows from operations primarily support capital expenditures and dividends. If the company cannot generate any cash to reply loans, pay dividend or make new investments, the company would lend cash from external sources, causing future cash outflows. Cash available for investments and external financing shows the firm's ability to make new investments. It also indicates to inverters the dividend-paying ability of the firm. In addition, the cash flows from operations can be used to evaluate the quality of profits on income statements. The difference between net cash flow operations and net profits and cash flow from operations increase in cash flows from operations. This may result from increase in sales on credit, causing increases in accounts receivable, indicating that the company may have a cash collection problem in the future.

2.6 Importance of cash flow analysis

Firm need cash to conduct its operation. Thus it is very important to know the cash position of the firm and to know the cash position. It is important to analyze cash flow of the firm. Cash flow analysis also provides various useful information which can be helpful for various purposes. Nowadays, the cash flow statement is accepted as a necessary component of complete financial reporting by national and international accounting standard setters; because financial statement users note that the balance sheet, income statement and retained earnings statement do not always show the financial condition of a company. Also profit in the income statement does not reflect an increase in cash. Moreover, the profitability and financing issues are reported separately on income statements and balance sheets respectively. This causes misleading and confusing results to users. The requirements of cash flow statements are based on the assumption that past cash flows are useful for assessing future cash flows and the cash flow statement supplement and presents (Wagle and Dahal, 2006). According standard setters claimed that the cash flow statement used in conjunction with other financial statements, the balance sheet and income statement, provides the following perceived benefits:

1. It presents an insight into the changes in net assets of a company, financial structure (including its liquidity and solvency).
2. It shows the ability of a company to generate cash and cash equivalents.

3. It is usually used as a sign of the amount, timing and certainty of future cash flow.
4. It is a useful in checking the accuracy of the past assessment of future cash flows and in examining the relationship between profitability and net cash flow and the impact of changing prices.
5. It helps to predict future cash flow of the firm.
6. It determines utilities of the resources and guides to generate cash inflows through optimal investment and financing.
7. It determines utilities of the resources and guides to generate cash inflows through optimal investment and financing.
8. It helps to predict future cash flow of the firm.
9. It determines utilities of the resources and guides to generate cash inflows through optimal investment and financing.
10. It gives the answers of why the firm is continually short of cash even if a company operates at profit.
11. It acknowledges on how a company is in a loss and still generates huge cash inflows.

2.7 Preparation of cash flow statement

Analysis of cash flow is done through preparing cash flow statement. Cash flow statement is prepared on the cash basis of accounting (Wagle and Dahal, 2006). While preparing cash flow statement it is important to derive cash flow operating activities, investing activities and financial activities very carefully so that true figure would come. While calculating operating profits, adjustment for prepaid and outstanding expenses and income are made to convert the data from accrual basis to cash basis. The statement is prepared by taking all the inflows of cash and deducting all outflows of cash from the total and adding opening balance of cash to it.

2.7.1 Cash from Operating Activities

The amount of cash flows arising from operating activities is a key indicator of the extent to which the operations of the enterprise have generated sufficient cash flows to reply loans, maintain the operating capability of the enterprise, paying dividends and make new investments without resources to external source of financing. It relates

to a company's primary revenue generating activities, operating activities are always within the management control and they provide base for management estimation of fund needed to rise from available sources. Cash flow from operating activities is generally the cash effects of transactions and economic events included in the determination of income. Cash from operating activities includes:

a. Cash receipts from sale of goods and rendering of services
b. Cash receipts from royalties, fees and other revenues.
c. Cash payments to suppliers for goods and services.
d. Cash payments to employees
e. Cash payment to insurances as a premium
f. Cash receipt from claim of insurance
g. Cash payment as interest expenses
h. Cash payment for income tax

2.7.2 Cash from Investing Activities

All the cash flows from investing activities can be determined by the long term assets and investment of two accounting periods. Any increase in assets shall be considered as having purchased and cash paid for it unless any information contrary to the same is provided. At the same time, decrease in assets account the sale of those assets and cash inflows unless information opposing to that is provided. The gain or loss on sale need to be adjusted to calculate the exact amount cash received .cash from investing activities includes:

a. Cash receipt from the sale property , plant and equipment
b. Cash payment to acquire property ,plant and equipment
c. Cash payment to purchase of equity and debenture
d. Cash receipt from sale of equity and debenture

2.7.3Cash from Financing Activities

Cash flow from financing activities are calculated by analyzing the liabilities side of the balance sheet. The amounts of secured loans, unsecured loans, the amount of the share capital and retained earnings accounts are analyzed to calculate the inflows and outflows from financing activities. The increase in this amount can be taken as inflow

and the decrease in these amounts can be taken as outflow. Besides capital and loan amounts another financing activities is divided paid or drawings by the owners. Divided may in form of cash dividend or stock dividends. Since stock dividends do not deal with cash, only cash dividend should be considered for cash flow statement. Cash from financing activities includes:

a. Cash receipt from the issue of shares/debentures
b. Cash payment to redeem preference share/debentures
c. Cash receipt in term of loan taken
d. Cash payment for borrowing of loan

There are two methods of preparing cash flow statement:

1. Indirect method
2. Direct Method

Indirect Method

Under this method, cash flow statement is prepared by taking income of the year. The cash from operating activities is derived by preparing funds from operation and adjusting it by adding or subtracting net increase / decrease in current assets or current liabilities excluding cash as shown in the table below. Cash from investing activities is derived by deducing purchase of fixed assets or investment. Similarly cash from financing activities is derived by deducing dividend paid, redemption of shares/debentures from issue of share/debentures as discussed in above.

Format of Cash Flow Statement under Indirect Method is:

Table 1

Format of Cash Statement under Indirect Method

Particulars	Amount
Cash from Operating Activities (CFOA)	
Provision for dividend	
Interim dividend (if any)	
Profit transfer to balance sheet	
Profit for the year	
Add. Non cash and non operating expenses:	
Depreciation for the year	
Amortization of intangible assets	
Amortization of fictitious assets	
Loss on sale of fixed assets	
Discount on issue of share / debenture	
Premium on redemption of preference share/debenture	
Less : Non operating gain :	
Gain on sale of fixed assets	
Premium on issues of share /debenture	
Discount on redemption of preference share/debenture	
Extra gain (if any)	
Funds from operation (FFO)	
d. Decrease in working capital expect cash (item wise)	
Decrease in current assets	
Increase in current liabilities	
Less :increase in working capital except cash (item wise)	
Increase in current assets	
Decrease in current liabilities	
A Cash from Operating Activities (CFOA)	

B. Cash from Investing Activities(CFIA) Add: Sale of fixed assets /investment Less: Purchase of Fixed assets /investment b.Cash from investing Activities (CFIA) **C. Cash from Financing Activities (CFFA)** Add: issue of shares/debentures Less: Redemption of preference shares/debentures Less: dividend paid (last year Less: Interim Dividend (if any) c. Cash from Financing Activities(CFFA) Net Cash Increase /Decrease (A+B+C) Add: Opening Cash /Bank balance **Closing cash /bank balance**	

Direct Method

Under this method, cash flow statement is prepared by taking sales revenue. It shows cash collected from customer and deducted cash used for various expenses. Here, major of class of gross cash receipt and gross cash pavements are disclosed. Basically computation of cash from operating activities is only differ from indirect method .while deriving cash from operating activities , expenses related to the purchases, operating activities , interest , tax etc are deducted from sale revenue and collection from customers. The derivation of cash from investing and financing activities are similar to the indirect method.

Format of Cash Flow Statement under Direct Method is

Table 2

Format of Cash Flow statement under Direct Method

Particulars	Amount
A. Cash from Operating Activities(CFOA)	
Sales and Collection from customers:	
Sales revenue(net)	
Add: Decrease in debtors	
Less: increase in debtors	
Add: Decrease in provision for doubtful debt	
Less: increase in provision for doubtful debt	
Less: Doubtful debt written off	
Add: bad debt recover	
(a)	
Purchase and payments to creditors :	
Total cost of goods sold	
Add/less: Inventory	
Add/less : creditors	
Add / less: outstanding wages	
(b)	
Cash Operating expenses:	
Total cash operating expenses	
Add/less : outstanding expenses	
Add/less: prepaid expenses	
(c)	
Interest expenses :	
Total interest expenses	
Add/less: outstanding interest	
Add /less: Prepaid interest	
(d)	
Tax Expenses	
Total tax payment	
Add/less: Provision for tax Add/less : prepaid tax	

(e) Cash from operating activities before extra ordinary items :(a-b-c-d-e) Add /less :bank overdraft Add/less: Marketable securities A. cash from operating Activities (CFIA) **B. Cash from investing Activities (CFIA)** Add: sale of fixed assets/investment Less: purchase of fixed assets/investment B. Cash from Investing Activities(CFIA) **C. Cash from financing Activities (CFFA)** Add: issue of shares/debentures Less :Redemption of preference share/debenture Less: dividend paid (last year) Less: interim Dividend (if any) C. cash from Financing Activities (CFFA) Net Cash increase /Decrease (A+B+C) Add : opening cash / bank balance **Closing cash / bank balance**	

2.8 Cash Flow Ratios

Financial ratio analysis is a tool used in financial statement analysis. Financial ratios can be used to predict financial variables and to evaluate relative performance such as predicting bankruptcy, stock prices and the profanity of loan defaults. Ratios are developed to help users of financial statement compare performances of companies on a year-to – year basis and across companies. Cash flow statements provide new measures to evaluate firm performance. The concept of cash – based performance ratio had been used in financial analysis before the regulation of reporting cash flow statements. In that time, surrogate of cash flow were used, such as net incoming plus depreciation. Resulting in a lack of uniformly and misdirected analysis. Currently statements of cash flow have the ready availability of cash flow data with consistent performance measures of cash flow from operation.

Cash flow ratios are based on the cash flow from the operation (CFO) of the company. Also, ratios can contain accrual – based accounting data. The cash flow ratios provided a clearer picture of a company's performance, highlighting an

organization's cash flow strengths and weakness. Cash flow ratios could be a better measure of firm performance than financial ratios from income statements and balance sheets because cash flow from operation as a main component of the, exclude the effect of non cash flow item such as deprecation expenses and gain or loss on the sale of operating assets. It has been argued that the traditional ratio from income statement and balance sheet such as the liquidity ratio and quick ratio may not provide a comprehensive measure of a company's ability to retire its debts because current asset, including accounts receivable and inventory, may not be converted into cash.

Cash flow ratio may be categorized into groups; cash flow sufficiency and cash flow return ratios as described below:

2.8.1 Cash flow sufficiency ratios

Cash flow sufficiency ratios are aimed at assessing a company's relative ability to generate sufficient cash to meet its cash flow needs. All ratios indicate whether company's cash flows are sufficient for the payment of debt, acquisition of assets and payment of dividend. These ratios are:

i.Cash flow adequate ratio

The cash flow adequacy ratio is an attempt to assess the entity's ability to produce sufficient operating cash flows to cover its main cash requirement, specifically, the payment of debt, the acquisition of assets, and the payment of dividends.

$$Cash\,Flow\,adequacy = \frac{Cash\,Flow\,from\,operations}{repayment\,of\,borrowing - Assets\,acquired - Dividiends\,Paid}$$

ii. Debt coverage ratio

The debt coverage ratio shows the ability of a company to generate cash flow from operating activities to pay its long-term debt commitment.

$$\text{Debt coverage ratio} = \frac{Total\,Debt}{Cash\,flow\,from\,operations}$$

iii. Repayment of borrowing ratio

This ratio indicates the ability of a firm to generate cash from operating activities for the purpose of covering long – term debt commitments in the current year.

Repayment of borrowings ratio = $\frac{Repayment\ of\ Borrowings}{Cash\ flow\ from\ operations}$

iv. Dividend payment ratio

The dividend payment ratio presents the ability of a company to generate cash from operating activities for the purpose of covering dividend commitment to both ordinary and preference shareholders. If the ratio is grater, it means that the company paid a smaller portion of cash from operating activities in dividend payments.

Dividend payment ratio = $\frac{Divident\ Paid}{Cash\ Flow\ from\ operation}$

v. Reinvestment ratio

The reinvestment ratio presents the ability of a company to generate cash from operating activities for the purpose of covering asset acquisition payments.

Reinvestment ratio = $\frac{Payment\ for\ Property,\ plant\ and\ equipment}{cash\ flow\ from\ operation}$

2.8.2 Cash flow return ratios

This group is sometimes called efficiency ratios. It shows the ability of a company to generate operating cash flow efficiency ratios are used to assess the relationship between items in the income statement and balance sheet with cash flow from operations as disclosed in the cash flow statement .these ratio are as follows,

a. Cash flow on revenues ratio

This ratio is aimed at showing the ability of the company to turn revenue into cash. The higher the ratio, the better the ability. This ratio employs information provided by the statement of cash flow and the income statement. it is computed by dividing cash from operating activities by revenues.

Cash flow to revenues = $\frac{Cash\ Flow\ from\ Operations}{Revenue}$

b. Cash flow to net income ratio

This ratio is sometimes called the operating index. It compares the company's profit with cash flow from operations and attempt to provide and index of the cash- generating productivity of operations. It is calculated as cash flows from operation divided by profit after income tax.

$$\text{Cash flow to net income ratio} = \frac{Cash\ flow\ from\ operations}{Net profit}$$

c. Cash flow return on assets ratio

This ratio attempts to measure the company's return on assets in term of the cash flow generated from operations.

$$\text{Cash flow return on assets} = \frac{Cash Flow from Opeartions - Income tax paid - Interest}{Average\ Total\ Assets}$$

d. Cash flow return on stockholders' equity ratio

This ratio shows the ability of the company to generate sufficient cash return for stockholders'.

$$\text{Cash flow return on stockholders' equity ratio} = \frac{Cash Flow\ from\ operations}{Average\ Stockholder's\ equity}$$

e. Cash flow per share ratio

This ratio indicates the operating cash flow attributable to each common share. It is defined as cash available to common stockholders divided by the weighted average number of common shares outstanding.

$$\text{Cash flow per share ratio} = \frac{Cash\ flow\ from\ operation - preferred\ dividends}{Average\ number\ of\ shares\ of\ common\ stock\ outstanding}$$

2.8.3 Cash inflow to outflow ratio

Cash turnover ratio basically analyze the relation between cash inflow and outflow from operating, investing and financing activities overall. Higher the ratio higher will be the cash inflow and vice-versa.

$$\text{Cash inflow to outflow ratio} = \frac{Total\ Cash\ inflow}{Total\ Cash\ outflow}$$

2.8.4 Cash flow liquidity ratio

This ratio is used to test the company's short-term debt paying ability.

$$\text{Cash flow liquidity ratio} = \frac{Cash\ Flow\ from\ operating\ activities + cash/bank\ balance}{Current\ Liabilities}$$

2.8.5 Cash turnover ratio

Cash flow margin ratio measures company's ability to turn sales revenue into cash.

$$\text{Cash turnover ratio} = \frac{Cash\ and\ Bank\ balance}{Sales}$$

2.9 Review of Articles

There are various articles published regarding hydro i.e. water resources. Here we are reviewing some of the articles.

2.9.1 "Water Resources Development Nepalese Perspective" (2004), published by HDS study directors Bhekh B. Thapa and Bharat B. Pradhan is one of the important treatise in respect of the hydro power of Nepal. Some of the relevant findings are as follows.

1. Forest in Nepal provided more than 95 percent of the rural energy needs about 20-25 percent of the fodder for livestock and all the domestic timber needs.

2. Nepal's energy scenario refracts an imbalance between energy consumption and energy resources endowment.

3. The theoretical power potential of the water resources in Nepal is estimated to be about 83000 MW out of which 42,133 MW is estimated to be the output of technical and economically viable schemes. The installed capacity of hydropower station developed till now works out to less than one percent of the potential identified up to date. Thus, Nepal enormous potential of water resources to generate hydro power is in the early stage of exploitation.

1. Future development of agro industries and processing facilities would also need reliable supply of power. Storage type projects can substantially increase opportunities for large scale year round irrigation as well as hydro power generation for export and use in power intensive industries.
2. Development of water resources is essential in order to meets human needs like increasing agricultural and industrial, meeting energy needs and earning foreign exchange from power export.
3. The strategy for power development in Nepal should aim at maximizing the economic benefits from hydro power development through an optimum development of country's river basins. Optimum utilization of this resources calls for meaningful co-operation among the rivarian countries.
4. High investment requirement for the development of hydro power and the lack of financial resources are the major constraints at present.

2.9.2 Shrestha's (2002) book on "Hydropower in Nepal issues and concept of development", has noted to the following major finding

1. Major achievements in the economics development of the Nepal could be realized through proper harvesting of the vast water resources. But a nearly hundred percent dependency on overseas professions and a failure to gradually develop our own manpower prevents realization of this goal.
2. The opportunities in hydropower development do not connote nearly approaching new projects but also commitment to maintaining and optimizing the efficiency such opportunities means institutional development, but this has been grossly overlooked for obvious reasons
3. An alternative strategy for the hydropower development in Nepal would be to open the doors for privatization where there would be a chance for development through competition and decrease of bureaucratic control.
4. To demonstrate the assessments of conditions those have been made throughout history of development of hydro power in Nepal. Facts and figures suggest that many past mistake continue into the decision making process.
5. Because of improper information management, non-existent human resources development and myopic decision making, we have made ourselves

vulnerable to the dictates of outside help where terms are drawn up to the advantage of multinational funding agencies.

6. As the development of hydro power in Nepal has always been dictated by many constraints and conditions, projects are selected by planning procedure which is deliberately designed to produce a 'no option' situation in decision making.

2.9.3 HUGUS (1985) has presented an important report entitled "towards a power sector strategy". The main findings of this report are:

1. Existing power system in Nepal, is small, fragment and unable to meet the existing demand for electricity.
2. Lack of an abundant power supply aggravates the energy problems which are characterized by a high usage of firewood and disappearance of forest cover, and by a growing dependence on imported hydro carbons which is exerting pressure on the country's balance of payments situation.
3. Nepal has abundant water resources which are largely untapped. The cost of hydroelectricity at optimally sized plants located in the accessible areas of the main river basins is low compared to the thermal generation.
4. Development of hydro electricity resources could mitigate the energy problems, contribute to industrial expansion and increase export by direct sales of energy or by selective development for energy intensive industries.
5. While there is obvious need to develop the hydro electric resources, there are a number of constraints. The main constrain is the high capital investment required relative to resources available. Other constraints are lack of information for evaluation of alternative courses which could be followed in hydro power development. The next for international agreement on water sharing and the lack of trained manpower.

2.9.4 A comprehensive study done by the World Bank on "Nepal Power Subsection Review", (2006) is another useful document for the review. Some of the findings are as follows:

1) Nepal's power system is still in the early stages of development. The average consumption of electricity is 25kwh month which is one of the lowest in the world.

2) The Nepal power sub sector faces numerous impediments to its development, chief of which are the lack of well defined tariff policy and institutional weaknesses in the sub-sectors, primarily in the Nepal Electricity Authority (NEA) the national public power utility.

3) The efficient exploitation of this resource as one of the Nepal's most important economic priorities because of the need to reduce substantially the cost and improve the available power to the domestic market and the potential for export of competitively priced hydro power to India.

4) NEA needs to address three key issues,
   a) Improvement on NEA manager's understanding and application of basic utility management concepts and tools.
   b) Preparation of the corporate development plan.
   c) Improvement of conditions of services for its employees.

5) Electricity pricing should reflect the economics cost of supply to customers while satisfying social objectives and taking into account NEA's financial viability and financing requirement.

6) While load forecasting and generation planning are of a high standard at NEA, more attention needs to be paid to transmission, distribution and operational planning.

7) Although bulk export of competitively priced hydro power to India represents Nepal's most attractive medium and long term foreign exchange earning option. Government of Nepal does not yet have a detailed strategy to achieve this goal.

8) Only two percent of the rural population has access to electricity; however Government of Nepal does not give a master plan for rural electrification that should form part of a wider strategy of meeting rural energy need at least cost. Analysis indicates that carefully designated schemes can be cost effective, financially viable and competitive with alternative fuels.

2.10 Review of previous research work

Some researchers have already been made in the context of Nepal Electricity Authority. An attempt is made here to review some of the researches that have been submitted.

2.10.1 Koirala, (2006) has submitted his research report on "Managerial Budgeting as the tool of increasing efficiency of Public enterprises (A Case Study of Nepal Electricity Authority)". In his study he has pointed out following major findings and recommendations:

Major Findings

Actual sale are more fluctuating than budgeted sales and budgeted production is more fluctuating than actual production.

a. Nepal Electricity Authority has been paying huge amount of interest on long term loan.
b. Actual sales are always less than actual production due to power loss which is a main problem of Nepal Electricity Authority, which affects its profit.
c. Overhead are not classified systematically which create difficulty to analysis expenses effectively.
d. Account receivable and average collection period are in increasing trend during study period.

2.10.2 Shahi, (2008) has submitted his research report on "An analysis of revenue collection of Nepal Electricity Authority". In his study he has pointed out following major findings and recommendations:

Major Findings

a. Nepal Electricity Authority has not considered major demands departments of electricity such as family income, price of electricity, connection charges, and cost of alternative.
b. Nepal Electricity Authority has not adopted practice of preparing monthly budget
c. Nepal Electricity Authority has no practice of cost segregation.
d. Nepal Electricity Authority was unable to meet its BEP sales therefore it faces loss every year.
e. Nepal Electricity Authority has not maintained its periodic performance report systematically.

2.10.3 Bhattarai, (2006) has submitted his research report on "profit Planning in Nepal Electricity Authority". In his study he has pointed out following major findings and recommendations:

Major findings

a. The authority fails to maintain its periodic performance report systematically. Goals and objectives are limited only to the high ranking officials.
b. Specific goal and objectives are not conveyed to lower level staffs and it denotes the absences of MBO principle of management in the organization.
c. Only the top level executives are involved in planning and decision making and participation of lower level staffs is not encouraged.
d. Return on sales, acid test ratio and return on net capital employed are not perfectly satisfactory though total assets turnover ratio seems better.
e. NEA is suffering from high fixed cost.
f. Overheads are not classified systematically and it creates problem to analyze its expenses properly.
g. NEA is suffering from high rate of power loss. Sales are below than production in the range of 22-24% during the study period.

2.10.4 Thapa, (2008) has submitted his research report on "Profit Planning in Nepalese Public Enterprise: A case study of Nepal Electricity Authority". In his study he has pointed out following major findings and recommendations:

Major findings

a. NEA prepare both tactical and strategic profit plan but strategic plan is confined only to the level executives.
b. Achievement of capital expenditure budget is satisfactory.
c. Operating costs have not been controlled effectively during the study period.
d. NEA has not maintained sound liquidity during the study period.
e. NEA has not prepared plan and program for agriculture sector's consumption of electricity.
f. NEA has not considered demand determinates such as family income, price of electricity, connection charge, and cost of alternative available and reliability of NEA service while forecasting demand.

2.10.5 Mr. Sharma, (2009) has submitted his research report on "Profit Planning in Nepal Electricity Authority" in his study he has pointed out following major findings and recommendations:

Major findings

a. Actual sales was favorable than budget sale. Rate of the electricity per unit is cheaper in supply to India than internal sales price per unit.
b. There is absence of overhead budget.
c. NEA is paying huge amount of interest and is suffering from high fixed cost.
d. Revenue collection had also been one of the main problem as well as profitability and net profit ratios are not satisfactory.
e. Lack of the use of the concept of profit planning and control and lack of proper co-ordination among departments of NEA

2.11 Research Gap

The resent research is focused on cash flow analysis of NEA. No other research is made on cash flow analysis of NEA and neither previous researcher had made a study

on a relevant subject matter. This is the relation that the researcher focused to research on the subject matter so that the researcher can evaluate the performance of NEA from the perspective of cash flow analysis. Since, there was not found any research work on cash flow analysis of NEA, literature on the subject matter is not available. However, the researcher have gone through few research made on NEA with a different title so that this study have been new one. It is also said that, this study will be fruitful to those interested person scholar, students, teachers, civil societies, stakeholders, businessmen and government for academically as well as policy prosperities.

CHAPTER III

Research Methodology

3.1 General Meaning

Research methodology is the way to solve systematically about the research problem. It refers to the various sequential steps to adopt by a researcher in studying a problem with certain objectives in views (Kotheri, 1994). This study is carried out to analyze, examine and interpret the cash flows with the help of cash flow statement and using various accounting and statically tools. Systematically and planned way of collection, analysis and interpretation of data are made to solve the research problem and accomplish basic objective of the study.

In the previous chapter, the relevant literature, accrual and cash flow accounting, were reviewed. This chapter explains the methodology used to collect the data and best the research hypothesis. it introduce the outline of the chapter, justifies the paradigm chosen for this research , describes the research design and the method employed to achieved the outcomes of research. It also provides the definition of variables and measurements in the data analysis. It describes the model building, including earning, cash flow, cash flow and accrual components of earnings, and cash flow ratios model. It identifies the data specification including the period of testing, sampling selection and data source. Moreover it explains the validity of the research and finally, presents the conclusion of the chapter.

3.2 Research Design

A research design is a plan developed to achieve the research purpose. It is a plan structure and strategy to obtain answer to research questions through investigation and analysis. It aims to ensure the research can clearly answer the research problem, and involves systematizing the research activity, involving the collection of the data and analyzing the data (Wolf and Pant, 2005). A good research design can provide valid conclusions and suggestions from the research. This research aims to test the stated hypothesis and employs a qualitative method, because the research aims to investigate the ability of accounting data. Mainly secondary data are used in research that aims to test theory, particularly in accounting and finance areas.

3.3 Source of data

The significance of research depends on the nature, availability and accuracy of information. Thus, data collection is the major task of the research work. In this study based on secondary data will be used to fulfill the objectives of the study. The secondary data have been collected from the following main sources:

1. Annual report of NEA.
2. Profiles and magazines of NEA.
3. Published and unpolished articles.
4. Media.
5. Cash flow statement of NEA.
6. Previous studies made in this field.
7. Website (www.nea.org.np)

3.4 Tools and techniques for analysis

The main important part of the study is to examine, analyze and interpret the relevant data of the respected field and it is the difficult part as well. Thus, data should be examine and analyzed very rigorously. This research will utilize quantitative methods in which the data is analyzed based on statistical tools and techniques, which includes descriptive statics i.e. person's correction and regression analysis. These descriptive statistics provide an initial summary data of the essential feature of the sample. The correlation analysis is used to fundamentally examine the relationship between dependent and independent variables. Regression analysis is applied to test the prediction models depending upon the ability of predictor variables to explain the cash flows. On the other hands this research will utilize financial analysis to analyzed secondary data. For this purpose cash flow ratios will be used. Furthermore, the study uses cash flow statement to analyst cash inflow and outflow and to interpret and to evaluate a firm's ability to have sufficient cash in both short term and long term basis. As per requirements, the following tools and techniques are used in this study:

A .**Accounting tools**

As a accounting tools, various cash flow ratios have been used for the analysis of data. The cash flow ratios used in this study are:

i. Cash flow sufficiency ratios

Cash flow sufficiency ratios are aimed at assessing a company's relative ability to generate sufficient cash to meet its cash flow needs. All ratios indicate whether a company's cash flows are sufficient for the payment of debt, acquisitions of assets and payment of dividends. These ratios are:

- **Cash flow adequacy ratio**

The cash flow adequacy ratio is an attempt to assess the entity's ability to produce sufficient operating cash flows to cover its main cash requirement, specifically, the payment of debt, the acquisition of assets, and the payment of dividends.

$$\text{Cash flow adequacy} = \frac{Cash Flow\ from\ Operations}{Repayment\ of\ Borrowing - Assets\ acquired - Divident\ paid}$$

- **Debt coverage ratio**

The debt coverage ratio shows the ability of a company to generate cash flow from operating activities to pay its long-term debt commitment.

$$\text{Debt coverage ratio} = \frac{Total\ Debt}{Cash\ Flow\ from\ Operations}$$

- **Repayment of borrowings ratio**

This ratio indicates the ability of a firm to generate cash from operating activities for the purpose of covering long – term debt commitments in the current year.

$$\text{Repayment of borrowings ratio} = \frac{Repayment\ of\ Borrowings}{Cash\ flow\ from\ operations}$$

- **Dividend payment ratio**

The dividend payment ratio presents the ability of a company to generate cash from operating activities for the purpose of covering dividend commitment to both ordinary and preference shareholders. If the ratio is grater, it means that the company paid a smaller portion of cash from operating activities in dividend payments.

$$\text{Dividend payment ratio} = \frac{Dividends\ Paid}{Cash\ flow\ from\ Operations}$$

- **Reinvestment ratio**

The reinvestment ratio presents the ability of a company to generate cash from operating activities for the purpose of covering asset acquisition payments.

$$\text{Reinvestment ratio} = \frac{Payment\ for\ Property,\ plant\ and\ equipment}{Cash\ flow\ from\ operations}$$

ii. Cash flow return ratios

This group is sometimes called efficiency ratios. It shows the ability of a company to generate operating cash flows. Cash flow efficiency ratios are used to access the relationship between items in the cash flow statement. These ratios are as follows:

- **Cash flow on revenues ratio**

This ratio is aimed at showing the ability of the company to turn revenue into cash. The higher the ratio, the better the ability. This ratio employs information provided by the statement of cash flow and the income statement. it is computed by dividing cash from operating activities by revenues.

Cash flow to revenues = $\frac{Cash\ Flow\ from\ Operations}{Revenues}$

- **Cash flow to net income ratio**

This ratio is sometimes called the operating index. It compares the company's profit with cash flow from operations and attempt to provide and index of the cash-generating productivity of operations. It is calculated as cash flows from operation divided by profit after income tax.

Operation index = $\frac{Cash\ Flow\ from\ Operations}{Net\ Profit}$

- **Cash flow return on assets ratio**

This ratio attempts to measure the company's return on assets in term of the cash flow generated from operations

Cash flow return on assets = $\frac{Cash\ Flow\ from\ Operations + Income\ Tax\ paid + Interest\ Paid}{Average\ Total\ Assets}$

- **Cash flow return on stockholders' equity ratio**

This ratio shows the ability of the company to generate sufficient cash return for stockholders'.

Cash flow return on stockholders' equity ratio = $\frac{Cash\ Flow\ Operations}{Average\ Stockholder's\ Equity}$

- **Cash flow per share ratios**

This ratio indicates the operating cash flow attributable to each common share. It is defined as cash available to common stockholders divided by the weighted average number of common shares outstanding.

Cash flow per share ratios = $\frac{\text{Cash Flow from Operations} - \text{Preferred dividends}}{\text{Average number of shares of common stock outstanding}}$

iii. Cash inflow to outflow ratio

Cash turnover ratio basically analyze the relation between cash inflow and outflow from operating, investing and financing activities overall. Higher the ratio higher will be the cash inflow and vice-versa.

Cash in turnover ratio = $\frac{\text{Cash Inflow}}{\text{Cash Outflow}}$

iv. Cash from liquidity ratio

This ratio is used to test the company's short-term debt paying ability.

Cash flow liquidity ratio = $\frac{\text{Cash Flow from Operations}}{\text{Current Liabilities}}$

Cash turnover ratio

Cash flow margin ratio measures company's ability to turn sales revenue into cash.

Cash flow margin ratio = $\frac{\text{Cash and Bank Balance}}{\text{Sales}}$

B. Statistical tools

As statistical tools, the study has used following tools: (Bajracharya, 2004)

a. Correlation (r) = $\frac{n \quad xy \text{ Z} \quad x \quad y}{\sqrt{n \quad x^2 \text{ Z} \quad (x)^2}\ \sqrt{n \quad y^2 \text{ Z} \quad (y)^2}}$

b. Regression equation of x and y:

$$x \text{ Z} \overset{\text{z}}{x} \text{X} bxy \, (\overset{\text{z}}{y} \text{Z} y)$$

c. Regression equation of y on x

$$y \text{ Z} \overset{\text{z}}{y} \text{X} byx \, (\overset{\text{z}}{x} \text{Z} x)$$

Where,

$X = \overset{z}{x}(mean)$

$Y = \overset{z}{y}(mean)$

d. Trend line, y = a + bx

3.5 Population and Sample

A sample tries to draw conclusion about the pollution and the generalization are made. In other words, the samples are used as estimates of the population parameters. Hence, samples are the basis of our inferences about the pollution. Here, all the government organization such as Nepal Water Supply Corporation, Nepal Telecommunication, Nepal Oil Cooperation, Nepal Drugs Ltd, Nepal Trading Ltd, Salt Trading Ltd, Nepal Electricity Authority is taken as the sample for the study as it is one of the oldest and largest government company of Nepal and it provides a significant contribution in the field of electricity. It provides its services to all over the country. However, NEA is suffering from a huge loss. Thus, NEA has been considered as the sample for the study to analyze and evaluate its performance as well as the loss suffered by it from the view point of cash flow.

3.6 Methods of analysis and presentation

This research uses various formats and data table to present the data. The collected data from various sources are arranged, analyzed and presented in proper tables and diagrams. The data are explained with the help of different financial and statistical measures which are already discussed in the above part.

CHAPTER- IV

Presentation and Analysis of Data

4.1 Introduction

The previous chapter described the research methodology employed for this research. The chapter introduces the organization of the study; it summarizes the regression question and model of this study and discusses the data preparation before the analysis, including data arrangement.

The data presentation and analysis is the important part of the study because all the information and ideas will be analyzed and presented in this chapter. The basic objectives of this study have been already mentioned in the first chapter. The cash flow management aspects have disused in the review of literature. In this chapter efforts have been made to process the obtained data analyzed and interpret them. The main purpose of this study is to highlight the cash flow system of NEA. To accomplish this objective, this chapter of research paper will analyze the various aspect of cash flow and their related variances of the authority.

4.2 Analysis of Cash Flow

This statement of cash flow reflects the change in financial position from F/y 2006/07 to 20011/12, classifying transactions into three categories; operating, investing and financing activities. NEA prepares cash flow statement under indirect method that is most often used in annual reports. Under indirect method, net profit/loss is adjusted for the effect of transaction of a non-cash nature, any deferrals or accruals of pastor future operating cash receipts or payments and items of income or expenses associated with investing or financing cash flows. The following table shows the Cash Flow Statement of NEA during the study period.

Table 3
Cash Flow Statement of Nepal Electricity Authority from 2006/07 to 2011/12

(NRs in millions)

Particulars	**20011/12**	**2010/2011**	**2009/2010**	**2008/09**	**2007/08**	**2006/07**
A. Cash Flow from Operating Activities (CFOA)						
Provision for dividend						
Interim dividend (if any)						
Profit transfer to balance sheet	-4681.24	-1312.16	314.19	-1267.8	-1312.8	-1760.3
Net profit/loss for the year	**-4681.24**	**-1312.16**	**314.19**	**-1267.8**	**-1312.8**	**-1760.3**
Add: Non cash and non operating expenses:						
Depreciation for the year	2231.4	1920	1856.47	1816.9	1733.5	1686
Loss on foreign exchange	800.24	480.61	0	42.7	0	59.1
Provision for losses on property, plant and equipment	70	30	60	65	40	0
Deferred revenue expenditure written off	110	70	42.56	105.4	123.3	320.1
Less: Non operating gain:						
Gain on foreign exchange	0	0	0-493.39	0	-230	0
Funds Flow from Operation (FFO)	-1469.6	1188.45	1779.83	762.2	354	304.9
Add: Decrease in working capital except cash (item wise)						
Inventory				17.9		
Debtors	2010.82				38.01	
Prepaid/Advance			68.37			153.64
Creditors	1981.75	3498.71	2974.64	2375.7	2912.08	2262.92

Less: Increase in working capital except cash (item wise)						
Inventory	-337.96	-20	-143.65		324.69	-30.79
Debtors		-1625.29	-1063.41	-390.3		-355.51
Prepaid/Advance	-141.68	-49.94		-195.3	-35.33	
Creditors						
A: Cash Flow from Operating Activities (CFOA)	2043.33	2991.93	3615.75	2570.2	2944.07	2335.16
B. Cash Flow from Investing Activities (CFIA)						
Sale/Purchase of Property, Plant & Equipment	-26384.79	-512.34	-38.38	423.18	-751.12	1320.39
Sale/Purchase of capital work in progress	17876.36	-6785.55	-7153.69	-5931.1	-5440.85	-1964.07
Sale/Purchase of Investment	-718.14	-720	-62.15	-42.9	-63.99	-100
B. Cash Flow from Investing Activities (CFIA)	-9226.57	-8017.89	-7254.22	-5550.82	-6256.26	-3384.46
C. Cash Flow from financing Activities (CFFA)						
Add: Issue of shares/debentures	3858.68	2032.81	3269.08	2951.3	1945.95	1238.98
Add: Secured :Long Term Loan Borrowed	5455.59	5146.03	1128.24	1950.4	3434.37	1466.03
Less: Repayment of borrowing	2254.76	2779.62	569.87	1985.08	1781.95	1695.44
C.Cash Flow from Financing Activities (CFFA)	7059.51	4399.22	3827.45	2916.62	3598.37	1009.57
Net Cash Increase/Decrease (A+B+C)	-123.73	-626.74	188.98	-64	286.18	-39.73
Add: Opening cash/bank balance	820.84	1447.58	1258.6	1322.6	1036.42	1076.15
Closing cash/bank balance	697.11	820.84	1447.58	1258.6	1322.6	1036.42

Source: A year in review, NEA, f/y 2011/12 and annual report of NEA

4.3 Analysis of Cash Flow from Operating Activities (CFOA)

It includes all those activities which are main activities of a company. If the cash inflow is greater than outflow, it is considered satisfactory because it shows the company has sufficient cash to operate and bear all the expenses and overhead occurred during the operation but if cash outflow is greater than inflow then it is considered poor performance.

Net cash from operation activities of NEA was Rs.2335.16 million in F/y 2006/07 and in fiscal year 2007/08 it was increased to Rs.2944.07 million i.e. it is increased by 26.08% but is was decreased to Rs.2570.2 millions in fiscal year 2008/09i.e. decreased by 12.7%. It was due to increase in working capital i.e. increase in current assets and decrease in current liabilities. Again in fiscal year 2009/10 cash from operating activities increased by 40.67% to Rs.3615.75 million. It was the highest cash from operating activities obtained in the last 6 years and it was due to achieving net profit after a long period of time and also due to increase in current liabilities. However, NEA was again in loss in fiscal year 20010/11and in the same year current assets increased too. Thus CFOA had been decreased by 17.25% to Rs.2991.93 millions in fiscal year 2008/09 though there had been increased in current liabilities. In fiscal year 2011/12 it was Rs. 2043.33 million which was the result after decreasing by 31.71%.

The above interpretation of the data shows that NEA had excessive amount of non operating expenses. That is why NEA is facing loss in each year but able to generate cash inflow from operating activities. It was increased in fiscal year 2007/08 but decreased in 2008/09 and again increased in 2009/10 and decreased in 2010/11 and in 2011/12. It indicates that NEA fails to maintain increasing trend of CFOA. The reason behind this is NEA fails to obtain profit every year and doesn't give much important to current assets and current liabilities. However, the overall performance of the enterprise is satisfactory since it generates positive cash inflow from operating activities which ensures the ability of paying debts and investing in a hydro projects.

The CFOA of NEA during study period can be shown in a graphical representation as follows:

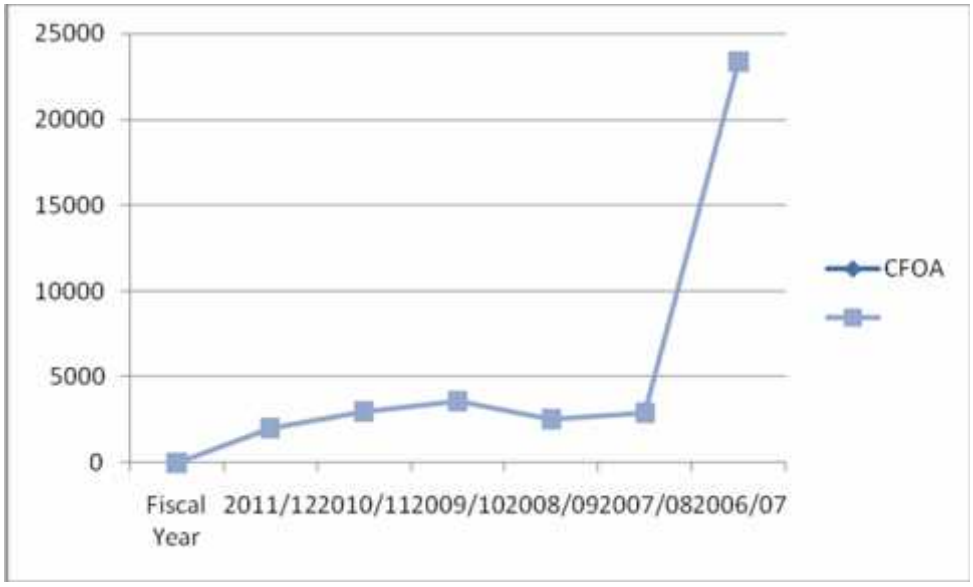


Figure 1: Analysis of Cash Flow from Operating Activities (CFOA)

The above interpretation of the data shows that NEA had excessive amount of non operating expenses. That is why NEA is facing loss in each year but able to generate cash inflow from operating activities. It was increased in fiscal year 2007/08 but decreased in 2008/09 and again increased in 2009/10 and decreased in 2010/11 and in 2011/12.Iindicates that NEA fails to maintain increasing trend of CFOA

4.4 Analysis of Cash Flow from Investing Activities (CFIA)

CFIA of NEA negative was observed during the study period. It was Rs. (3384.46), Rs. (6256.26), Rs.(5550.82), Rs.(7254.22), Rs.(8017.89) and Rs.(9226.57) million respectively in the following respective fiscal year 2006/07, 2007/08, 2008/09, 2009/10, 2010/11 and 2011/12. From the above figure it is seemed that CFIA was increased in fiscal year 2007/08 by 84.85% than in fiscal year 2006/07. It indicated that in fiscal year 2007/08, more fixed assets and investments purchased. In fiscal year 2008/09, CFIA decreased by 11.28% and it is due to the sale of plant and machinery. However, more purchase of plant and machinery as well as investments was made in fiscal year 2009/10, 2010/11 and 2011/12 and thus CFIA was increased by 30.69%, 10.53% and 15.07% respectively.

During the study period the main investing activities involve in acquisition of plant & machinery and investments. It states that NEA has enhanced future growth opportunities and was able to expand its services.

The CFIA during study period can be shown in graphical representation as follows

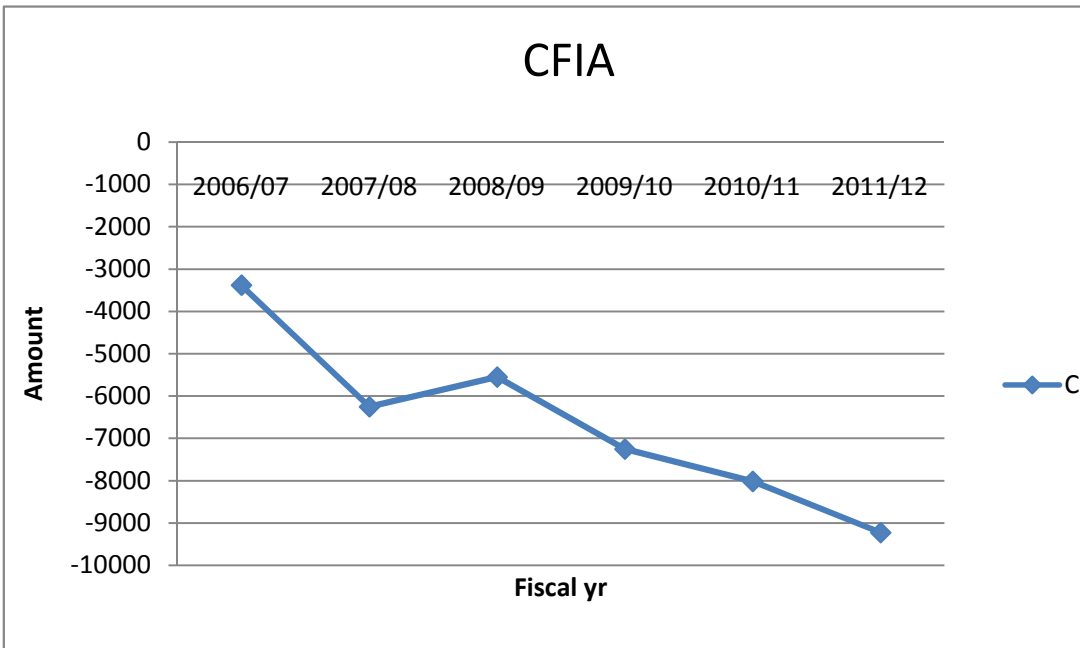


Figure 2: Analysis of Cash Flow from Investing Activities (CFIA)

The above figure shows that CFIA of NEA was observed negative during the study period. It was Rs. (3384.46), Rs. (6256.26), Rs.(5550.82), Rs.(7254.22), Rs.(8017.89) and Rs.(9226.57) million respectively in the following respective fiscal year 2006/07, 2007/08, 2008/09, 2009/10, 2010/11 and 2011/12. From the above figure it is seemed that CFIA was increased in fiscal year 2007/08.

4.5 Analysis of Cash Flow from Financing Activities (CFFA)

CFFA of NEA was Rs.1009.57, Rs.3598.37, Rs.2916.62, Rs.3827.45, Rs.4399.22 and Rs.7059.51 million in fiscal year 2006/07, 2007/08, 2008/09, 2009/10, 2010/11 and 2011/12 respectively. The amount increased by 256.43% in 2007/08 but it decreased by 18.95% in 2008/09 .It again increased by 31.23% in 2009/10 , by 14.94% in 2010/11 and by 60.47 in 2011/12 .The reason behind decrease in cash flow from financing activities can be redemption of preference shares/debentures and repayment of loan. Since NEA has not issue preference shares and debentures yet, the reason for decrease in CFFA in 2008/09 is repayment of loan. In that year, NEA has repaid huge amount of borrowing. In the remaining years, NEA has issued share capital every year

and the proportionate of borrowing of loan was higher than repayment of loan. That is why; CFFA was in increasing trend except 2008/09

It can be shown in graphical representation as follows:

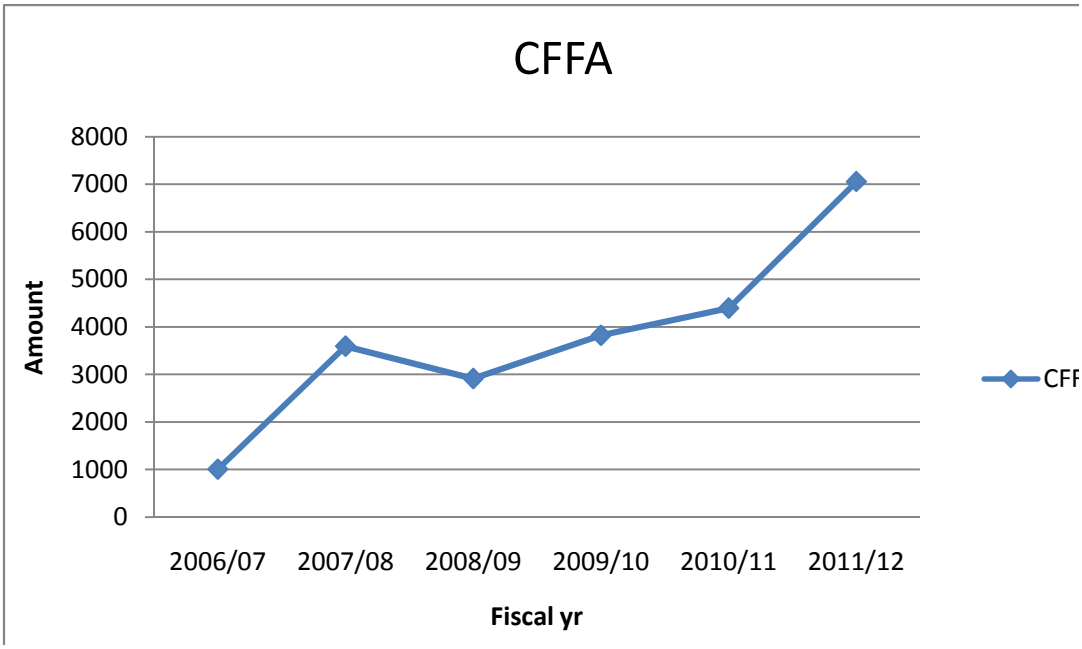


Figure 3: Analysis of Cash Flow from Financing Activities (CFFA)

The above figure shows that CFFA of NEA was Rs.1009.57, Rs.3598.37, Rs.2916.62, Rs.3827.45, Rs.4399.22 and Rs.7059.51 million in fiscal year 2006/07, 2007/08, 2008/09, 2009/10, 2010/11 and 2011/12 respectively. The reason behind decrease in cash flow from financing activities can be redemption of preference shares/debentures and repayment of loan. Since NEA has not issue preference shares and debentures yet, the reason for decrease in CFFA in 2008/09 is repayment of loan. In that year, NEA has repaid huge amount of borrowing. In the remaining years, NEA has issued share capital every year and the proportionate of borrowing of loan was higher than repayment of loan. That is why; CFFA was in increasing trend expected. 2008/09

4.6 Analysis of Net Cash Flow

The net cash flow of NEA was obtained from accumulating net cash flow from operating, investing and financing activities. The net cash flow of NEA was very fluctuating during the study period. It can be shown with the following trend line

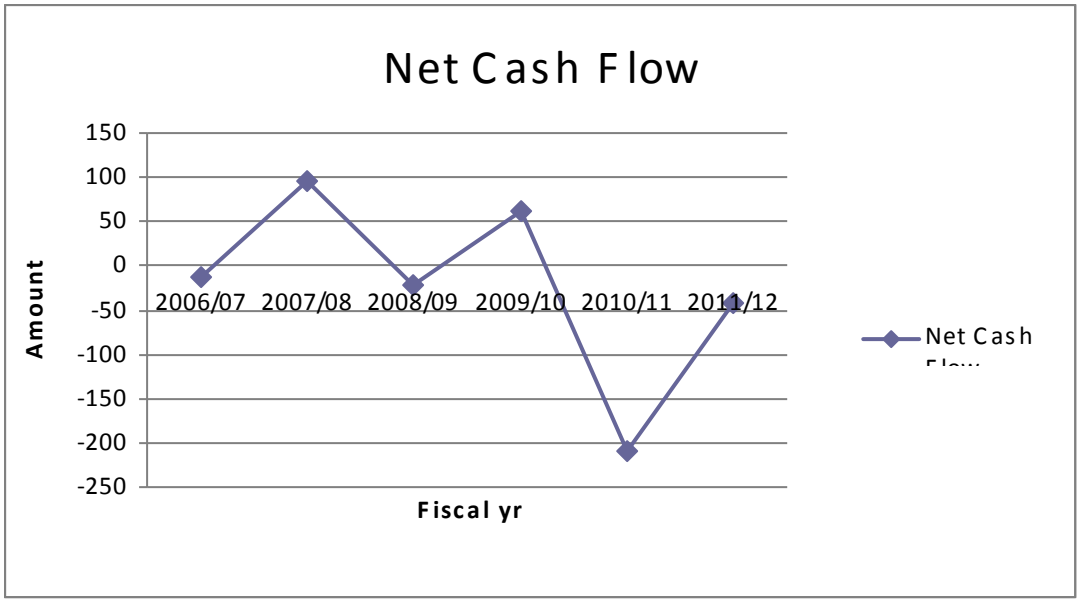


Figure 4: Analysis of Net Cash Flow

From the above trend line, it seemed that in 2010/11 net cash flow decreased in a heavy amount. It was due to the loss suffered by the enterprise. In that year, company suffered from a huge loss. However, it was quite recovered in 2011/12 but still it was negative. It can be concluded that the net cash flow increase in 2007/08 and 2009/10 but in 2010/11 there is rapidly decreased. It shows negative net cash flow.

4.7 Analysis of Profit and Loss

Profit refers to the amount which we get from income after deducting all the expenses. If income is greater than expenses, we obtain profit and vice-versa. Profit is the amount of money expected to make if all customers paid in time in and if expenses were spread out evenly over the time period being measured. Profits or the firm depend on many factors such as depreciation, non operating gains and losses. Simply it can be said that when manufacturing, selling, distribution and administrative cost are subtracted from sales revenue we achieve profit/loss. Profit and loss can be computed either by using profit and loss account or by income statement. Profit and loss a/c generally used by trading company and manufacturing company uses income statement. Thus, NEA has used income statement to calculate profit and loss.

However, profit has less value if the firm has negative cash flow. It is the cash not the profit which is required to operate the business. Profits are accounting measures that may not reflect the economic reality of the firm.Following table shows the profit and loss of NEA:

Table 4

Profit and loss of NEA

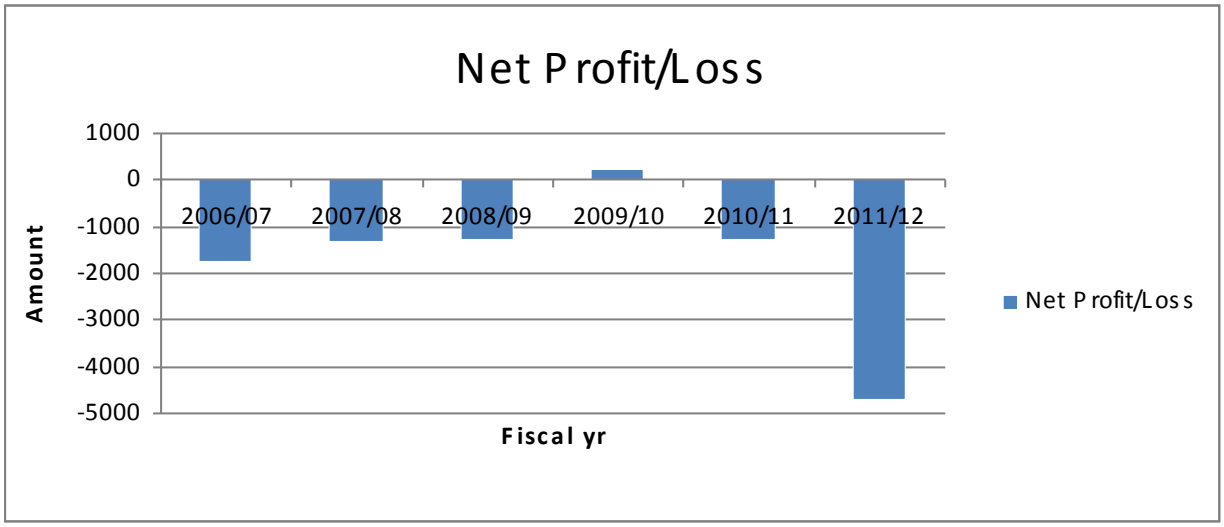
NRs. In million

Fiscal year	Profit/loss
2006/07	-1760.3
2007/08	-1312.8
2008/09	-1267.8
2009/10	240.78
2010/11	-1254.77
20011/12	-4681.24

Source: Table 3

From above table we can say that in 2006/07 NEA had loss of Rs. 1760.1 million which was reduced to Rs.1312.8 million in 2007/08 and was again reduced to Rs.1267.8 million in 2008/09. In 2009/10 NEA was able to get profit of Rs.240.78 million but again in 20010/11. NEA suffered of loss of Rs.1254.77 million. Due to lack of strong managerial policy as well as tight collection policy, the loss amount increased to Rs.4681.24 million in 20011/12

It can be shown with the following diagram



+**Figure 5: Profit and loss of NEA**

The above diagram shows that NEA has suffered loss in each fiscal year except in 2007/08. It shows that NEA has poor management. Though it has monopoly in the market, it fails to collect its revenue. It is failing to collect its electricity charges from its customers from the beginning. NEA doesn't have tight collection policy. That is why it is forced to suffer from loss. However, NEA was able to minimize the loss.

The very important thing that year should mote is above profit/loss not only includes operating expenses but also includes non operating expenses. Operating expenses means the expenses that directly deal with cash such as expenses related to generation of electricity, power purchase, transmission, distribution expenses, administrative expenses etc. whereas non operating expenses is the expenses that doesn't directly deals with the cash, such as depreciation, profit/loss on foreign exchange, deferred revenue expenditure written off., loss on sale of fixed assets etc. since non-operating expenses are also treated while computing profit, it can be said that profit is not the correct base for the decision making about the firm's performance. After adjusting or adding back these non operating expenses and none operating gain, we observe different profit/loss which is shown in the below table:

Table 5

Adjustment Profit/loss

NRs. in million

Fiscal year	Adjustment Profit/Loss
2006/2007	304.9
2007/2008	354
2008/2009	762.2
2009/2010	1779.83
2010/2011	1188.45
2011/2012	-1469.6

Source: Table 3

From the above table it can be said that NEA has obtained profit each year. The profit after adjusting non operating expenses gain from 2004/05 to 2008/09 was Rs.304.9 million, Rs.354 million, Rs.762.2 million, Rs.1779.83 million and Rs.1188.45 million respectively. Here, profit after adding back non operating expenses and deducting non operating gain was in increasing trend. Thus it can be said that NEA is able to provide its services well.

The following trend line clearly shows its actual operating profit:

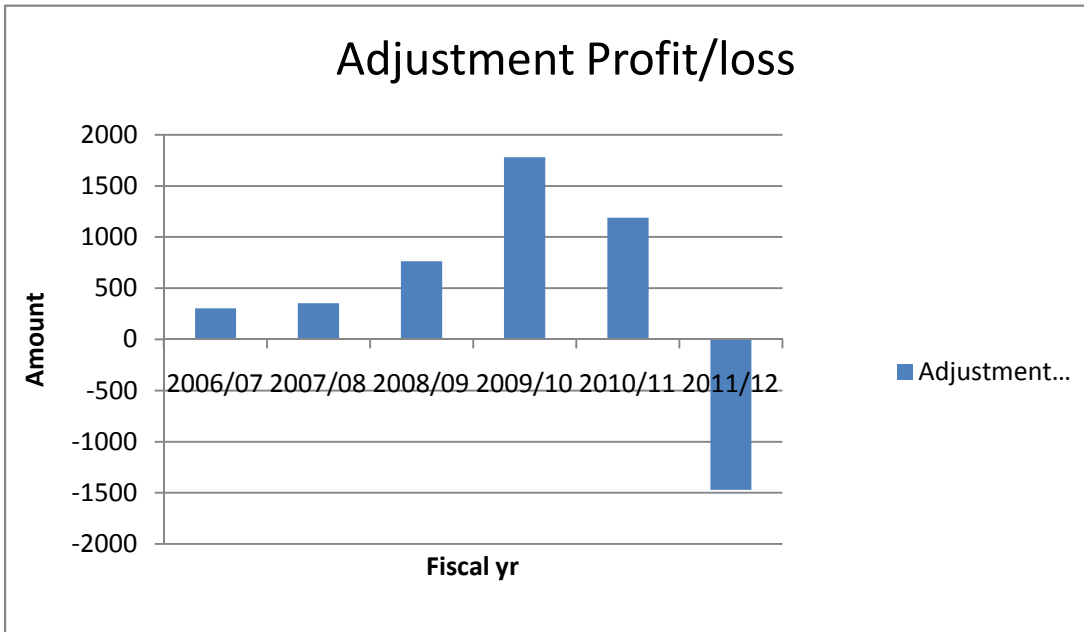


Figure 6: Adjustment Profit/loss

Above diagram indicates that NEA has increasing trend of actual operating profit till 2009/10 then it slightly decreases in 2010/11 and went negatively in 2011/12 and it is because the distribution cost and administrative cost increased and other income decreased in that year.

4.8 Comparison of Profit/loss computed from Income statement and the profit/loss computed after adjustment of non operating gain/expenses

We have already discussed above about the non operating gain and expenses. Profit derived from income statement is after deducting non operating expenses and adding non operating gain. Thus, here we are trying to compare the profit/loss that is obtained after deducting non operating expenses (profit/loss from income statement) and before deducting non operating expenses and trying to analyze whether these expenses affects our decision or not.The below table shows both the Profit and loss.

Table 6

Comparison of Profit/loss

NRs. in million

Fiscal year	Profit/loss	Adjustment profit/loss
2006/07	-1760.3	304.9
2007/08	-1312.8	354
2008/09	-1267.8	762.2
2009/10	240.78	1779.83
2010/11	-1254.77	1188.45
2011/12	-4681.24	-1469.6

Source: Table 3

From above table it is obtained that there is significant difference in the profit derived after deducting non operating expenses and before deducting non operating expenses. It is observed that from the income statement, NEA suffered loss but actually NEA has been gaining operating profit from the beginning of its operation.

This below diagram clearly shows the difference between the two profit/loss:

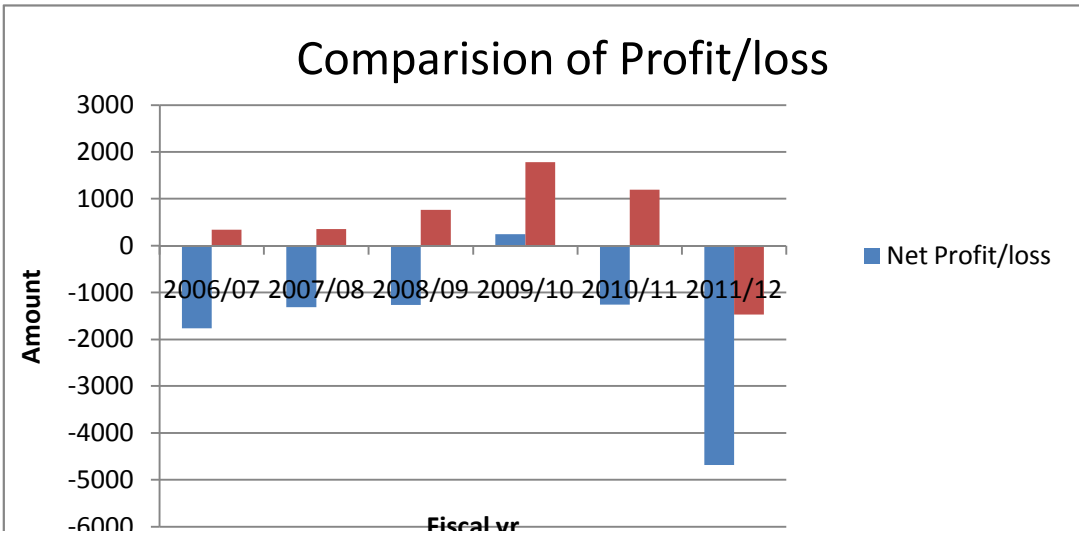


Figure 7: Comparison of Profit/loss

From the above diagram, we can say that NEA was actually able to obtain operating profit. Thus, the decision we have made earlier by analyzing profit /loss from income statement i.e. profit/loss computed after non-operating expenses was wrong. Actually, NEA has been succeeding to achieve its profit. NEA was in loss due to inclusion of depreciation, provision for loss, deferred revenue expenditure and loss on foreign exchange. Since these expenses are none operating and non cash expenses, it is not true to say that NEA was in loss and was not able to operate its services. But in fact, NEA has been running successfully. After adjusting none operating none operating and non cash expenses which we can also find in cash flow statement as funds from operation, the enterprise earned operating profit of Es.304.9 million in 2006/07 but income statement showed the loss of Rs.1760.3 million. It is because while preparing income statement there was deduction of depreciation of Rs.1686 million, loss in foreign exchange of Rs.59.1 million and deferred revenue expenditure written off Rs.320.1 million. When we add back all these non operating expenses, we get profit of Rs. 59.1 million as shown by above table. Similarly, cash flow statement showed operating profit of Rs. 354 million, Rs.762.2 million, Rs.1779.83 million and Rs. 1188.45 million from 2007/08 to 20010/11 where income statement showed the loss figures except in 2011/12 where there was profit of Rs. 314.19 million which was very less than actual operating profit. In 2011/12, due to increase in cost of sales and a very lack of power generation than actually required because of poor management, the company suffers operating loss of Rs.1469.6 million for the first time. However, this loss was far less than the loss showed by the income statement which was Rs.4681.24 million.

Thus, from above interpretation and analysis of the data it can say that none operating and none cash expenses very much affect in the decision making. These expenses give negative information about the firm. That is why, one should not base their decision only on net profit/loss computed from income statement, and they also should analyze the operating profit derived from cash flow statement. In fact, operating profit obtained through cash flow statement is the most genuine figure to take for the important decision to make.

4.9 Analysis of Cash/Bank balance

Cash is the most important current asset for the operation of a business. None of the company or an enterprise can operate without each. It is the cash from which all transaction is done. Manufacturing or trading of any products or services is held through cash. Thus cash is the most important component of the organization. However, company should keep only sufficient cash. More cash balance reduces rate of return on equity and less cash balance reduces investment opportunities. That is why company should be very careful while holding cash.

The following table shows the cash/bank balance of NEA during the study period:

Table 7

Cash and Bank balance

NRs. In million

Fiscal year	Opening Cash/ Bank balance	Closing Cash/ Bank balance	Increase/ Decrease(%)
2006/07	1076.15	1036.42	-3.69
2007/08	1036.42	1322.6	27.61
2008/09	1322.6	1258.6	-4.84
2009/10	1258.6	1447.58	15.02
2010/11	1447.58	820.84	-43.3
2011/12	820.84	697.11	-15.07

Source: Table 3

The above table shows the cash/bank balance of NEA was fluctuation. The above table shows that opening cash/bank balance was Rs. 1076.15, Rs.1036.42, Rs.1322.6, Rs.1258.6, Rs.1447.58 and Rs.820.84 million and closing cash/bank balance was Rs.1036.42, Rs.1322.6, Rs.1258.6, Rs.1447.58, Rs.820.84 and Rs.697.11 million from 2006/07 to 2011/12 respectively. Cash balance was increasing and decreasing trend subsequently which can be shown with the following diagram.

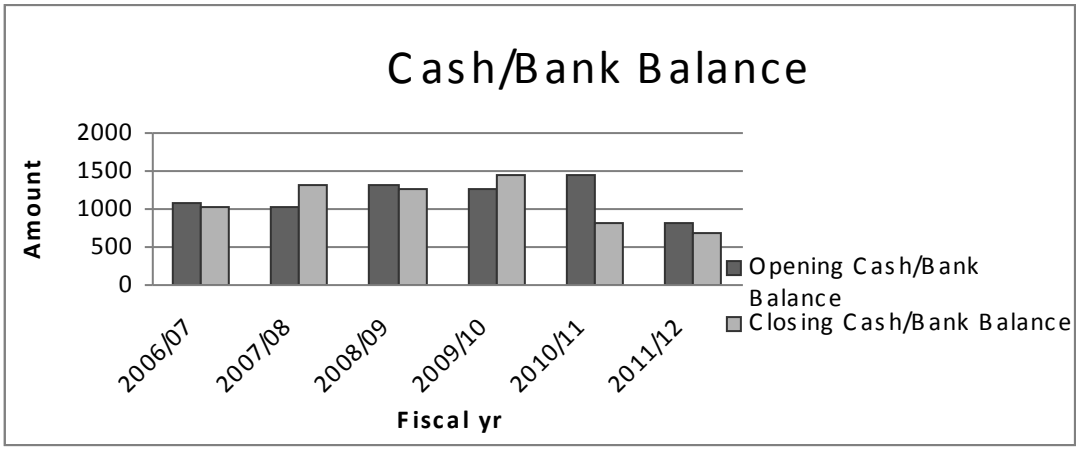


Figure 8: Cash and Bank balance

Closing cash balance was derived by adding operating cash balance to the net cash increase/decrease i.e. cash generation (CFOA+CFIA+CFFA). If net cash increases i.e. if there is positive cash generation. Closing cash balance will be greater than opening cash balance and vice-versa. In 2006/07, closing cash balance was lower than opening balance. It decreased by 3.69% than previous year. it is because, from cash flow statement we found that in that year net cash flow was in negative figure due to huge investment of cash as well as purchase of plant & machinery that is operated from operating activities and financing activities. Therefore we can say that it was good move by the NEA. In 2007/08, closing cash balance was increased by 27.61%. It means there was positive cash generation and it was due to more cash inflow from operation activities but again in 2008/09 there was negative cash generation and closing cash balance decreased by 4.845%. In 2009/10, it increased by 15.02% and again in 2010/11 it decreased by 43.3%. In 2011/12, it decreased by 15.07% because of more purchase of plant & machinery and investment.

From the above information and the analyzation, we simply can say that NEA is holding cash inconsistently and utilizing it not properly. There was very fluctuation in handling the cash which might not be in the favor of an enterprise.

4.10 Analysis of Cash Flow Ratios as an Accounting Tool

As an accounting tool, various cash flow ratios have been used for the analysis of the data. Cash flow ratios are generally generated from cash from operation since cash generated from operating activities excludes non cash and non operating expenses and gives true figure to analyze the data. The cash flow ratios used in this study are:

4.10.1 Cash Flow Sufficiency Ratio

Cash flow sufficiency ratios are aimed at assessing a company's relative ability to generate sufficient cash to meet its cash flow needs. All ratios indicate whether a company's cash flows are sufficient for the payment of debt, acquisitions of assets and payment of dividends. These ratios are:

Cash Flow Adequacy Ratio

Cash flow adequacy ratio measures the cash from operating activities with respect ot the repayment of borrowing and assets required. In the present study, the ratio is calculated and analyzed to measure the entity's ability to produce sufficient operating cash flows to cover its main cash requirement, specifically, the payment of debt, the acquisition of assets, and the payment of dividends. It is calculated using the following formula:

Cash Flow Adequacy Ratio =

$$\frac{Cash\,Flow\,from\,Operations}{\text{Re}\,payment\,of\,borrowings + Assets\,acquired + Dividends\,paid}$$

Table 8

Cash Flow Adequacy Ratio

NRs. In million

Fiscal year	CFOA	Repayment of borrowing	Assets acquired	Dividend paid	Ratio
2006/07	2335.16	1695.44	1320.39	0	0.77
2007/08	2944.07	1781.95	751.42	0	1.16
2008/09	2570.2	1985.08	0	0	1.29
2009/10	3615.75	569.87	38.38	0	5.94
2010/11	2991.93	2779.62	512.34	0	0.90
2011/12	2043.33	2254.76	26384.79	0	0.07

Source: Table 3

In the above table, assets acquired refer to the assets purchased. Dividend payment is nil because NEA doesn't pay dividend to anybody. It was owned by the government and that is why all the shares are of the government. Thus, government instead of

taking dividend, it enjoys profit. From above table, cash flow adequacy is increasing in the first four years and decreasing in the last two years during the study period. It indicates that NEA has obtained sound cash inflow from operating activities and it is able to repay its debt and able to purchase needed assets except in 2006/07, 20010/011and 2011/12. In 2006/07, cash flow adequacy ratio was 0.77 which was below the requirement. The requirement level of the ratio should be above 1. Since, the ratio fallen below 1i.e 0.77, it indicates that in that year NEA has to borrow from outsiders to repay its old borrowing and to acquire assets. Then in the subsequent years. NEA was able to maintain its cash flow adequacy ratio above 1 for three years. however, NEA couldn't maintain its increasing trend of cash flow ratio and it falls to 0.07 in 2010/11ot is because in that year, an enterprise bear a huge loss as well as there was increase in assets with a large amount which made ratio to fall at 0.07 from 0.90.The following trend line shows the ratio of cash flow adequacy:

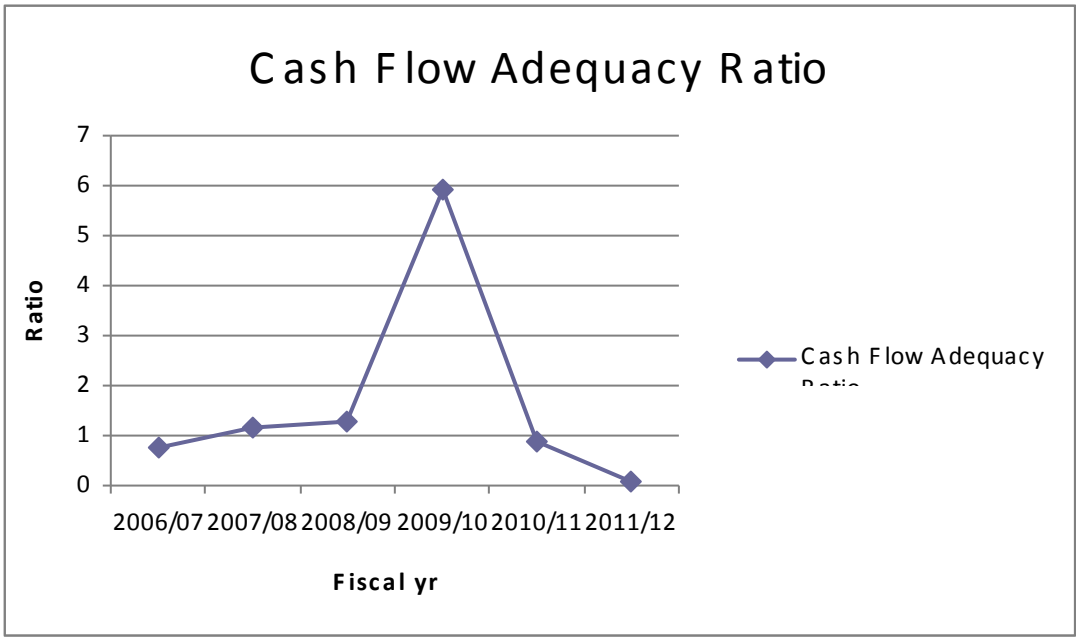


Figure 9: Cash Flow Adequacy Ratio

From above trend line, it can be clearly defined that cash flow ratio was below one in the first year of the study. Then it starts to increase till 2009/10 having the ratio above one and finally in the last two years it again downfalls to below one. From this interpretation we can say that an enterprise was able to generate cash inflow to repay the borrowings and to acquire assets to some extent but it was not satisfactory since there was up and down in maintaining the ratio.

i. Debt Coverage Ratio

The debt coverage ratio shows the ability of a company to generate cash flow from operating activities to pay its total debt commitment. Total debt includes long-term debt and short-term debt. Short term debt usually means current liabilities which involves sundry creditors, account payable etc.

$$\text{Debt Coverage Ratio} = \frac{Total\ Debt}{Cash\ Flow\ from\ Operations}$$

Table 9

Debt Coverage Ratio

NRs. in million

Fiscal year	Total Debt	Cash flow from operations	Ratio
2006/07	54959.75	2335.16	23.54
2007/08	61306.2	2944.07	20.82
2008/09	65632.3	2570.2	25.54
2009/10	69735.15	3615.75	19.29
2010/11	78379.89	2991.93	26.19
2011/12	85817.23	2043.33	41.99

Source: Table 3

From the above table it is found that debt coverage ratio is decreasing in the second year and increasing in the third year but decreased in fourth yesr and again increased in the fifth year. it indicates that NEA has fluctuation debt coverage ratio in relation to the cash from operations. It also indicates that NEA is not able to generate adequate amount of cash from operating activities to pay its total debt but to some extent it is being able to improve its cash position.

Since debt coverage ratio is computed dividing total debt by cash from operation. It is better to have the ratio below one. But above table indicates the ratio of debt coverage was above one which explains NEA has to do lots of things to increase its cash inflows. NEA is far way back to pay its total debt. It is very much dependent on

foreign loans to pay its local debt and that is why its long-term loan has been increasing.

The below diagram clearly defines the proportion of cash from operation and the total debt:

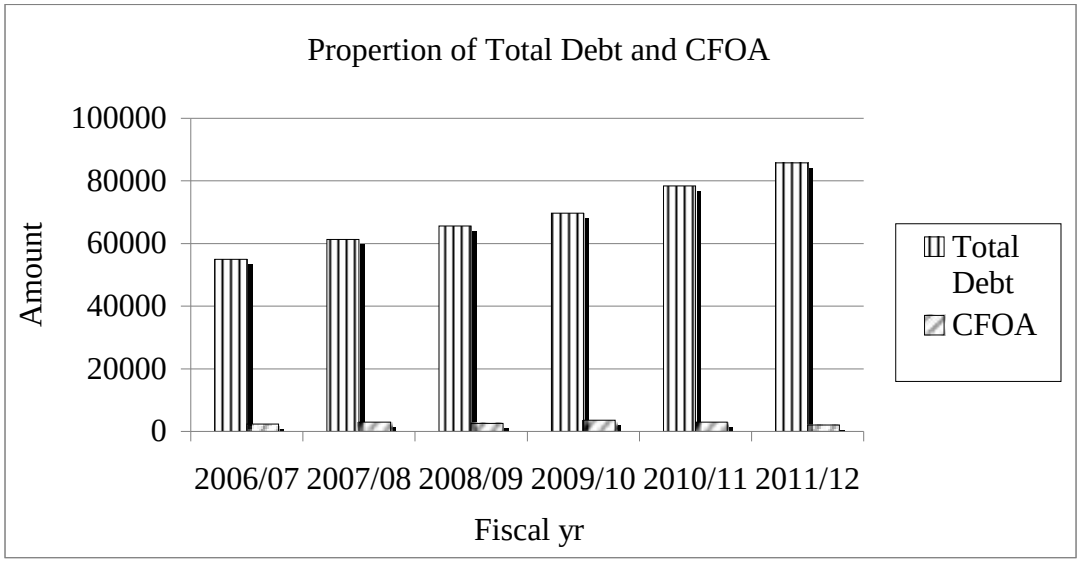


Figure 10: Proportion of Total Debt and CFOA

In the above diagram, the dark shadowed represent total debt and white shadowed represent cash from operation. Above diagram clearly shows that the amount of total debt is very much higher than the cash from operation. The below trend line represents the ratio between total debt and cash from operation:

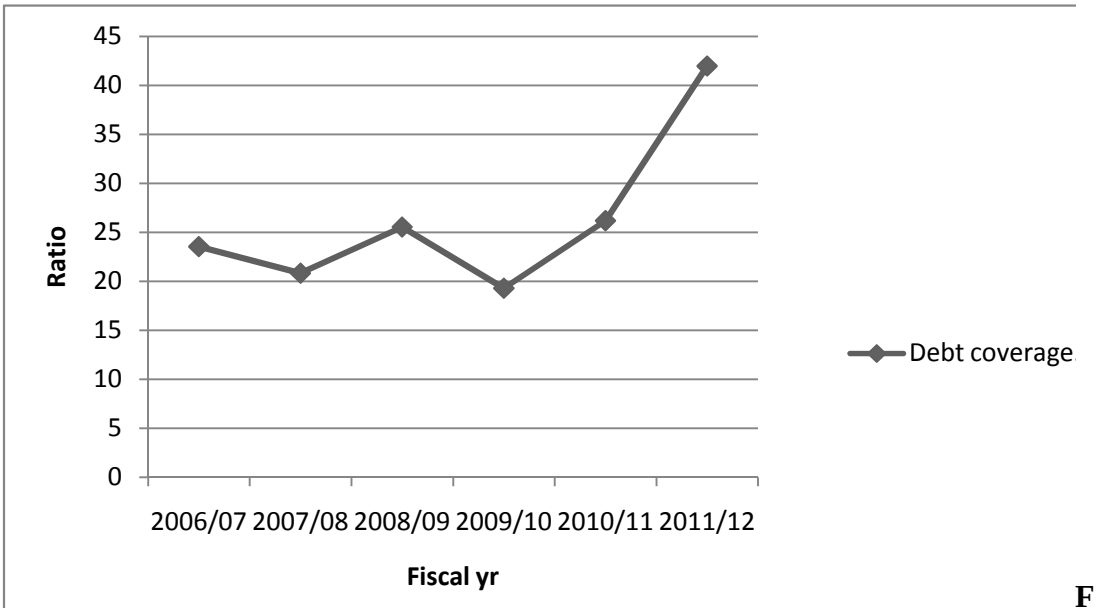


Figure 11: Debt coverage Ratio

The above trend line obliviously shows the fluctuation in the debt coverage ratio and which was below than the requirement. It is better for the enterprise to have debt coverage ratio below than one. It the enterprise could maintain the ratio below one, it signifies the enterprise has the ability to pay its all the debt through cash from operation. But unfortunately, debt coverage ratio the NEA maintained was above one which indicates NEA was not able to generate needs cash flow from operation to pay the debts. Furthermore the trend line shows NEA couldn't maintain consistent debt coverage ratio. It was in the increasing and decreasing trend which signifies NEA's performance is not well deserved and has to improve a lot.

ii Repayment of Borrowing Ratio

This ratio indicates the ability of a firm to repay its borrowing out of long-term debt. In other words, the ratio is calculated for the purpose of covering long-term debt commitments in the current year.

$$\text{Repayment of Borrowing Ratio} = \frac{\text{Re}\,paymentof\ Borrowings}{Long\,ZTermDebt}$$

The following table shows the repayment of borrowing ratio:

Table 10

Repayment of Borrowing Ratio

NRs. in million

Fiscal year	Repayment of borrowing	Long-term debt	Ratio (%)
2006/07	1695.44	41103.14	4.12
2007/08	1781.95	44537.51	4
2008/09	1985.08	46487.91	4.27
2009/10	569.87	47616.15	1.2
2010/11	2779.62	52762.18	5.27
2011/12	2254.76	58217.77	3.87

Source: Table 3

Higher the ratio higher will be the repayment of borrowing and vice-versa. Above table shows the repayment of borrowing ratio or NEA was 4.12%, 4%, 4.27%, 1.2%, 5.27% and 3.87% from 2006/07 to 2011/12 respectively. The above ratio indicates NEA has been paying very little amount of debt out of its total amount of long-term debt. It signifiers long-term debt of NEA is increasing every year which is not good for the enterprise. To show healthy position, NEA should minimize its long- term debt by paying it. Holding these long-term debt increases more cost to the enterprise because more you delayed to repay the loan more you have to pay the interest amount and which ultimately decreases net profit as well as cash inflow.

It can be presented by the diagram as follow:

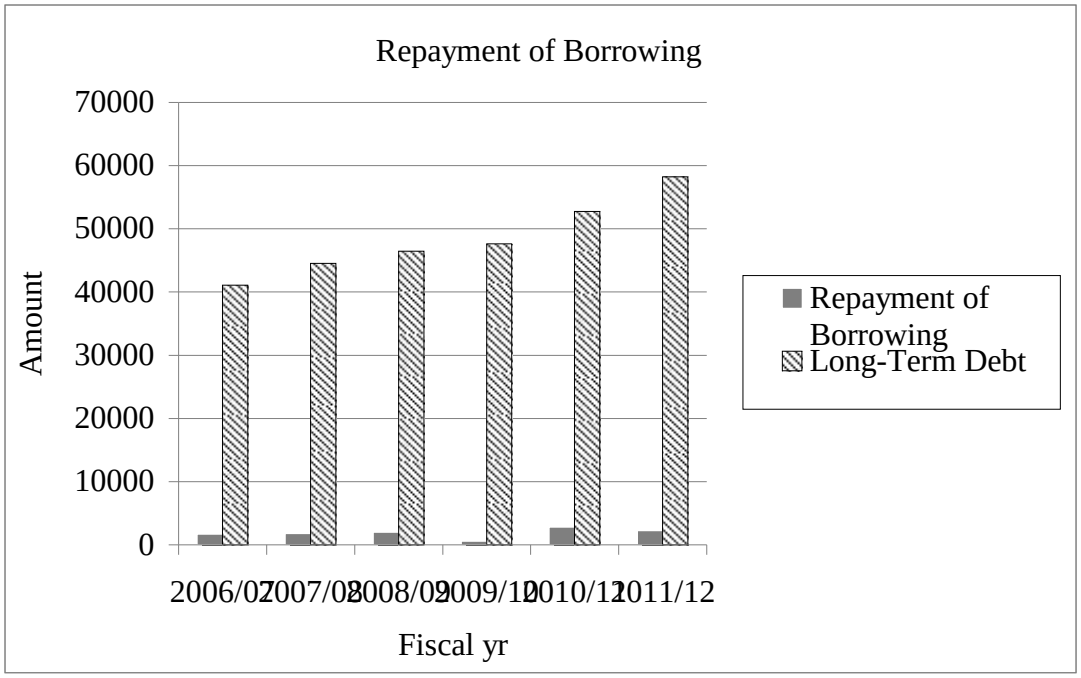


Figure 12: Repayment of Borrowing Ratio

From the above diagram, we can say that there was very less contribution by the repayment in paying the debt. Borrowing was taken by the NEA in huge value and there was not much of repayment, which shows NEA is not able to generate enough cash from operating activities so that according to above calculation it is better to pay its debt.

iii. Reinvestment Ratio

The reinvestment ratio presents the ability of a company to generate cash from operating activities for the purpose of covering asset acquisition payments.

$$\text{Reinvestment Ratio} = \frac{Payment\ for\ \text{Property, Plant and Equipment}}{Cash\ Flow\ from\ Operations}$$

Table 11

Reinvestment Ratio

NRs. in million

Fiscal year	Purchase of Property, Plant & Equipment	Cash Flow from Operation	Ratio (%)
2006/07	1320.39	2335.16	0.57
2007/08	751.42	2944.07	0.26
2008/09	0	2570.2	0
2009/10	38.38	3615.75	0.01
2010/11	512.34	2991.93	0.17
2011/12	26384.79	2043.33	12.91

Source: Table 3

The main purpose of computing this ratio is to figure out how much money the NEA has spent in purchasing or investing in property, plant and equipment. Higher ratio signifies higher purchase of property, plant and equipment and vice-versa. From above table, we can say that in 2006/07, more than 50% of cash was spent on purchase of fixed assets. In that year the ratio was 0.57 i.e. 0.57%. In the subsequent years. NEA slows down its purchasing capability. In 2008/09, NEA didn't purchase any fixed assets and that is why the ratio was zero. Moreover, in that year, NEA sells its assets for Rs.423.18 million. However, in the following years the reinvestment ratio increases from 0.01 to 0.17 which indicates NEA has invested some of its cash to acquire plant and equipment. In 2011

±6-./12, the ratio was 12.91 i.e. NEA has purchase plant and equipment more than its CFOA which indicates it has borrowed huge amount to invest on it. It signifies NEA is expanding its operation. It can be concluded that Purchase of property, Plant & Equipment in 2009/10 is 26384.79 (NRs in million) and its Reinvestment Ratio is 12.91%.

Reinvestment ratio can be shown by the following trend line:

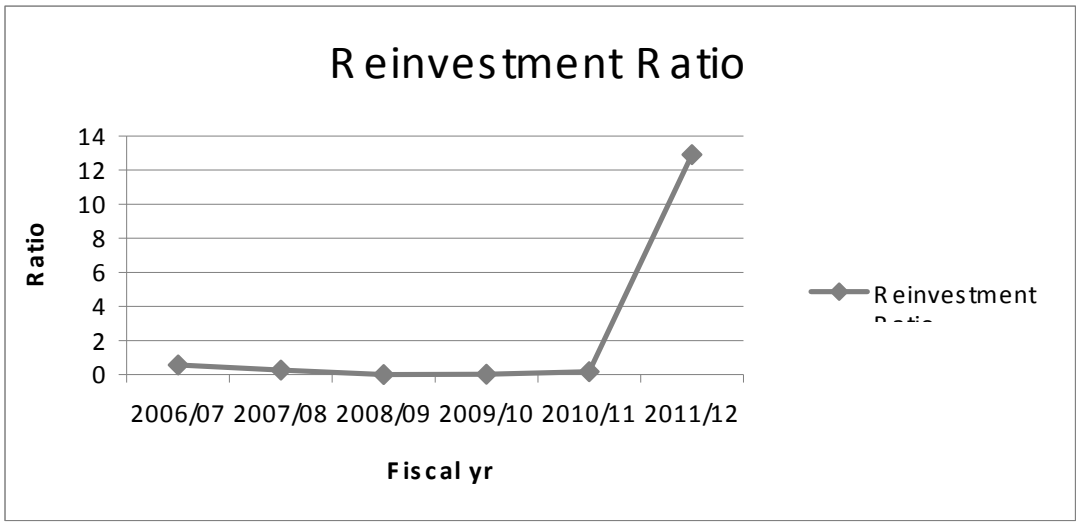


Figure 13: Reinvestment Ratio

The above trend line shows the reinvestment ratio decreases heavily from the second year till 2009/10 during our study period, which refers investment done in purchasing plant and equipment is decreasing. Thus, NEA has to invest more and purchase more advanced plant and equipment to expand its operation and that has been somewhat achieved in 2011/12 but still it is not sufficient to reduce the problem of load shedding we people are facing these days. Thus, NEA needs to invest more on purchasing plant and equipment to expand or build new hydro powers.

4.10.2 Cash Flow Return Ratio

This group is sometimes called efficiency ratios. It shows the ability of a company to generate operating cash flows. Cash flow efficiency ratios are used to assess the relationship between items in the income statement and balance sheet with cash flow from operations as disclosed in the cash flow statement. These ratios are as follows.

i. Cash Flow to Revenue Ratio

This ratio is aimed at showing the ability of the company to turn revenue into cash. The higher the ratio, the better the ability, this ratio employs information provided by the statement of cash flow and the income statement. It is computed by dividing cash from operating activities by revenues.

$$\text{Cash Flow to Revenues} = \frac{Cash\,Flow\,From\,Operations}{\text{Re}venues}$$

Table 12

Cash flow to Revenue Ratio

NRs. in million

Fiscal year	Cash Flow from Operation	Revenues	Ratio
2006/07	2335.16	11874.7	0.20
2007/08	2944.07	12605.2	0.23
2008/09	2570.2	13331.9	0.19
2009/10	3615.75	14449.73	0.25
2010/11	2991.93	15405.03	0.19
2011/12	2043.33	15220.87	0.13

Source: Table 3

Revenue refers to the total cash generation from sale of electricity and cash from operation refers to the net cash generation from operating activities. Under direct method. Cash from operating activities is computed from revenue. When purchase and payments to the creditors, cash operating expenses, interest expenses, tax expenses are deducted from sales revenue and adjusted marketable securities and bank overdraft in the result amount, we obtain cash from operation which we have already discussed in the literature of review with a table format. Cash from operation also can be called as operating profit. Thus, it is important to know how much cash from operation generated out of total revenue excludes all the expenses.

The below trend line shows the cash flow on revenue ratio:

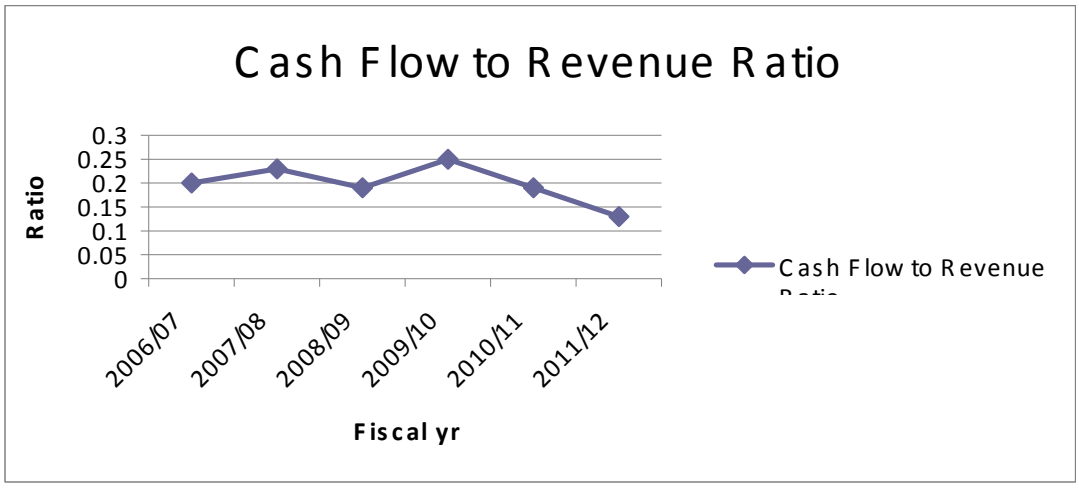


Figure 14: Cash flow to Revenue Ratio

From the above table and trend line, we can say that less than 0.5 i.e cash was generated from revenue. In 2006/07 the ratio was 0.2 which indicates only 20% cash was generated out of 100% which shows the NEA's weak ability to turn revenue into cash, in 2007/08, 23% cash was generated which is 3% more than that of previous year but still not satisfactory performance. The ratio falls to 19% in 2009/10 which indicated NEA is not improving in its performance. The ratio however increases to 25% in 2009/10 showing some positive sign but again it decreases to 19% in 2010/11and again it decreases to 13% in 2011/12.

Thus, NEA is not fully able to convert its revenue to cash. Moreover, it is not consistent in generating cash from revenue which can be seen in the above trend line. the line moves upward and downward in each yr which signifies the fluctuation in the generation cash from revenue.

Statistical Tool:

Correlation: Correlation analysis refers to the statistical technique, which measures the degree of relationship between two or more variables. It is to be noted that a high degree of correlation between two variables doesn't always necessarily imply that changes in one variation cause changes in the other. Out of several methods of calculating correlation, Karl Pearson's coefficient of correlation is one of the best methods and it is denoted by 'r'. Its value always lies between -1 and 1. The general rules for interpreting the value of 'r 'are:

I. When r = 1, there is positively perfect correlation between the two variables.

II. When r = -1, there is negatively perfect correlation between the two variables.

III. When r = 0, the variables are uncorrelated.

IV. Nearer the value of r to 1, closer will be the relationship between two variables and nearer the value of r to 0, lesser will be the relationship.

The relation between sales revenue and cash from operating activities (CFOA) also can be shown by using some statistical tools. Here, we are using correlation between sales revenue and CFOA.

Since CFOA is directly dependent on revenue, revenue is considered as independent variable and CFOA as dependent variable.

Table 13

Correlation between Sales Revenue and CFOA

NRs. in million

Sales (X)	CFOA(Y)	X = (X-13331.9)	xy	X^2	Y^2
11874.7	2335.16	-1457.2	-3402795.152	2123431.84	5452972.226
12605.2	2944.07	-726.7	-2139455.669	528092.89	8667548.165
13331.9	2570.2	0	0	0	6605928.04
14449.73	2615.75	1117.83	1041793.823	124954.909	13073648.06
15405.03	2991.93	2073.13	6202659.841	4297867.997	8951645.125
15220.87	2043.33	1888.97	3859789.07	2568207.661	4175197.489
X = 82887.43	|ϕy=16500.44	ϕx= 2896.03	ϕxy= 8561991.973	ϕx^2= 11767144.3	ϕy^2= 46926936.11

Source: Table 3, Appendix IV and V

$$r = \frac{n \sum xy - \sum x \sum y}{\sqrt{n \sum x^2 - (\sum x)^2}\sqrt{n \sum y^2 - (\sum y)^2}}$$

$$= \frac{6*8561991.913 - 2896.03*16500.44}{\sqrt{6*11767144.3 - (2896.03)^2}\sqrt{6*49626939.11 - (16500.44)^2}}$$

$$= \frac{3586182.225}{7887.740*3049.117}$$

$$= 0.14$$

Since the value of r is 0.14, it can say that there is positive but lesser relationship between the two variables: sales revenue and CFOA. It signifies, if sales revenue increases, CFOA also increases and vice-versa.

Here, we can use probable error (P.E.) of the correlation coefficient to test the reliability of correlation (r). It is the measure of testing the reliability of the calculated value of r. It is basically used to interpret whether calculated value of r is significant or not. It can be interpreted as:

i. If r > P.E., it is significant.

ii. If r < P.E., it is insignificant. Thus, perhaps there is no evidence of correlation.

Now,

The P.E of above value of r is

$$P.E = 0.6745 \frac{1 - r^2}{\sqrt{n}}$$

$$= 0.6745 * \frac{1 - (0.14)^2}{\sqrt{6}}$$

$$= 0.27$$

Again,

$$6\ P.E = 6*0.27$$

$$= 1.62$$

Since r < 6 P.E. i.e 0.14 < 1.62, we can say that the ascertained value of correlation coefficient, r is insignificant. It means, there is perhaps no evidence of correlation.

ii. Cash Flow to net Income Ratio

Cash flow to net income ratio compares the company's profit with cash flow from operations and attempts to provide an index of the cash-generating productivity of operations. The main purpose to calculate this ratio is to find out whether the ratio is capable enough to carry out certain decisions.

Net income and cash from operation fare two different elements. Net income is computed preparing income statement where as cash from operation is derived from cash flow statement. When cost of goods sold, selling and administration expenses and all the non operating and non cash expenses are deducted from sales revenue, we get net income/profit. Cash from operation excludes all the non operation and non cash expenses and includes working capital. In order words, when non operating expenses are added back and non operating income are deducted from net profit. We obtain funds from operation (FFO) and when we add decrease in working capital except cash and deduct increase in working capital except cash we ascertain cash from operating activities which we have already discussed in review of literature. This is calculated as cash flows from operations divided by profit after income tax.

$$\text{Cash Flow to Net Income Ratio} = \frac{Cash\ Flow\ from\ Operations}{Net\ \Pr ofit}$$

Table 14

Cash Flow to Net Income Ratio

NRs. in million

Fiscal year	Cash Flow from Operation	Net Profit	Ratio
2006/07	2335.16	-1760.3	-1.33
2007/08	2944.07	-1312.8	-2.24
2008/09	2570.2	-1267.8	-2.03
2009/10	3615.75	240.78	11.51
2010/11	2991.93	-1254.77	-2.28
2010/12	2043.33	-4681.24	-0.44

Source: Table 3

In the above table, it is found that the ratio was in negative in the first three years and in the last two years of the study since net profit was in negative figure i.e there was loss. However, cash flow from operation was positive in all years. It signifies that though the enterprise is bearing loss, it can generate positive cash inflow. It also signifies that non operating expenses very much affects net profit in addition to it., net profit is not the only sourced of cash inflow , cash inflow also can be can be obtained from working capital. That is why cash from operating activities is a strong tool than net profit for decision making. When cash is received from the debtors or creditor, it is cash inflow for the firm. Since such activity do not affect in computation of net profit. We shouldn't base our decision only on net profit of the firm, it also have to analyze the CFOA.

The ratio can be shown with the following diagram:

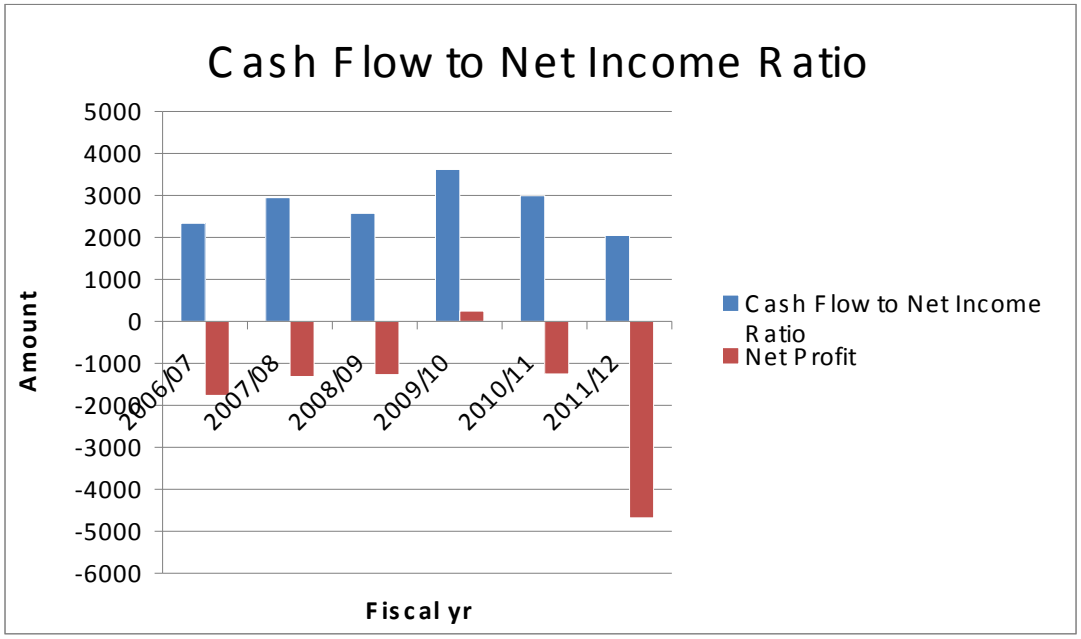


Figure 15: Cash Flow to Net Income Ratio

The above diagram clearly shows that cash was generated by NEA even it bewared loss in subsequent years.

Statistical Tool:

The relation between net profit and CFOA can be ascertained by using correlation which is as follows:

Table 15

Correlation between Net Profit and CFOA

NRs. in million

Net Profit (X)	CFOA (y)	X = x-(-1267)	Xy	X^2	Y^2
-1760.3	2335.16	-492.5	-1150066.3	242556.25	5452972.226
-1312.8	2944.07	-45	-132483.15	2025	8667548.165
-1267.8	2570.2	0	0	0	6605926.04
240.78	3615.75	1508.58	5454648.135	2275813.616	13073648.06
-1254.77	2991.93	13.03	38984.85	169.78	8951645.125
-4681.24	2043.33	-3413.44	-6974784.355	11651572.63	4175197.489
$\phi y = 16500.44$		$\phi x = -2429.33$	$\phi xy = -2763700.82$	$\phi x^2 = 14172137.28$	$\phi y^2 = 46926939.11$

Source: Table 3

$$r = \frac{n \quad xy\,Z \quad x \quad y}{\sqrt{n \quad x^2\,Zf \quad xÅ\sqrt{n \quad y^2\,Zf \quad yÅ}}}$$

$$= \frac{6 * 2763700.82\,Z(Z2429.33) * 16500.44}{\sqrt{6 * 14172137.28\,Z(Z2429.33)^2}\,\sqrt{6 * 46926939.11\,Z(16500.44)^2}}$$

$$= \frac{23502808.99}{8895.57 * 3049.12}$$

$$= 0.87$$

Since the value of r is 0.87, we can say that there is highly positive correlation between two variables.

Again,

$$P.E. = 0.6745\ \frac{1Zr^2}{\sqrt{n}}$$

$$= 0.6745 * \frac{1Z(0.87)^2}{\sqrt{6}}$$

$$= 0.07$$

Now,

6 P.E = 6* 0.07

= 0.40

Since r > 6 P.E i.e., 0.87 > 0.40. We can say that the ascertained value of correlation coefficient r is significant. It means, when if profit increases CFOA also increases and vice- versa.

iii. Cash Flow Return on Assets Ratio

This ratio attempts to measure the company's return on assets in term of the cash flow generated from operations. It evaluates how much cash has been generated before deducting interest expenses and income tax expenses from using certain amount of total assets which can be converted into cash within a year such as sundry debtors, a/c receivable. Inventories, cash and bank balance etc and fixed assets is long term assets such as plant and machinery, furniture and fixtures, investments etc. the formula for computing cash flow return on assets ratio is:

Cash flow Return on Assets =

$$\frac{Cash\ flow\ from operations \Gamma income tax\ paid\ \Gamma \text{int} erest rate}{Total\ Assets}$$

Table 16

Cash flow return on Assets

NRs. in million

Fiscal year	Cash flow from operation	Income tax paid	Interest paid	Total Assets	Ratio
2006/07	2335.16	-	2991.5	70631.11	0.085
2007/08	2944.07	-	3079.8	77495.56	0.078
2008/09	2570.2	-	3050.9	83550.08	0.067
2009/10	3615.75	-	2385.41	92131.97	0.065
2010/11	2991.93	-	2368.41	101218.35	0.053
2011/12	2043.33	-	2809.46	108790.01	0.045

Source: Table 3

From above table is it is observed that cash flow return on assets ratio was 0.085, 0.078, 0.067, 0.065, 0.053 and 0.045 from fiscal year 2006/07 to 2010/11respectively. Higher ratio implies higher cash generation from the utilization of total assets. Thus, we can say that highest cash was generated in 2006/07, since the ratio obtained was higher than the rest. Then it gradually starts to fall down which shows NEA's inability to utilize its assets properly. It can be presented with the following trend line.

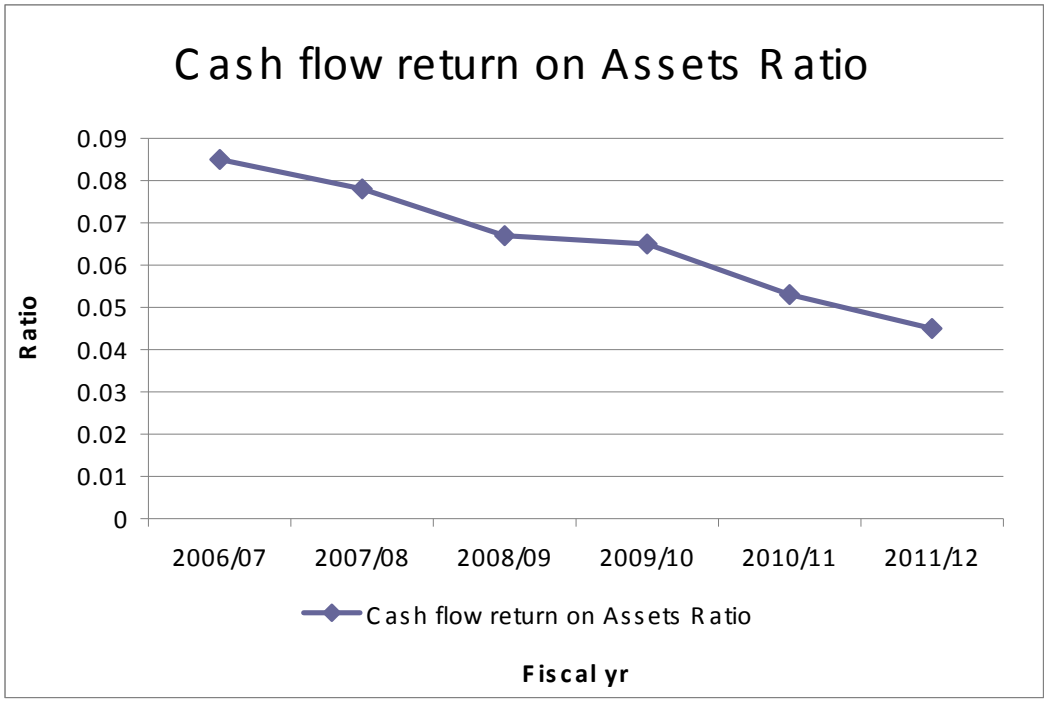


Figure 16: Cash Flow Return on Assets Ratio

From the above trend line we can say that the ratio moves in decreasing trend. It significant, NEA was unable to use its resources to the fullest. A higher ratio usually indicated efficiency in the utilization of its available resources and vice-versa. From above derivation, we found that NEA has failed consistently to generate cash from its resources. It also tells that NEA has a poor management and strategies policy.

iv. Cash flow Return on Stockholder's equity ratio

This ratio shows the ability of the company to generate a sufficient cash return for stockholders. The ratio evaluated the amount of cash generation by utilizing stockholder's equity. It helps to ascertain the amount that it has to repay to its stockholders. Since there was only Nepal government's share in NEA and it is totally controlled by the government, profit is taken as a part or return.

Cash flow Return on Stockholder's equity Ratio = $\frac{Cash\ flow\ from operations}{Average Stockholder's\ Equity}$

Table 17

Cash flow Return on Stockholders' Equity Ratio

NRs. in million

Fiscal year	Cash flow from operation	Stockholders' Equity	Ratio
2006/07	2335.16	15218.16	0.15
2007/08	2944.07	15867.66	0.19
2008/09	2570.2	17567.78	0.15
2009/10	3615.75	21579.46	0.17
2010/11	2991.93	22300.11	0.13
2011/12	2043.33	21368.65	0.10

Source: Table 3

From above table it is observed that cash flow return n stockholders' equity was 0.15, 0.19, 0.15, 0.17, 0.13 and 0.10 from fiscal year 2006/07 to 2010/11 respectively. From this derivation, we can say that there was fluctuation in maintaining the ratio. NEA was not consistent in utilizing the available sources of fund so that it can repay to its shareholder. Since there was only government's share and it is totally owned by the government, government takes cash that generated by the NEA instead of dividend. Above table signifies, NEA is inefficient to generate required cash. It can be presented with the following trend line:

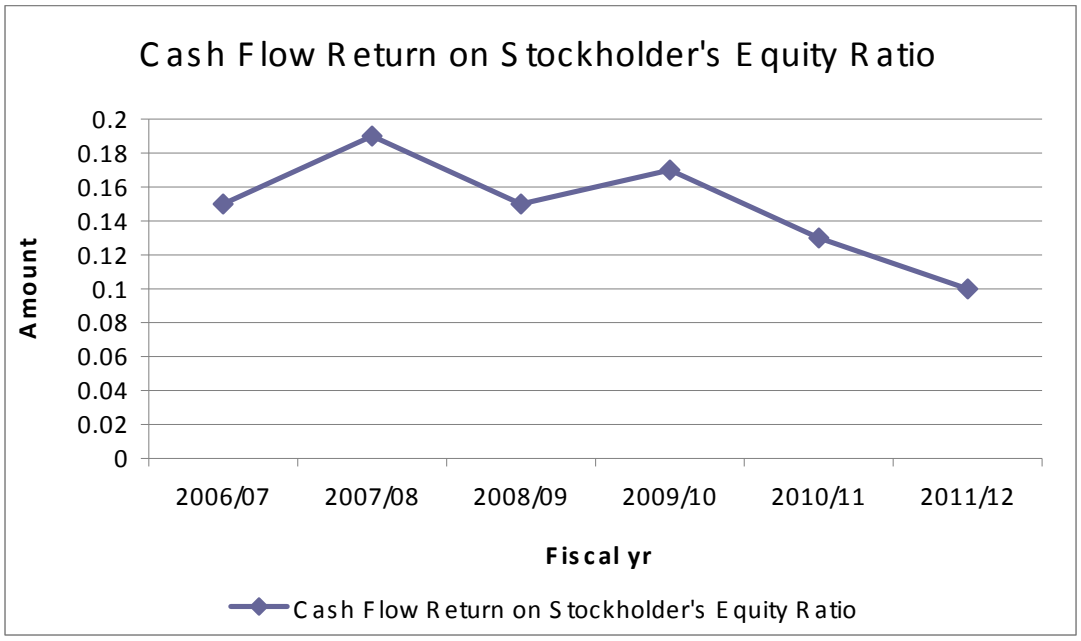


Figure 17: Cash Flow Return on Stockholder's Equity Ratio

The trend line of cash flow return on stockholders' equity shows the fluctuation in the ratio. That means NEA was not consistent in maintaining cash flow return on stockholders' equity as well.

4.10.3 Cash Inflow to Outflow Ratio

Cash turnover ratio basically analyze the relation between total cash inflow and total cash outflow from operating, investing and financing activities overall. Higher the ratio higher will be the cash inflow and vice-versa.

$$\text{Cash Inflow to Outflow Ratio} = \frac{\text{Total cash inflow}}{\text{Total cash outflow}}$$

Table 18

Cash Inflow to Outflow Ratio

NRs. in million

Fiscal year	Total Cash Inflow	Total Cash Outflow	Ratio
2006/07	3344.73	3384.46	0.98
2007/08	6542.44	6256.26	1.045
2008/09	5486.82	5550.82	0.99
2009/10	7443.2	7254.22	1.026
2010/11	7391.15	8017.89	0.92
2011/12	9102.84	9226.57	0.99

Source: Table 3

From the above table, it is observed that the ratio of cash inflow to outflow is 0.98, 1.045, 0.99, 1.026, 0.92 and 0.98 from 2006/07 to 2011/12 respectively. The ratio above one signifies cash inflow is greater than cash outflow but if the ratio is below one then there is cash outflow is more than inflow.

Here, cash inflow and outflow is taken from cash flow statement. Cash flow statement perfectly shows the sources and uses of the cash. From cash flow statement, we can say that from where cash is obtained and where it is being used. NEA has obtained cash inflow basically from operation activities and financing activities and cash was out flowed to investing activities. The reason behind obtaining cash from operating activities is operating profit and working capital. When working capital decreases i.e current assets decreases and current liabilities increases except cash, there is inflow of cash. Similarly, under financing activities, issue of shares and borrowing makes cash inflow. Mire cash was seen out flowed from investing activities and it sir because to operate and expand services, an enterprise has to purchase more plant and machinery as well as it has to invest in other hydro project too. Thus, there is cash outflow due to investment purpose.

The following diagram shows the proportion between cash inflow and outflow:

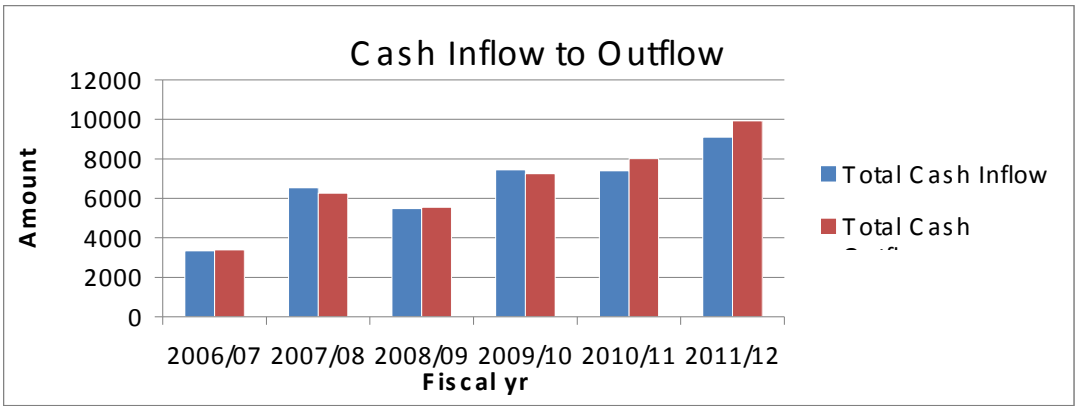


Figure 18: Cash Inflow to Outflow

The above table and diagram shows there was likely equal proportion of cash inflow and outflow. That means, cash obtained from operating and financing activities are utilized in investing activities. In 2006/07, 2007/08, 2008//09 and 2009/10, cash outflow was greater than cash inflow. It indicates, NEA used excess cash from cash and bank balance. In remaining years, cash inflow was a bit greater than cash outflow and excess cash inflow was added in cash and bank balance.

4.10.4 Cash flow Liquidity ratio

This ratio is used to test the company's short-term debt paying ability. Short term debt refers to account payable, sundry creditors, bills payable etc.

$$\text{Cash flow Liquidity Ratio} = \frac{Cash\ flow\ from\ operating\ activities\ Zcash/bank\ balance}{current\ liabilities}$$

Table 19
Cash flow Liquidity ratio

NRs. in million

Fiscal year	CFOA	Cash/Bank balance	CL	Ratio
2006/07	2335.16	1036.42	13856.61	0.24
2007/08	2944.07	1322.6	16758.69	0.25
2008/09	2570.2	1258.6	19144.39	0.20
2009/10	3615.75	1447.58	22119	0.23
2010/11	2991.93	820.84	25617.71	0.15
2011/12	2043.33	697.11	27599.46	0.10

Source: Table 3

From the above table, the ability to pay short-term debt has identified very poor during the study period. Since, the ratio was observed positive which indicated that the company had ability to pay short-term debt to some extent but it was not satisfactory due to low liquidity ratio. Moreover the ratio was fluctuating which indicated NEA was not consistent in increasing its ratio flow liquidity ratio. It can be shown with following trend line:

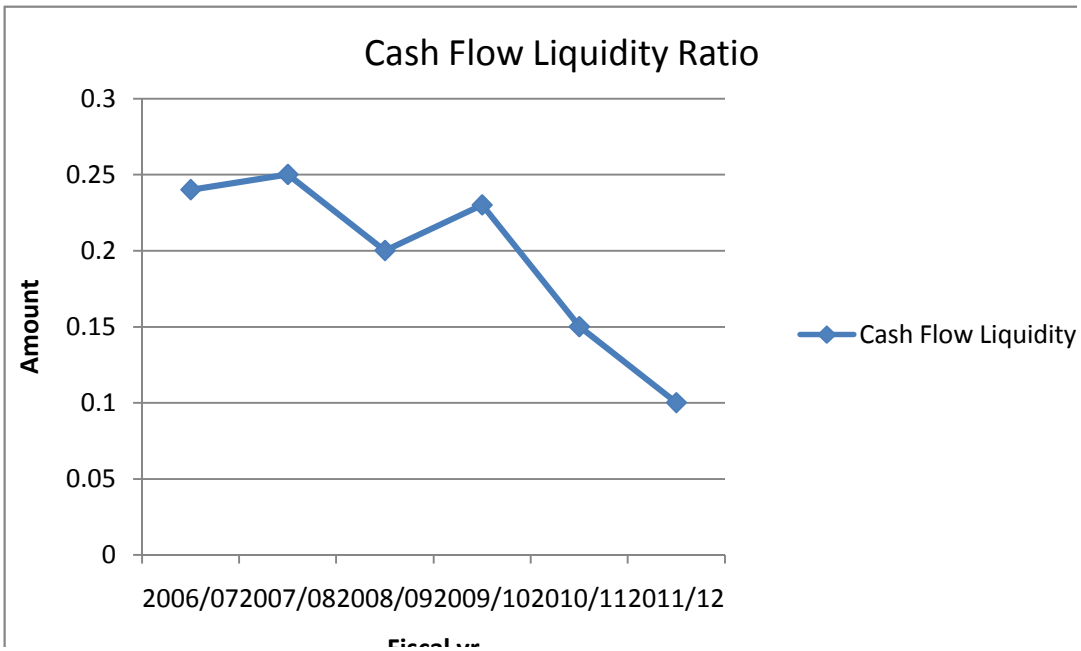


Figure 19: Cash Flow Liquidity Ratio

The above trend line shows the inability of NEA to pay its short-term debt because the ratio falls below one. The ratio above one signifies the ability of NEA to pay its short-term debt which we did not find. So, the company should extend its operation effectively to generate more cash inflow and should maintain more cash and bank balance at the end of each year.

4.10.5 Cash Turnover Ratio

Cash turnover ratio is similar to cash flow on revenue ratio. Cash flow revenue ratio measures the company's ability to turn sales revenue into cash from operation activities where as cash turnover ratio measures the company's ability to turn sales revenue into cash and bank balance.

$$\text{Cash Turnover Ratio} = \frac{Cash\,and\,Bank\,Balance}{Sales}$$

Table 20

Cash Turnover Ratio

NRs. in million

Fiscal year	Cash/bank balance	Sales	Ratio
2006/07	1076.15	11874.7	0.08
2007/08	1036.42	12605.2	0.11
2008/09	1322.6	13331.9	0.09
2009/10	1258.6	14449.73	0.10
20010/11	1447.58	15405.03	0.05
2011/12	697.11	15220.87	0.04

Source: Table 3, Appendix IV and V

The cash balance of the company should be optimum to meet its current obligations. The cash turnover ratio explains how quickly cash is recovered from sales. Higher ratio indicated the company's sound liquidity position and vice-versa. However, high ratio though considered as good, it also signifies excess cash balance held idle which decreases the opportunity to generate more cash.

The above table shows that NEA has fluctuating cash turnover ratio. Higher ratio was obtained in fiscal year 2007/08 i.e 0.11 which indicated in that yr more sales revenue turned into cash and lowest ratio was obtained in fiscal year 2011/12 i.e. 0.04 which indicated, NEA made more expenses and spent more cash on investment which ultimately result to lower cash and bank balance.

Statistical Tool:

Table 21

Correlation between cash balance and sales

NRs. in million

Sales (X)	Cash balance (y)	x= X-13331.9	Xy	X^2	Y^2
-1874.7	1036.42	-1457.2	-1510271.224	2123431.84	1074166.416
-2605.2	1322.6	-726.7	-961133.42	528092.89	1749270.76
-3331.9	1258.6	0	0	0	1584073.96
14449.73	1447.58	1117.83	1618148.351	1249543.909	2095487.856
15405.03	820.84	2073.13	1701708.029	4297867.997	673778.3056
15220.87	697.11	1888.97	1316819.877	3568207.661	485962.3521
	ϕy=6583.15	ϕx=2896.03	ϕxy=2165271.613	ϕx^2=11767144.3	ϕy^2=7662739.65

Source: Table 3, Appendix IV and V

$$r = \frac{n \quad xy\,Z \quad x \quad y}{\sqrt{n \quad x^2\,Zf \quad xA^2}\sqrt{n \quad y^2\,Zf \quad yA^2}}$$

$$= \frac{6*2165271.613\,Z\,2896.03*6583.15}{\sqrt{6*11767144.3\,Z\,(2896.03)^2}\sqrt{6*7662739.65\,Z\,(6583.15)^2}}$$

$$= \frac{-6073370.22}{7887.70 * 1624.37}$$

= -0.47

Since the value of r is -0.47, there is negative correlation between sales revenue and cash/bank balance. It means, higher the sales revenue lower will be the cash/bank balance. It might be due to more investment of cash.

Again,

$$\text{P.E.} = 0.6745 \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 * \frac{1-(-0.47)^2}{\sqrt{6}}$$

= 0.21

Now,

6 P.E = 6* 0.21

= 1.29

Since r < 6 P.E i.e. -0.47 < 1.29. We can that the ascertained value of correlation coefficient, r is insignificant. It means, there is perhaps no evidence of correlation.

4.11 Regression and Trend Analysis

Above we have used correlation as a statistical tool to analyze the data. Here are some more statistical tools that are used in the study.

Regression: Regression is a statistical tools used to define relationship between two (or more) variables and to make estimation or one variable on the basis of the other variable(s). The closer the relationship between the two variables, the more accurate the estimated value is. The unknown variable to b estimated is called dependent variable and the known variable is called independent variable.

Correlation analysis indicates to what degree the variables are related and regression analysis indicates how the variables are related.

Trend Line: A series formed from a sequence of statistical data arranged in accordance with their time of occurrence is said to be a time series. Mathematically, a time series is defined by the functional relationship y= f (t), where y is the value if the variable under consideration in time t. the time t id taken yearly, Trend Line is taken as an example of time series.

The information in statement of cash flows also assists in predicting the ability to generate future cash flows. Here an effort is made to find out the future cash flows of NEA for the F.Y 2006/07 to 2011/12 For this, cash from operating, investing and financing activities are calculated by fitting the straight trend line considering operation, investing and financing activities as dependent variable and sales revenue as independent variable.

4.11.1 Estimation of sales Revenue using Trend Line Analysis

Fitting the trend line taking fiscal year (x) as independent variable and sales revenue (y) as dependent variable, we can predict future sales revenue as follows.

Table 22

Trend Analysis of sales Revenue

NRs. in million

Fiscal year (x)	Sales revenue (Y)	X=X-2006	Xy	X^2
2005	11874.7	-2	-23749.4	4
2006	12605.2	-1	-12605.2	1
2007	13331.9	0	0	0
2008	14449.73	1	14449.73	1
2009	15405.03	2	30810.06	4
2010	15220.87	3	45662.61	9
	ϕy=82887.43	ϕx=3	ϕxy=54567.8	ϕX^2=19

Source: Appendix IV

In the above table, fiscal year 2005 refers to 2004/05.similarly, 2006 refers 2005/06. 2007 refers to 2006/07. 2008 refers to 2007/08, 2009 refers to 2008/09 and 2010 refers to 2009/10.

The trend line of dependent variable sales revenue (y), and independent variable, variable fiscal yr (x) is expressed by,

Y = a + bx……equation (i)

We know that,

$$b = \frac{n \quad xy \, Z \quad x \quad y}{n \quad x^2 \, Z(\quad x)^2}$$

$$a = \frac{y}{n} Z b \frac{x}{n}$$

Now,

$$b = \frac{78744.51}{105}$$

$= 749.95$

Again,

$$a = \frac{82887.43}{6} Z 749.95 * \frac{3}{6}$$

$= 13439.6$

Now, substituting the value of a and b in equation I, we get

Y = 13439.6 + 749.95x

The above equation of trend line shows the sales revenue for the next year, thus, estimation of the sales revenue for the coming three years is:

1. For 2011 (2010/11)

X=X – 2006

= 2010 – 2006

= 4

And,

Y = 13439.6 + 749.95x

= 16439.4

2. For 2012 (2011/12)

X = X – 2006

= 2011 – 2006

= 5

And,

Y = 13439.6 7+ 49.95x

= 17189.35

3. For 2013 (2012/13)

X = X – 2006

= 2012 - 2006

= 6

And, Y = 13439.6 +749.95x

= 17939.3

The above computation of future sales revenue can be shown with following trend line:

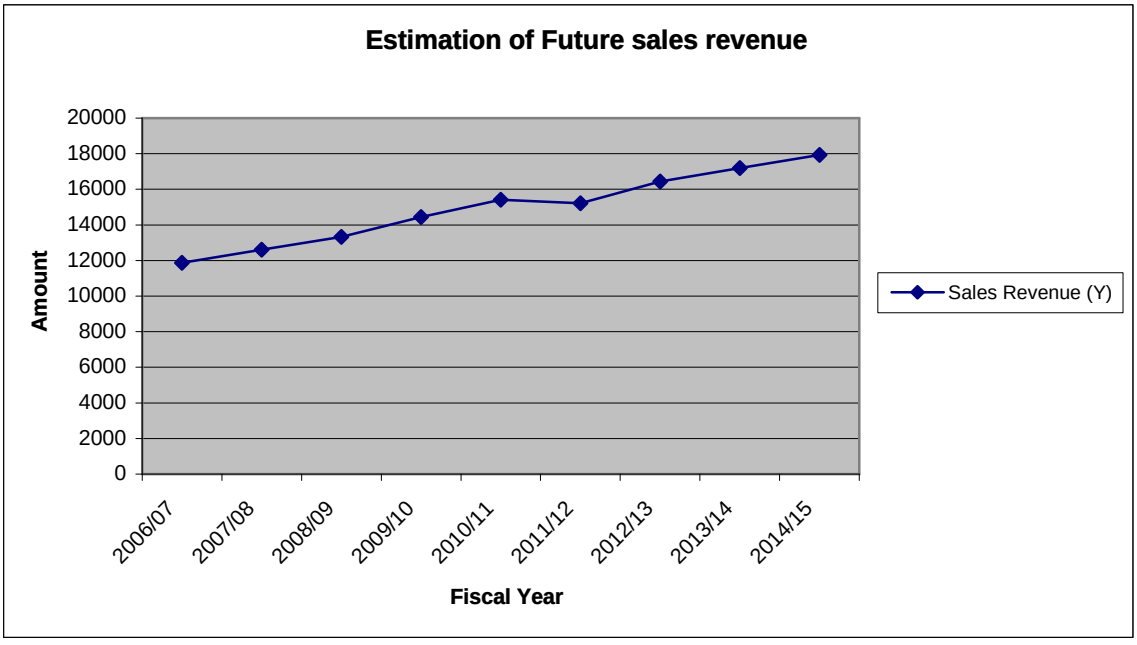


Figure 20: Estimation of Future Sales Revenue

From above trend line, it is observed that sales revenue ids in increasing trend in the future as well. But the most important fact we should be acknowledged about is, the above trend line is possible only when there is no any risk factors exists. Risk factors refers load shedding, strike etc. if there exists such a risk factors, then the above calculated future sales revenue will be difficult to achieve. In the present scenario, we are suffering from 16 hr of load shedding daily. In this context, it is very hard to get above mentioned revenue.

Thus, it can be said that, if the entire risk factors do not exists then above trend of sales revenue can be achieved.

4.11.2 Estimation of CFOA using Regression Analysis

Here, since CFOA is directly dependent on revenue, revenue is considered as independent variable and CFOA as dependent variable.

Here,

Mean Sales ($\overline{x}$) =13647.91

Mean CFOA ($\overline{y}$) =2750.07

∴ byx = 0.16

CFOA for 2010/11 = 2063.90

CFOA for 2011/12 = 2183.89

Source: Appendix I

Above mentioned future CFOA can be shown with the following trend line:

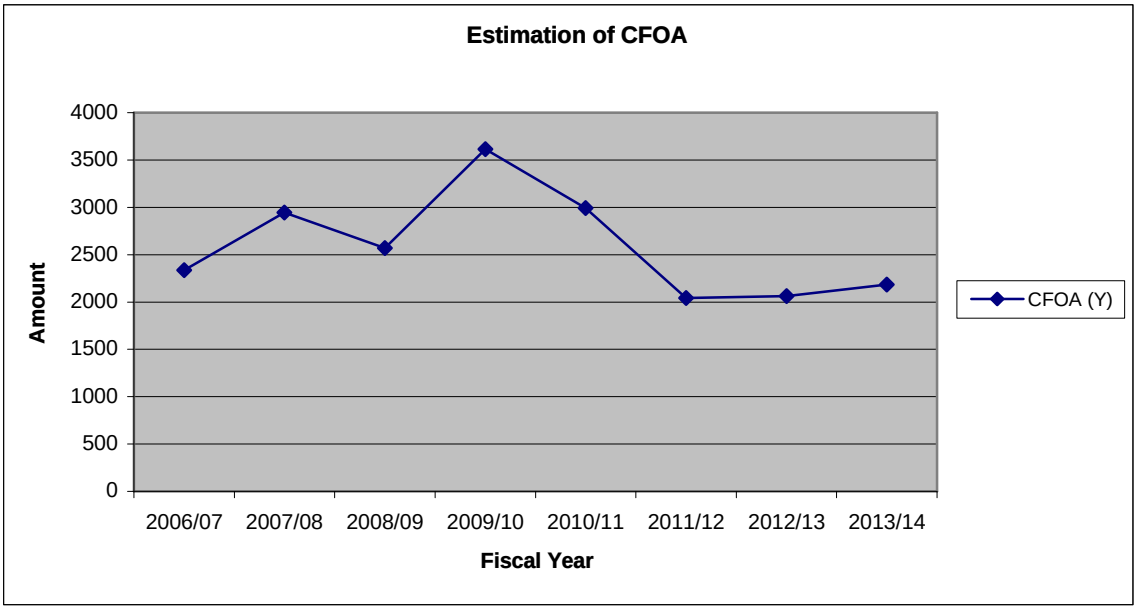


Figure 21: Estimation of CFOA

From above trend line, it is observed that if all the risk factors do not exists, then the future CFOA would be Rs.2063.9 million in 2012/13 and Rs.2183.89 million in 2013/14

4.11.3 Estimation of CFIA using Regression Analysis

Here,

Mean Sales ($\overline{x}$) = 13814.57

Mean CFIA ($\overline{y}$) = -6615.04

∴ byx = -1.30

CFIA for 2010/2011 = -10027.32

CFIA for 2011/2012 = -11002.26

Source: Appendix II

The above computed future CFIA can be shown with following trend line:

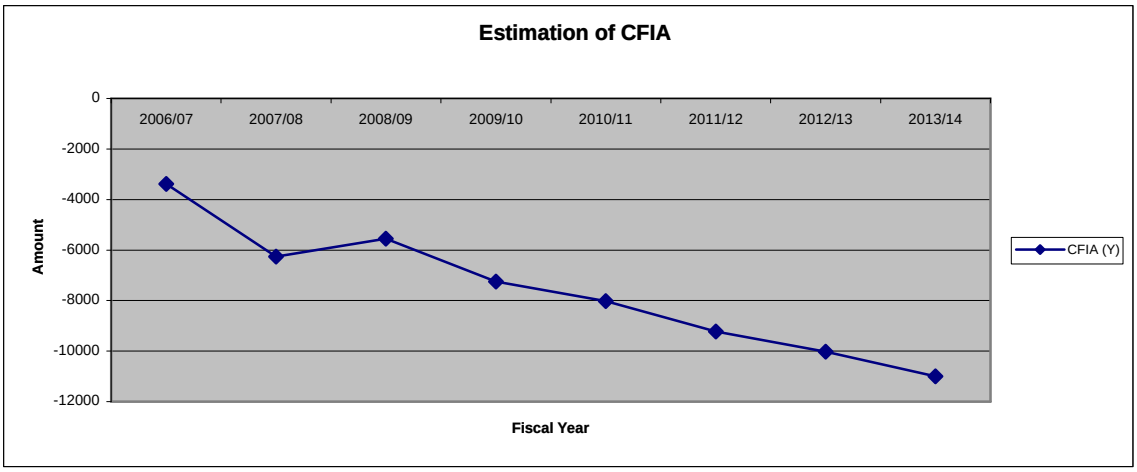


Figure 22 : Estimation of CFIA

From the above estimation and the trend line, it is observed that the CFIA in 2012/13would be Rs. (10027.32) million and in 2013/14 it would be Rs. (11002.26) million. It indicates, the investment is going to be decreased in the coming yrs.

4.11.4 Estimation of CFFA using Regression Analysis

Here,

Mean Sales ($\overline{x}$) = 13814.57

Mean CFFA ($\overline{y}$) = 3801.79

- byx =1.12

CFFA for 2010/2011 = 6741.2

CFFA for 2011/2012 = 7581.54

Source: Appendix III

It is shown with the following trend

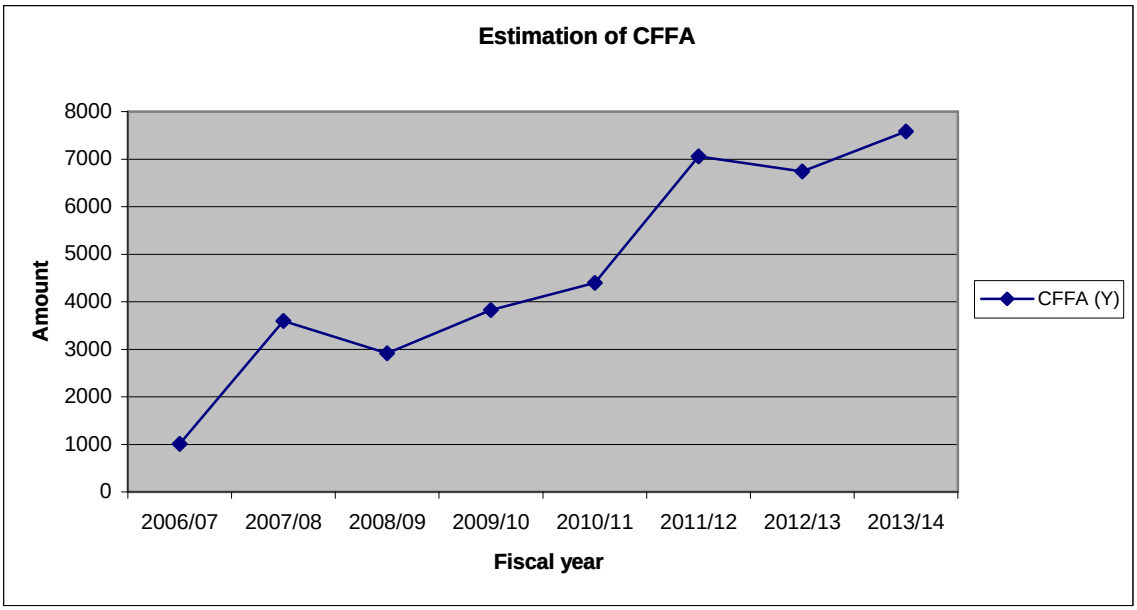


Figure 23: Estimation of CFFA

From the above figure, it is noted that CFFA in 2012/13 would be Rs.6741.6 million and in 2013/14 it would be Rs.7581.54 million. It signifies, more cash is going to be generated in the future from financing activities the thing that is to be noted is above value are determined without considering the risk factors. It excludes all the risk factors. Thus, if there exists any risk factors then above ascertained value might be changed.

4.12 Research Hypothesis

Testing of hypothesis is one of the most important aspects of the theory of decision making. It consists of decision rules required for drawing probabilistic inferences about the population parameters. Hypotheses are an assumption that is made about the population parameter and then its validity is tested. The act of verification involves testing the validity of such assumption which when undertaken on the basis of sample evidence is called statistical hypothesis or testing of significance. In this section, it is best tried to create some hypothesis regarding cash flows and earning, so as it is tested.

The following research hypotheses have been formulated in relation to the research questions.

4.12.1 Research Hypothesis 1:

Past earnings have significant predictive power in predicting future cash flows of Nepal Electricity Authority.

Table 23

Table of Testing of Research Hypothesis 1

NRs. in million

Fiscal year	revenue (x)	x=X-13331.9	x^2
2006/07	11874.7	-1457.2	2123431.84
2007/08	12605.2	-726.7	528092.89
2008/09	13331.9	0	0
2009/10	14449.73	1117.83	1249543.909
2010/11	15405.03	2073.13	4297867.997
		$\sum x$=1007.06	$\sum x^2$=8198936.64

Source: Appendix IV and V

Here, n = 5

⇑ = 15689.45 (estimation of sales revenue for 2010/11 as calculated in 4.11.1)

= 15220.87 (taking from income statement of NEA for 2010/11)

$$\exists = \sqrt{\frac{1}{n\,Z1} * \quad x^2\ Z\frac{(\quad x)^2}{n} \quad * \frac{(n\,Z1)}{n}}$$

$$= \sqrt{\frac{1}{4} * (8198936.64\ Z\frac{(1007.06)^2}{5} \quad * \frac{4}{5}}$$

= 1264.60

Where,

n = sample size

⇑ = population mean

= sample mean

∃ = standard deviation of population

Now,

Ho: ⇑ = 15689.45 that is population mean has significant value. In other words, there is no significant different between populations mean (derived from past earning) and sample mean. i.e. past earnings have significant predictive power in analyzing cash flows of Nepal Electricity Authority.

H1: ⇑ ≠ 15689.45 that is population mean is not equal to 15689.45. In other words, there is significant different between populations mean (derived from past earning) and sample mean. I.e. past earnings doesn't have significant predictive power in analyzing cash flows of Nepal Electricity Authority.

Test Statistic: Under Ho, the test statistic is,

$$t = \frac{\overset{z}{X} Z\text{«}}{\pm \sqrt{(n Z 1)}} = \frac{1522087 Z 15689.45}{\frac{1264.60}{\sqrt{4}}} = -0.74$$

Hence, /t/ = 0.74

Degree of freedom (d.f.) = n – 1 = 5-1 = 4

The tabulated value of t for 4 d.f. for two tailed test at 5% level of significant is 2.776. Thus, the tabulated value /t/ = 2.776

Decision:

Since calculated value of t i.e. /t/ = 0.74 is lesser than tabulated value of t i.e. /t/ =2.262, it is not significant and Ho is accepted. Ti means population mean has significant value. In other words, there is no significant different between populations mean (derived from past earning) and sample mean, i.e. past earnings have significant predictive power in analyzing cash flows of Nepal Electricity Authority.

4.12.2 Research Hypothesis 2:

Past cash flows are significant predictors of future cash flows of Nepal Electricity Authority:

Table 24

Table of Testing of Research Hypothesis 2

NRs. in million

Fiscal year	CFOA (x)	x=X-2944.07	x^2
2006/07	2335.16	-608.91	370771.3881
2007/08	2944.07	0	0
2008/09	2570.2	-373.87	139778.7769
2009/10	3615.75	671.68	451154.0224
2010/11	2991.93	47.86	2290.5796
		$\sum x=-263.24$	$\sum x^2=963994.77$

Source: Table 3

Here,

n =5

⇑ = 1943.91 (from table no: 23 figures estimated by regression equation fro 2010/11)

= 2043.33 (taken from CFOA of NEA for 2010/11)

$$\exists = \sqrt{\frac{1}{n\,Z1} * \quad x^2\ Z\frac{(\quad x)^2}{n} \quad * \frac{(n\,Z1)}{n}}$$

$$= \sqrt{\frac{1}{5\,Z1} * 963994.77\ Z\frac{(Z263.24)^2}{5} \quad * \frac{(5\,Z1)}{5}}$$

= 435.92

Where,

n = sample size

⇑ = population mean

= sample mean

∃ = standard deviation of population

Now,

Ho: ⇑ = 3334.49 that is population mean has significant value. In other words, there is no significant different between populations mean (derived from cash flows) and sample mean. i.e. past cash flows have significant predictive power in analyzing cash flows of Nepal Electricity Authority.

H1: ⇑ ≠ 3334.49 that is population mean is not equal to 3334.49. In other words, there is significant different between populations mean (derived from past cash flows) and sample mean. i.e. past cash flows doesn't have significant predictive power in analyzing cash flows of Nepal Electricity Authority.

Test Statistic: Under Ho, the test statistic is,

$$t = \frac{\overset{z}{X} Z\text{«}}{\pm \sqrt{(n Z 1)}} = \frac{2043.33 Z 1943.91}{435.92 \sqrt{(5 Z 1)}} = -0.46$$

Hence, /t/ = 0.46

Degree of freedom (d.f.) = n – 1 = 5-1 = 4

The tabulated value of t for d.f. 4 for two tailed test at 5% level of significant is 2.776. Thus, the tabulated value t = 2.776

Decision:

Since calculated value of t i.e. /t/ = 0.46 is lesser than tabulated value of t i.e. /t/ =2.776, it is not significant and Ho is accepted. It means population mean has significant value. In other words, there is no significant different between populations mean (derived from past cash flows) and sample mean, i.e. past cash flows have significant predictive power.

4.13 Major Findings

The major findings after detail analysis of cash flow of NEA are presented below:

1. From the income statement it is observed that NEA is suffering from loss except in 2009/10. However, cash flow statement indicates there is cash

inflow from operating activities. It is because; income statement includes non operating expenses where as cash flow statement excludes all such items.

2. Net cash from operationg activities of NEA was increased in fiscal year 2007/08 but decreased in 2008/09 and again increased in 2009/10 and decreased in 2010/11 and 2011/12. it indicates that NEA fails to maintain increasing trend of CFOA.
3. CFIA of NEA was observed negative during the study period. It was Rs. (3384.46), Rs. (6256.26), Rs.(5550.82), Rs.(7254.22), Rs.(8017.89) and Rs.(9226.57) million. it is seemed that CFIA of NEA is increased in fiscal year 2007/08 by 84.85% than in fiscal year 2006/07.
4. CFFA of NEA was in increasing trend except fiscal year 2008/09.The amount increased by 256.43% in 2007/08 but decreased by 18.95% in 2008/09 and increased in the other remaining year.
5. The net cash flow of NEA is increse in 2007/08 and 2009/10 but rapidly decresed in a heavy amount in 2010/11.it shows negative net cash flow.
6. The NEA has increasing trend of actual operating profit till 2009/10 then slightly decreases in 2010/11 and went negatively in 2011/12.
7. Cash and bank balance of NEA was fluctuation from 2006/07 to 2011/12. Cash balance was decreasing and increasing trend subsequently .
8. Cash flow adequacy ratio of NEA is increasing in the first four years and decreasing in the last two years during the study period.it starts increse till 2009/10 having the ratio above one and finally in the last two years it again downfalls to below one.
9. The repayment of borrowin ratio of NEA was 4.12%,4%,4.27%1.2%5.27% and 3.87 from 2006/07 to 2011/2012 respectively . it indicates NEA has been paying very litle amount of debt out of its total amount of long term debts.
10. Reinvestment ratio of NEA was decreasing till 2009/10 which refers investment done in purchasing plant and equipment is decreasing .But incresed the ratio in 2011/12 that is 12.91%. which indicates NEA has purchased palnt and equipment more than its CFOA.
11 NEA is not consistent in converting sales revenue into cash. In 2008/09, it de creased, in 2009/10, it increased and again in 2010/11 it decreased.

12 Cash flow return on assets ratio of NEA moves in decreasing trend . In 2006/07 the ratio is 0.085 and in 2011/12 is 0.045 which shows NEA is unable to use its resources effectively and to the fullest.

13. NEA has cash inflow from operating and financing activities and it flows to investing activities. The ration between cash inflow and outflow can be considered satisfactory but since long term debt is obtained through financing activities and return and repayment of it is nominal. It can be said that cash inflow from financing activities has no significance. Moreover, it is suffering from unnecessary interest burden.

14. Cash flow return on stockholders equity shows the fluctuation in the ratio .That means NEA was not constient in maintaining cash flow return on stockholders equity as well as .

15. Cash flow liquidity ratio of NEA is 0.24 in 2006/07,0.23 in 2009/10 and 0.10 in 2011/12 which shows the inability of NEA to pay its short term debts because the ratio falls below one.

16. NEA has fluctuing cash turnover ratio. Higher the ratio was obtained in fiscal year 2007/08 i.e.0.11 which indicated more sales revenue into cash and lowest ratio was in 2011/12 i.e.0.04 indicated NEA made more expenses.

17 The correlation between sales revenue and CFOA is 0.14, which shows there is positive but lesser relationship between two variable . correlation between net profit and CFOA is 0.87 which indicate that there is highly positive correlation between two variable.

18. The long-term solvency position of the company was satisfactory as it has used relevant amount of debt as compared to equity

19. The liquidity position of NEA is not satisfactory as a current liability is greater than current assets.

CHAPTER – V

Summary, Conclusion and Recommendations

5.1 Summary

The study is based on cash flow analysis of NEA. It is one of the largest public organizations of Nepal. It has been supplying electricity continually and it has been making significant contribution to the economic development of the country. It has been trying to improve itself as a capable institution in copying with the new policy guidelines of the elected government by adopting itself within the framework of Nepal government's objectives aimed at liberalization of economy and a transition to a market oriented economy based on competition and efficiency. For over decades, it has been the only supplier of electricity in the country, it has monopoly in the market.

Though Nepal is rich in water resources, it still facing the problem of load shedding. According to the researchers, engineers, the potentiality of hydro-electric of Nepal is 83,000 M.W. but only about 544 M.W. is generated. In winter season, even 544 MW is difficult to generate. There is consensus that development of its abundant water resources could largely benefit the nation.

For effective performance, NEA needs to generate sufficient amount of cash which is considered as the lifeblood of business enterprise. Without cash no activities can take place. So the business must have an adequate amount of cash to operate. It is also important to know the cash position of the firm and to know the cash position, it is important to analyze cash flow of the firm. Cash flow analysis provides useful information to evaluate a firm's ability to have sufficient cash in both short term and long term basis. It is the analysis of events and transactions that affect the cash position to company, cash flow analysis is done through statement of cash flow. The cash flow statement is the accounting report that provides information above cash receipts, payments and net change in cash balances during the period. The main objective if the cash flow statement is to convey information about the cash receipts and cash payments of an enterprise during the accounting period. It is important and useful to every firm, short term creditors, investors and management.

The balance sheet, income statement and retained earnings statement do not always show the whole financial condition of a company. The balance sheets show the variety of assets owned by a company and the manner in which they were finance at the end of period but the sources of activity related to those items during the period are not provide. Also profit in the income statement does not reflect increase cash. Moreover, the profitability and financing issues are reported separately income statements and balance sheets respectively. This causes misleading at confusing results to users. That is why it is important to prepare cash flow statement to ascertain true and fair figure of cash inflow and outflow and important to analyze it to find out the actual cash position of the organization.

For the purpose of conducting this study, data covering from fiscal yr 2006/07 to 2010/11 are used. Cash flow statements for every fiscal yr are prepared to find out cash inflow and outflow from operating, investing and financing activities. From cash flow statement, it is observed that net cash from operating and financing activities are positive and due to more investment in plant and equipment, net cash from investing activities are negative. Furthermore various cash flow ratios are statistical tools are used to evaluate cash. The cash and bank balance of NEA was not satisfactory during the study period. The enterprise was not able to generate sufficient cash inflows from its operating activities. The amount of net cash provided by operation is not adequate to support the planned business operation and capital expenditure. Due to poor cash inflows from operating activities, the company has depended on long-term borrowing and unsecured borrowing, the company has paid huge amount of interest due to more long-term debt. So the company needs to change its strategies and replace its high interest rate of debt by lower interest rate of debt. On the other hand it can call the money by issuing shares to the public which will reduce debt and interest. Due to inefficiency of generating sufficient operating cash flow and more investing in fixed assets with a lower rate of return, it is unable to pay both the short term and long term debt. During study period, it is observed that NEA has been facing many problems such as more amount of account receivable less utilization of capacity, power loss etc. which are the major cause to reduce its profit.

If it can be properly controlled and managed, then there would be increase in its profit.

5.2 Conclusion

After analyzing in detail the cash flow of NEA, the following conclusions are made:

1. Though income statement of NEA shows loss figure, cash flow statement shows, it has been achieving operating profit. It is because income statement includes non operating expenses while cash flow statement excludes such expenses.
2. NEA has maintained positive CFOA but was fluctuating.
3. It has invested its huge amount of cash obtained from operating and financing activities in purchasing property, plant and equipment.
4. It has high fixed assets but the return from it is very low.
5. Proportion of borrowing of loan by it is very high than repayment of borrowing of loan. So, there is increasing in cash inflow from CFFA and that is why NEA has been paying huge amount of interest on long term debt.
6. NEA is holding cash inconsistently and utilizing it not properly. There was very fluctuation in handling the cash which might not be in the favor of an enterprise.
7. Cash flow adequacy ratio indicates that an enterprise was able to generate cash inflow to acquire assets to some extent but it was not satisfactory since there was up and down in maintaining the ratio.
8. NEA is not able to generate adequate amount of cash from operating activities to pay its total debt but to some extent it is being able to improve its cash position.
9. NEA is very much dependent on foreign loan to pay its local debt and that is why its long term loan has been increasing.
10. NEA is not fully able to convert its revenue to cash. Moreover, it is not consistent in generating cash from revenue. Non operating expenses have been increasing every yr.
11. NEA has ability to pay short term debt to some extent but it was not satisfactory due to low liquidity ratio and it was not consistent in increasing the cash flow liquidity ratio.
12. NEA was unable to use its resources to the fullest. NEA has a poor management and strategic policy. Total assets have been increasing but CFOA

is not increasing proportionately which indicated return from its total assets is not satisfactory.

13. Electricity leakage, theft and wastage is one of the remarkable problem of NEA which reduces the profit earning capacity of the authority.
14. The accumulated amount of account receivable which is increasing year by year denotes the inefficiency of the authority to collect its revenue in time.
15. Increasing trend of cost in each fiscal year is another remarkable point for NEA. It hasn't adopted the cost control measures.
16. The company is not holding optimum level of cash balance at the end of each year. Shortage of cash provides difficulties in operation of the services and excessive cash contribute nothing to the profit since idle cash earn nothing.
17. NEA fails to analysis its strengths, weakness, opportunities and threat deeply though it has facing competition from independent power producers and it has not yet made assessment of its present prospects and future potentiality seriously.
18. NEA doesn't maintain ling run planning and policy regarding financing and investment. That is why; long term debt is increasing and fails to invest where there would be high return.
19. NEA has monopoly in the market and thus it has sole power in generation and sales of electricity but unstable government and political interference affect it too badly.
20. Past cash flows and earnings of it has significant predictive power in analyzing future cash flow.

5.3 Recommendations

After the detail analysis of cash flow of NEA, the following suggestions are recommended:

1. The balance sheet and income statement do not always show the whole financial condition of a company. That is why it is important to prepare cash flow statement to ascertain true and fair figure of cash inflow and outflow.
2. NEA must restructure its capital structure and should emphasize the internal financing to minimize the burden of high interest of ling term loans. For this, it can issue shares.

3. Electricity loss is increasing each year. Thus, leakage of electricity should be controlled. For this, meter reading and meter joining system should be improved. The most important aspect is to motivate its employees who engaged in transmission and distribution line to control the leakage. Rules and regulations should be strictly implemented to control the leakage and those staffs who are themselves engaged in encouraging power leakage should be investigated and strictly be demoralized.
4. The liquidity position of NEA is not satisfactory, so it should be corrected by increasing current assets and decreasing current liabilities.
5. NEA should develop efficient system of revenue collection. It should make well defined rules and regulations in regard of revenue collection and it the customer of any category delays or denies. It should be charged penalty. In revenue collection, any kind of pressure and biases should strictly be undermined. Huge amount of account receivable especially of Municipality, Metropolis, Sub Metropolis consumed in street lights should be managed and receivable can be collected by imposing its expenditures to the neighboring community people.
6. NEA should stress on efficient utilization of fixed assets. Amount should not be tied up haphazardly in plant and high cost assets. For this, NEA should develop and apply capital budgeting technique more effectively. The sales revenue is to be generated in comparison with the amount tied up in assets.
7. The installed capacity of NEA should be utilized fully. It utilizes its full capacity, the operating expenses will down.
8. NEA should have an efficient management system to have control over costs. It must maintain fixed cost to minimum standard level.
9. NEA should follow tight collection policy to collect account receivable in time. Collection policy should not be influenced by political pressures.
10. The enterprise has earned low return from investing activities. Before making decision on capital investment, the company should evaluate the alternative projects and choose that investment alternative which will have more expected cash flow in future.
11. The company has excessive stock. So it is better to keep the optimum level of inventory to reduce the cost associated with inventory management of turn

over inventory as quickly as possible, avoiding stock outs that may result in a loss of sales.

12. The company should accurately forecast the amount and timing of cash flows so that borrowings can be minimized.
13. NEA is suffering from loss according to statement and it is due to excess amount of non operating expenses, non performing assets. NEA should reduce such items.
14. The company had held unstable cash balance during the study period which indicated the company had not maintained optimum cash balance. Thus, NEA should hold cash balance according to the requirement of the company and should invest in liquid assets instead of cash saving.
15. Investing activities were financed by raising secured ling-term. So, the company should operate in such a way that all the investing activities should be able to cover long-term financing.
16. NEA should maintain optimum level of staff. It reduces unnecessary overstaffing cost and help to increase its efficiency and revenue.
17. NEA is also recommended to prepare monthly budgets regarding sales, production, and cash alongside cash flow statement.

5.4 Implementation Procedure of NEA

A new implementation procedure of NEA is Generation Expansion Plan study for the planning period FY 2005/06 – 2019/20 was carried out. The results of study are presented as follow:

Table 25

Generation Expansion Plan

Fiscal Year	Projects	Installed capacity (MW)
2005/06	Chaku Khola	1.5
2006/07	Baramchi	0.98
	Khudi	3.5
	Sisne Khola	0.75
2007/08	Pheme	0.95
	Lower Nyadi	4.5

	Lower Indrawati	4.5
	Mailing	5
	Mardi	3.1
	Thoppal Khola	1.4
	Middle Marsyangdi	70
2008/09	Darma Khola	5
	Upper Modi	14
	Kulekhani – III	14
2009/10	Madi – 1	10
	Hewa	10
	Mewa	18
	Lower Modi	19
2010/11	Kabeli – A	3
	Upper Marsyangdi – A	50
	Rahughat	27
2011/12	Tamur	83
	Likhu – 4	51
	Upper Modi A	42
	Chameliya	30
	Budhiganga	20
2012/13	Upper Karnali – A	75*
	Upper Seti(ST)	122
2013/14	West Seti	75*
2114/15	Upper Tamakoshi	309
2015/16	-	-
2016/17	-	-
2017/18	Dudh Koshi	300
2018/19	-	-
2019/20	Andhi Koshi	180

*Nepal Entitlement from export oriented project

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Appendixes

Appendix I

Regression Analysis of CFOA

NRs. in million

Sales (x)	CFOA (y)	d1 =x-13331.9	d2 = y-2570.2	d1d2	$d1^2$	$d2^2$
11874.7	2335.16	-1457.2	-235.04	342500.288	2123431.84	55243.8016
12605.2	2944.07	-726.7	373.87	-271691.329	528092.89	139778.7769
13331.9	2570.2	0	0	0	0	0
14449.73	3615.75	1117.83	1045.55	1168747.157	1249543.909	1093174.803
15405.03	2991.93	2073.13	421.73	874301.1149	4297867.997	177856.1929
15220.87	2043.33	1888.97	-526.87	468371.6239	790267.6609	277591.9969
		$\sum$d1=1896.03	$\sum$d2=1079.24	$\sum$d1d2=1645485.61	$\sum d1^2$=8989204.29	$\sum d2^2$=1743645.57

Here, no. of yr (n) = 6

$$\text{Mean } (\bar{x}) = a + \frac{\sum d1}{n}$$

$$= 13331.9 + \frac{189603}{6}$$

$$= 13647.91$$

$$\text{Mean } (\bar{y}) = b + \frac{\sum d2}{n}$$

$$= 2570.2 + \frac{107924}{6}$$

$$= 2750.07$$

$$byx = \frac{n\sum d1d2 - \sum d1 \sum d2}{n\sum d1^2 - (\sum dl)^2}$$

$$= \frac{6 * 1645485.61 - 1896.03 * 1079.24}{6 * 8989204.29 - (1896.03)^2}$$

$$= 0.16$$

Now,

We know that,

Regression equation on y on x is,

$$y - \bar{y} = byx\,(x - \bar{x})$$

y- 2750.07 = 0.16 (x – 13647.91)

y = 0.16x – 566.40

From this equation we can forecast the CFOA based on sales as follow:

1. For 2010/11

X = sales = 16439.4 (from calculation of estimation of sales revenue)

Y = 0.16 * 16439.4 – 566.4

= 2063.90

2. For 2011/12

X = sales = 17189.35 (from calculation of estimation of sales revenue)

Y = 0.16 * 17189.35 – 566.4

= 2183.89

Appendix II

Regression Analysis of CFIA

NRs. in million

sales (x)	CFIA (Y)	d1 =x-14449.73	d2 = y-(-6256.26)	d1d2	$d1^2$	$d2^2$
11874.4	-3384.46	-2575.03	2871.8	-7394971.154	6630779.501	8247235.24
12605.2	-6256.26	-1844.53	0	0	3402290.921	0
13331.9	-5550.82	-1117.83	705.44	-788561.9952	1249543.909	497645.5936
14449.73	-7254.22	0	-997.96	0	0	995924.1616
15405.03	-8017.89	955.3	-1761.63	-1682885.139	912598.09	3103340.257
15220.87	-9226.57	771.14	-2970.31	-2290524.853	594656.8996	8822741.496
		Σd= -3810.95	$\sum d2$ =2152.66	$\sum d1d2$ = 12156943.14	$\Sigma\sum d1^2$ =12789869.32	$\Sigma\sum d2^2$ =21666886.75

Here, no. of yr (n) = 6

$$\text{Mean } (\bar{x}) = a + \frac{\sum d1}{n}$$

$$= 14449.73 + \frac{-3810.95}{6}$$

$$= 13814.57$$

$$\text{Mean } (\bar{y}) = b + \frac{\sum d2}{n}$$

$$= -6256.26 + \frac{-215266}{6}$$

$$= -6615.04$$

$$Byx = \frac{n\sum d1d2 - \sum d1 \sum d2}{n\sum d1^2 - \left(\sum d1\right)^2}$$

$$= \frac{6 * -12156943.14 - (-)3810.95 * (-)2152.66}{6 * 12789869.32 - (-3810.95)^2}$$

$$= -1.30$$

Now,

We know that,

Regression equation on y on x is,

$$y - \bar{y} = bxy(x - \bar{x})$$

$$y-(-6615.04) = -1.3\ (\ x - 13647.91)$$

$$y = -1.3x + 11343.9$$

From this equation we can forecast the CFIA based on sales as follows:

1. For 2010/11

X = sales = 16439.4 (from calculation of estimation of sales revenue)

$$Y = -1.3 * 16439.4 + 11343.9$$

$$= -10027.32$$

2. For 2011/12

X = sales = 17189.35 (from calculation of estimation of sales revenue)

$$Y = -1.3 * 17189.35 + 11343.9$$

$$= -11002.26$$

Appendix III

Regression Analysis of CFFA

NRs. in million

sales (x)	CFFA (Y)	d1 =x-14449.73	d2 = y-2916.62	d1d2	$d1^2$	$d2^2$
11874.4	1009.57	-2575.03	-1907.05	4910710.962	6630779.501	3636839.703
12605.2	3598.37	-1844.53	681.75	-1257508.328	3402290.921	464783.0625
13331.9	2916.62	-1117.83	0	0	1249543.909	0
14449.73	3827.45	0	910.83	0	0	829611.2889
15405.03	4399.22	955.3	1482.6	1416327.78	912598.09	2198102.76
15220.87	7059.51	771.14	4142.89	3194748.195	594656.8996	17163537.55
		$\sum d1$=-3810.95	$\sum d2$=5311.02	$\sum d1d2$=8264278.61	$\sum d1^2$ =12789869.32	$\sum d2^2$ =24292874.37

Here, no. of yr (n) = 6

$$\text{Mean } (\bar{x}) = a + \frac{\sum d1}{n}$$

$$= 14449.73 + \frac{-3810.95}{5}$$

$$= 13814.57$$

$$\text{Mean } (\bar{y}) = b + \frac{\sum d2}{n}$$

$$= 2916.62 + \frac{5311.02}{6}$$

$$= 3801.79$$

$$byx = \frac{n\sum d1d2 - \sum d1 \sum d2}{n\sum d1^2 - \left(\sum d1\right)^2}$$

$$= \frac{6 * 8264278.61 - (-)3810.95 * 5311.02}{6 * 12789869.32 - (-3810.95)^2}$$

$$= 1.12$$

Now,

We know that,

Regression equation on y on x is,

$$y - \bar{y} = byx(x - \bar{x})$$

$$y - 3801.79 = 1.12\ (x - 13814.57)$$

$$y = 1.12x - 11670.53$$

From this equation we can forecast the CFIA based on sales as follows:

1. For 2010/11

X = sales = 16439.4 (from calculation of estimation of sales revenue)

$$Y = 1.12 * 16439.4 - 11670.53$$

$$= 6741.6$$

2. For 2011/12

X = sales = 17189.35 (from calculation of estimation of sales revenue)

$$Y = 1.12 * 17189.35 - 11670.53$$

$$= 7581.54$$