# CHAPTER – I

## INTRODUCTION

### 1.1 BACKGROUND OF THE STUDY

The national income of a country is the main indicator of the development which is forecasted by Government every year at the end of each fiscal year. With this figure, a researcher can analyze the economic status of the particular country & its people. The economic picture represents the contribution made by various factor to the economy development like as agriculture, manufacturing, tourisms, hydroelectricity, construction, communication etc. According to Economic survey-2066/67, economy's incremental ratio was 3.5% which was lower than previous year i.e.4%. So, it is not good position of our nation. There are so many factors, like - political challenge, decreasing in social values, and lack of implementation of planning etc., that influence the economic growth of a nation. In context of Nepal, these all causes influences in each sectors of development although Nepal is a richest country in its natural resources. If we able to utilize only one natural resource, water, with dedicated mind, this country can be introduced as a developed country in the arena of world. But, now-a-days every sector is suffering from different kind of problems, like load shedding of electricity up to 16 hours in a day, problem to drink & supply of pure water etc. So, it is very-very dangerous for development. The wheel of development is accelerated by industrialization but due to lack of electricity no any business can be uplifted to achieve its goal. These all are happening due to lack of development of hydroelectricity.

Nepal is known for its hydropower potential. The studies undertaken till date have shown that the feasible potential is 83,000 MW. Of this development of 42,000 MW has been considered as technically and economically viable. With having 100 years great history on hydropower development, Chandrajyoti hydropower which was established in 1968 B.S., has reached in the load shedding position. Year

2009/10 witnessed new records of power and energy demand, generation and import. Annual peak demand was recorded 885.28 MW registering 8.96 percentage growth over 812.5 MW figure of previous year. Similarly annual energy demand was recorded 4367.13 GWh out of which 3076.69 GWh was contributed by domestic generation, 612.58 GWh was imported and rest 677.860 GWh was managed by load shedding (NEA, 2010:10). So, this is the latest position of demand & supply of electricity. Out of total supply of electricity, 26 percent electricity is fulfilled by privet & public sector.

"Private sector investment in the development of electricity was significant in the Ninth Plan period. In the Tenth Plan period, however, the investment of the private sector was not encouraging. The government sector also failed to make investment in this sector during the plan period. The capacity of electricity power generation is not sufficient to meet even the domestic demand in the absence of effective investment plan, at present. In this context, the possibilities of hydropower export and its contribution to overall economic development of the country, continues to remain as the major challenge. The Three Year Interim Plan intends to develop the hydropower potential of the country as an export commodity, expanding hydropower to the rural areas and providing quality services with low investment, within the framework and perspectives of the Hydropower Development Policy, 2001 and the 10 year & 20 year plans for hydropower development". Now, 58% of total population was reached to have access to electricity services by the end of the Three year Plan (064/65-066/67). On the latest plan, within 3 year, the access of electricity to the people will be 65% and the GOV of Nepal has maintained some budget for this. But it was not sufficient to maintain the crisis position on electricity, so the involvement of privet sector is most essential for the development of this area. Although it is very difficult to introduced new hydro project by ignoring of sufficient fund, but it is not impossible.

This research study only focuses two most popular hydropower companies namely CHILIME Hydropower Company limited (CHPCL) & Butwal Power Company Ltd. (BPC) who provided full satisfaction to its shareholders by providing dividend & earned goodwill in the share market. So, the researcher has done this search paper to analyze economic prospective of ongoing sample hydropower project in the background of Working Capital Management system & its effect.

## 1.2 INTRODUCTION TO SELECTED HYDROPOWER COMPANY:

### "Hydropower development Private sector's initiative

The government of Nepal has recognized the private sector role in harnessing water resources. From the 1990's subsequent to the adoption of the policy of economic liberalization, hydropower development took another new turn. The private sector directly and indirectly is being involved in generating hydroelectricity. The immediate reaction to the policy of economic liberalization has shown positive results in installing new hydropower projects in the country. The government has brought a hydropower policy (1992) in order to attract private investment. Again the government promulgated new Hydropower Development Policy (2001) with necessary amendments with the view to attract private sector investors for the development of hydropower. In response to the opening up the hydropower development strategy followed by the promulgation of favorable hydropower development policy to attract private producers, at the beginning, Nepal experiences a successful and encouraging story after 1990. There is an encouraging trend of development of hydropower through private producers. But the speed of installing new hydropower projects is very slow because of the inability of providing security.

The private producers would be able to invest their capital if the government

purchased their product at a reasonable price. Moreover private sector involvement in power generation requires enough potential market for the products. In addition, multilateral and bilateral cooperation is necessary to bring large hydroelectric projects under operation. The financial and technical cooperation is a must for the countries like Nepal but it is not only the solution for the hydropower development. Thus, there is an urgent need to explore viable regional market for the electricity generated from such large hydropower projects because domestic market is not sufficient. But it is important to note here that when dealing with the use of Nepal's immense water resources through bilateral, multilateral or regional cooperation, there is a doubt, suspicion, and mistrust among the countries of South Asian region (Dhungel, 2010).

## ***CHILIME HYDROPOWER COMPANY LTD. (CHPCL)***

Chilime Hydropower Company Limited (CHPCL), a subsidiary company of NEA with 51% equity ownership was established in 1996 with an objective of promoting the utilization of resources within the country for development of hydropower. As a first step towards its objective Chilime Hydropower plant (CHPP) located in Rasuwa district with installed capacity 22.1MW was built and commissioned on August 25, 2003 (8 Bhadra, 2060). The plant is now in the seventh year of commercial operation.

## VISION, MISSION & VALUES OF CHPCL

### Vision

"To be the largest public hydropower company in Nepal. "

### Mission

- To harness hydropower potential of the country for the benefit of the people at large by optimally utilizing the untapped resources and creating synergy with the private sector.
- To ensure attractive and sustainable long term return to our shareholders through prudent and sound investment.
- To create a competitive working environment with long term career prospects to our employees whereby they will nurture a culture to learn, grow and put their best effort to the growth of the company.
- To maximize the public participation and empower them to have better living, and
- To make the communities in which we live, work and serve, better places to be.

### Values

*Public Focus:*
We strive to maximize the involvement of public as shareholders ensuring them attractive and sustainable return.
*Management Excellence:*
We are committed to ensure management excellence through innovation and adoption of the best practices both in execution and operation of the projects to maximize the efficiency and quality of the service.
*Human Resource:*
We are committed to provide our employees opportunities to learn and grow to achieve their full potential.
*Corporate Governance:*
We believe in being accountable, conducting business ethically and transparently.
*Corporate Social Responsibility:*

- We are committed to take social initiatives for the development of local areas in particular and the nation in general.

### Share Capital Structure:

| | |
|---|---|
| Authorized Capital | 150 Crores |
| Issued Capital | 140 Crores |
| Paid up capital | 72.96 Crores |

**New project in process upto 2020 AD:**

- Upper Sanjen Hydropower Project – 14.6 MW
- Sanjen Hydropower Project – 42.5 MW
- Rasuwagadi Hydropower Project – 100 MW
- Middle Bhotekoshi Hydropower Project – 102 MW

**Total** **259.1 MW**

## Financial Position:

***TABLE : 1***

***NET PROFIT MARGIN of CHPCL***

Rs. In million

| Fiscal Year | Net Income | Sales | Net Profit Margin (in %) | Trend of Ratio | EPS % | Dividend payout Ratio in % |
|---|---|---|---|---|---|---|
| 2062/63 | 507.76 | 819.41 | 61.97 | 100.00 | 69.59 | 35 |
| 2063/64 | 667.48 | 903.54 | 73.87 | 119.22 | 91.49 | 30 |
| 2064/65 | 679.37 | 870.01 | 78.09 | 126.02 | 93.12 | 35 |
| 2065/66 | 735.36 | 883.45 | 83.24 | 134.33 | 100.79 | 45 |
| 2066/67 | 777.43 | 886.56 | 87.69 | 141.51 | 106.56 | 60 |

Source: Annual Report of CHPCL (2062/63 to 2066/67)

According to ***Table -1*** the financial position of CHPCL was in increasing trend. So, the trend of EPS & DPS was also in increasing trend.

Above ***Figure-1*** also represent the trend of EPS & DPS was in increasing level but, it indicated that CHPCL give more DPS in comparison of Net profit margin increasing ratio.

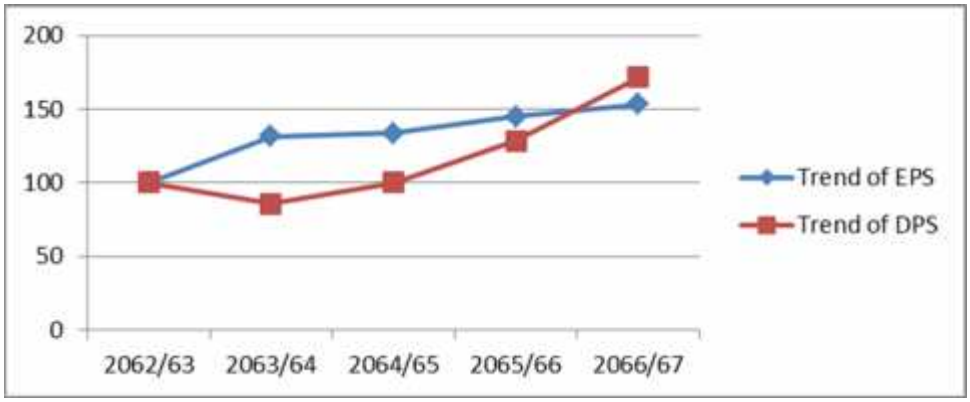



Fig 1: **Trend of EPS & DPS of CHPCL**

## BUTWAL POWER COMPANY LTD. (BPC)

Butwal Power Company (BPC) was established in 1966 by a visionary Norwegian engineer Mr. Odd Hoftun. Mr. Hoftun, who led the construction of Tinau Hydropower Plant, had a vision for educating young Nepal is in development of technical skills for harnessing the hydropower potential of Nepal's rivers to create opportunities for small businesses. He managed to raise support from his home country, and brought tons of equipment from Norway to Butwal in 1964.

BPC was established with an aim to enhance capacity development in the hydropower sector. BPC pioneered various concepts for developing self-competency in various facets of the hydropower industry like engineering, construction, operation, maintenance and manufacturing of hydroelectric equipment.

## Mission & Vision of BPC

### Vision

"To be a leading enterprise in Power Sector with excellence in providing innovative and quality products and services to meet the growing demand for efficient and clean energy."

### Mission

- Be a competitive hydropower developer and an electric utility
- Secure sustainable performance of our investments
- Be committed to protect the environment
- Practice corporate social responsibility by serving the communities where we do business
- Provide a safe, healthy and fulfilling work environment for our employees
- Maximize value for all stakeholders

### Values

- Customer focus – We seek to understand the customers' needs and strive to deliver the best as professionals.
- Transparent – We are transparent in our business and financial transactions.
- Proactive – We explore and look for solutions, opportunities, partnerships to improve our business.
- Team Work – We work together with mutual respect and trust to achieve results.

### Share Capital Structure:

| | |
|---|---|
| Authorized Capital | 800 Crores |
| Issued Capital | 169 Crores |
| Paid up capital | 92.30 Crores |

**Status of Projects/Joint venture & in process:**

- Nyadi Hydropower Project – 30 MW
- Kabeli-A Hydroelectric Project – 37.6 MW
- Andhikhola Upgrading Project – 9.4 MW
- Lower Manang Marshyangdi HPP – 93 MW
- Marshyangdi III HPP – 42 MW

**Total** **212 MW**

**Financial Position:**

***TABLE: 2***

***NET PROFIT MARGIN of BPC***

Rs. In million

| Fiscal Year | Net Income | Sales | Net Profit Margin (in %) | Trend of Ratio | EPS % | Dividend payout Ratio in % |
|---|---|---|---|---|---|---|
| 2062/63 | 288.42 | 358.42 | 80.47 | 100.00 | 34.37 | 30 |
| 2063/64 | 252.84 | 379.77 | 66.58 | 82.74 | 30.13 | 25 |
| 2064/65 | 353.88 | 421.69 | 83.92 | 104.29 | 42.18 | 30 |
| 2065/66 | 291.59 | 430.80 | 67.69 | 84.11 | 34.75 | 30 |
| 2066/67 | 224.23 | 453.43 | 49.45 | 61.45 | 24.29 | 30 |

Source : Annual Report of BPC, 2066/67

According to above ***Table-2*** the financial position of BPC was in fluctuated trend. So, the trend of DPS was also in fluctuated trend as per EPS.

***Figure-2*** also represents the trend of EPS & DPS of BPC which was in fluctuated. But there was similarity between the trends of EPS & DPS.

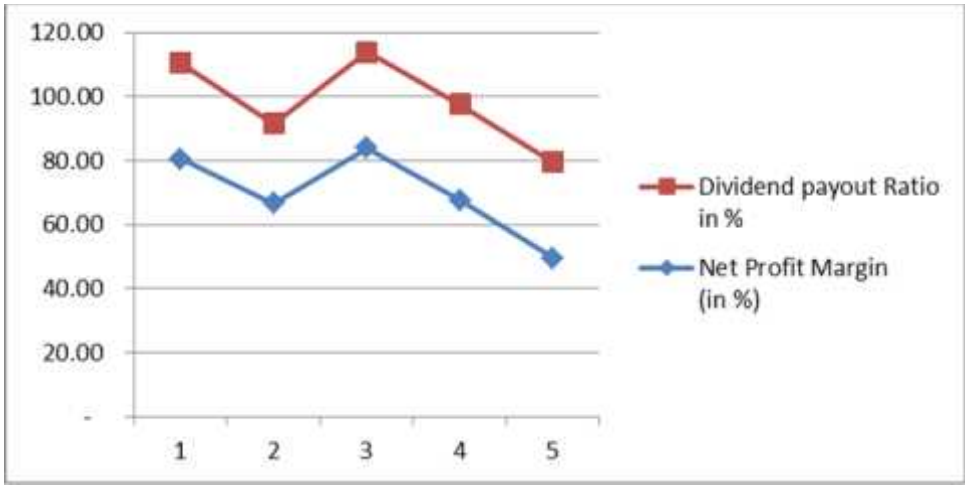



Fig 2: **Trend of EPS & DPS of BPC**

## 1.3 FOCUS OF THE STUDY

This study focused on need & practice of working capital management on Hydropower Company. Generating electricity & transmit to national grid and also distribute to customer are the main work or business of hydropower company. So, the researcher wants to search & focus on "Managing perspective on Working capital & policies are adopted for this." Similarly, this study focuses on the financial performance indicator with valuable Ratios. Also, in this study the researcher focus on the relationship between effective variable & compare them by using statistical tools. This study has done using the past five years, (F/Y-2062/63 to 2066/67 B.S.), Published data from related company.

- Focusing Sector = Hydropower company
- Focusing Company = CHPCL & BPC
- Focusing Study = Working Capital Management
- Focusing Period = F/Y-2062/62 to 2066/67 B.S.

## 1.4 STATEMENT OF PROBLEMS

The management of working capital is in itself is a decision area within the framework of the overall financial management. It is understandable that working capital should be neither too little nor too much; it must just be right and balanced. Too little of working capital create the problem of liquidity and hence the company suffers from technical insolvency. Technical insolvency of the company damages its long term vision. Similarly, too much of working capital impact the profitability of the company, as idle working capital earns nothing but only cost. Therefore, the management must be effective & efficient to manage its working capital.

Working capital is the Life-blood of every organization activities which gives much more energy to daily operating life of it. The success and failure of any business organization is heavily depending upon its efficiency in its working capital management. It is the process of planning and controlling the level of current assets of the company as well as financing these assets. Specially, it is important for financial managers to decide what quantity of cash, other liquid assets, account receivables, and inventories should be maintained.

"The Working capital management is concerned with the problems that arise in attempting to manage the current assets, current liabilities and, interrelationship between them (Smith, 1994:5).

This research is basically to find out the problem on managing of working capital on CHPCL & BPC respectively with the following related questions:

1) What is the structure of W/C of CHPCL & BPC & is it appropriate?
2) What are the situations of composition of working capital in CHPCL & BPC?
3) Is there any relation between variables on composition of working capital in CHPCL & BPC?

4) Is there sound liquidity position in CHPCL & BPC?
5) What is the efficiency of working capital in CHPCL & BPC?
6) What is the impact of working capital management in profitability in CHPCL & BPC?
7) Is there formal policies and practice for managing working capital in CHPCL & BPC?

## 1.5 OBJECTIVE OF THE STUDY

The basic objective of this study was to identify the existing situations & to analyze the relationship between different variables of working capital for the past five year's period (2062/63-2066/67) of CHPCL & BPC. Therefore, to support to basic objective, the study had also adopted the following specific objectives:

1. To determine the structure of W/C in CHPCL & BPC.
2. To assess the composition of working capital in CHPCL & BPC.
3. To access the relationship between variables on composition of working capital in CHPCL & BPC.
4. To assess the liquidity position of CHPCL & BPC.
5. To measure the profitability position of CHPCL & BPC.
6. To access the relationship between liquidity & profitability in CHPCL & BPC?
7. To assess the efficiency of working capital in CHPCL & BPC.
8. To assess the policies and practice for managing working capital in CHPCL & BPC.

## 1.6 HYPOTHESIS

Hypothesis is usually considered as the principal instrument in research. Its main function is to suggest new experiments and observations.

To access the relationship between variables on composition of working capital & profitability position of CHPCL & BPC, the researcher has formulated the following hypothesis and attempted to find statistical evidences to support the hypotheses.

***1. Hypothesis $Ho_1$:***

There is no significant relation between Current Assets & Total Assets of CHPCL & BPC.

***2. Hypothesis $Ho_2$:***

There is no significant relation between Current Assets & Fixed Assets of CHPCL & BPC.

***3. Hypothesis $Ho_3$:***

There is no significant relation between Cash & Bank Balance & Current Assets CHPCL & BPC.

***4. Hypothesis $Ho_4$:***

There is no significant relation between Cash & Bank Balance & Total Assets CHPCL & BPC.

***5. Hypothesis $Ho_5$:***

There is no significant relation between Receivable & Current Assets CHPCL & BPC.

***6. Hypothesis $Ho_6$:***

There is no significant relation between Receivable & Total Assets CHPCL & BPC.

***7. Hypothesis $Ho_7$:***

There is no significant relation between Inventory & Current Assets CHPCL & BPC.

***8. Hypothesis $Ho_8$:***

There is no significant relation between Inventory & Total Assets CHPCL & BPC.

***9. Hypothesis $Ho_9$:***

There is no significant relation between Net profit & Gross working capital of CHPCL & BPC.

***10. Hypothesis $Ho_{10}$:***

There is no significant relation between Gross profit & Current ratio of CHPCL & BPC.

***11. Hypothesis $Ho_{11}$:***

There is no significant relation between Net profit & Current ratio of CHPCL & BPC.

***12. Hypothesis $Ho_{12}$:***

There is no significant relation between Net profit to total assets & Quick ratio of CHPCL & BPC.

*13. Hypothesis $Ho_{13}$:*

There is no significant relation between Return on Shareholder's equity & Quick ratio of CHPCL & BPC.

## 1.7 SIGNIFICANCE OF THE STUDY

Firstly, this study is most important for the researcher to get practical knowledge on managing of working capital and gives more tips to the related managers, employee, and stockholder & to look financial performance regarding working capital management.

This study is done for the partial fulfillment of Master Degree in management. Last but not the least; the study will be helpful in future to the student of management in the course of preparation and reviewing of their research work.

## 1.8 ASSUMPTION & LIMITATIONS OF THE STUDY

Every research has its own boundary. In the same way this research paper has also some boundaries, which cannot be ignored. These boundaries are called as limitations of this study. The research had some limitations. Basically,

1) This research has done for two hydropower companies out of 22 on sampling basis which was listed on NEA annual report 2066/67. So, it might not be representative the overall hydropower companies or projects.
2) This study is fully based on five year (FY- 2060/61 to2066/67) secondary data of CHPCL & BPC.
3) The obtained information and explanations used on study are assumed to be true of the published financial data of both companies.
4) This study covers only working capital management, so it is impossible to cover overall position of these companies.
5) Limited tools and techniques are used for the study.
6) Effect of monetary inflation is not considered.
7) Lack of information center, the researcher unable to give proper information.

Among above limitations, the researcher tries to give best performance on related subject.

## 1.9 ORGANIZATION OF THE STUDY

The study has been organized into five chapters, each devoted to some aspects of the study of working capital management for both companies. The titles of each of these chapters are as follows.

**Chapter- I: Introduction**

The first chapter deals with background of the study, introduction to selected hydropower company with its basic information, the focus of the study, statement of the problem, objectives of the study, limitations of the study and organization of the study.

**Chapter: II Review of Literature**

It deals with theoretical aspect of working capital management and review of selected journals, articles & past research on working capital management.

**Chapter: III Research Methodology**

The chapter describes the research methodology. This chapter deals with research design, population and sample, sources of data, data collection and tools used to analysis of secondary data.

**Chapter: IV Presentation & Analysis of Data**

This chapter deals with the presentation and major finding of the study on working capital management.

**Chapter: V Summary, Conclusions & Recommendations**

This chapter deals with summary, conclusion & recommendations drawn by researcher.

References and appendices have also been included in the last part of the study.

## 1.10 TERMS USED IN THIS STUDY

In order to clarify the confusion and misunderstanding the key term that have been used in the study are defined as follows.

- **Current Assets:** Current assets are assets convertible into cash within an accounting year or within the operation cycle, whichever is greater. Operating cycle is always involved in the conversion of sales into cash. Current assets include cash, inventories, accounts receivable, notes and bills receivable, debtors and marketable securities.
- **Current Liabilities:** Current liabilities means that liabilities which were payable within the next accounting year or operating cycle. It includes creditors, account payable; notes and bills payable, temporary loans and provisions.
- **Sales:** Sales included only sales of electricity.
- **Total Assets:** The figure of total assets published by related company.
- **Inventories:** In the case of Hydropower Company, inventory holed for stationary & other necessary items which fulfill operational works. The saleable items i.e. electricity was not stored.

# CHAPTER - II

REVIEW OF LITERATURE

The study of Working capital management behavior occupies on important palace in financial management. So, the main objective of this chapter is to introduce to working capital management & review some related journals, articles & research paper on the related area to make effective study.

## 2.1 BACKGROUND FOR WORKING CAPITAL MANAGEMENT

Working capital is a cost rolling nerve center of every business organization because no business can run smoothly without the proper control upon it. Thus it plays the crucial in the success and failure of the organization. The management of the funds of business can be described as financial management. Generally financial management decision into the management of as-sets (investments) and liabilities (sources of financing) in (1) the long term and (2) the short term. In this study, we discuss about short-term financial management of current assets and current liabilities of the particular company. The value of the company or firm cannot be maximized in the long run unless it survives the short run. Firms fail must often because they unable to meet their working capital need; consequently, sound working capital management is requisite for firm's survival (Weston, J.F. and Brigham, 1996:332).

Working capital is needed for day-to-day operation, of the business, so it can be considered as the life-blood for any business. The management of working capital has a definitive effect on the profitability and the contributed existence of the business great importance has been attached to management of fixed assets but working capital management has not been given the much importance as it deserves inadequate planning of working capital requirements can more speedily

effectively bring as otherwise be paid to the management working capital. Efficiently and the optimum utilization of even the fixed assets to which a great importance is given depends upon the availability of adequate working capital Now a day the efficiency management of working capital has acquired a greater in view of the tight credit policy followed by the reserve bank of India is as a result of the acceptance of recommendation made by the Tandon and Chore committees (Jain S.P. and Narang, 1991:171).

The goal of working capital management is to manage the firm assets and current liabilities in such a way that a satisfactory maintained. So if the firm cannot maintain a satisfactory level of capital, it is likely to become insolvent. The current assets should be large enough to cover its current liabilities, in order to ensure a reasonable margin of safety (Jain and Khan, 1982:603).

Professor W. Brigham has given some theoretical insights in working capital management after their various research studies on it. The; explain in the beginning the importance of working capital, concept of working capital management, financing of working capital management, they use of short term versus long-term debt, relationship of current asset fixed assets.

Hence the success and failure of any enterprises depends on its working capital policy & practice.

## 2.2 FUNDAMENTAL CONCEPT WORKING CAPITAL MANAGEMENT

Conceptually the term "Working capital" deals with the nature of current assets and current liabilities. "Current assets in the firm of cash, receivable and inventories are needed to carry on the operating activities of the firm. Working capital is the amount of fund used to finance these current assets. Working capital keeps revolving in different forms of current assets (Paudel & etal, 2067:370).

## Concept of working capital

There are mainly two concept of working capital. Our study only focuses the working capital management.

a. Gross concepts of working capital
b. Net concepts of working capital

**a. Gross concepts of working capital**

The gross working capital is the capital invested in total current assets such as cash, marketable securities, receivables and inventories. The concept of gross working capital is important to decide the amount needed for each items of current assets. However, the gross working capital concept does not mention how they are financed. It also does not indicate the firm's liquidity correctly because it does not compare current assets with current liabilities of the firm.

***Some other statements regarding to the gross concept on W/C:***

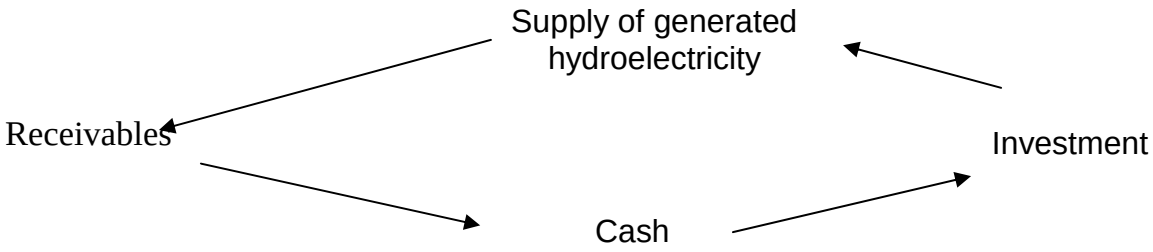
"In a simple term, gross concepts of working capital mean investment in current asset. In other words, gross concepts of working capital are the total amount of available for financing of current assets. Thus the gross concept of working capital is the capital invested in total current assets of the enterprises (Sharma & Gupta, 1986:604).

According to Pradhan, R.S. and Koirala ,K.D. expressed their views about gross concepts of working capital as "lf all expenses needed to run day-to-day operation of gross concepts of business, such as amount to be invested in the form of cash, finished goods, receivables etc, are put together, it is called working capital. This working capital and total current asset are synonymous together it is called working capital. Gross working capital expressed as:

**Gross Working Capital = Total Current Assets**

**Gross Working capital cycle under Hydropower company**

***Figure*: 2.1**




**Current assets include:**

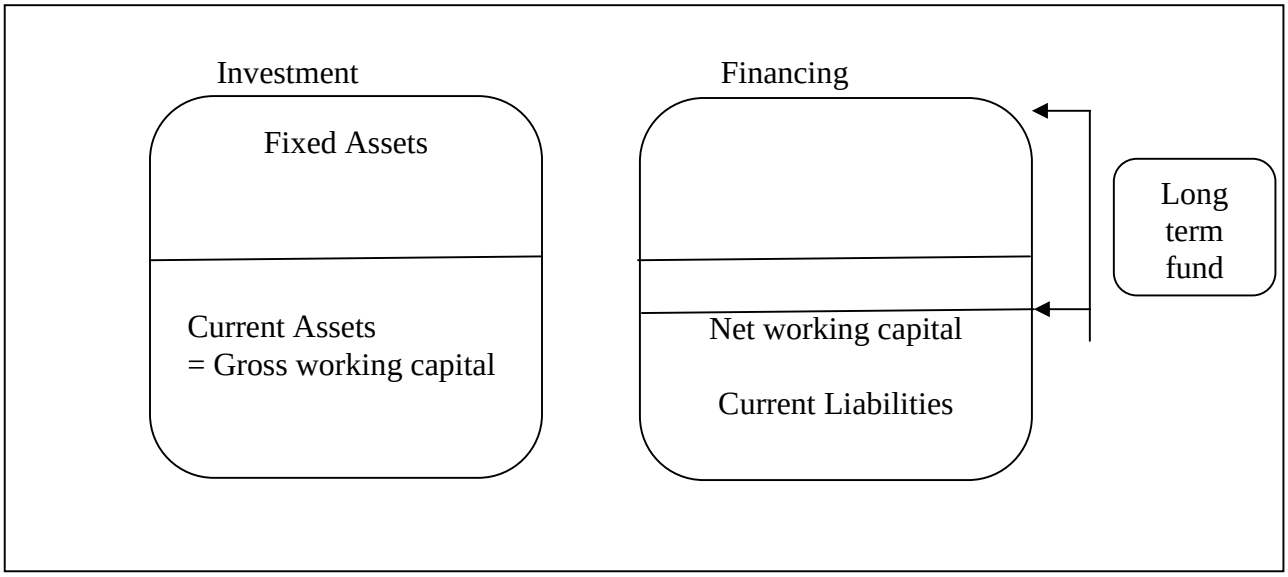
a. Cash in hand and bank balance:
b. Bills receivables
c. Sundry debtors
d. Short term investment and advance
e. Inventories
f. Prepaid expenses
g. Accrued income
h. Marketable securities

**b. Net concept of working capital**

"Net working capital is the excess of current assets over current liabilities. In other words, it is that of current assets which is financed from long-term funds. It can be expressed as:

**Fig 2.2 : Concept of Networking capital**

**Net working capital = Current assets – Current liabilities**




Net working capital can be defined as the excess of long-term fund over fixed assets. It can be expressed in the following equation:

**Net working capital = Long-term funds – Fixed assets**

The networking capital concept also tells how the current assets are financed. The Net working capital can be positive or negative. When current assets exceed current liabilities, the firm has positive networking capital. A positive networking implies that portion of the firm's current assets is financed with long-term funds. When current liabilities exceed current assets the firm has negative working capital. A negative working capital implies that portion of the firm's fixed assets, in addition to the current assets, is financed with current liabilities. Higher networking capital indicates better liquidity; it reduces the risk of default. However, it also lowers the probability as the firm uses more expensive long-term funds to finance certain portion of current assets (Paudel & etal, 2067:370-371).

***Some other statements regarding to the net concept on W/C:***

Net working capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities a negative net working capital occurs when current liabilities are in excess of current assets (Pandey:370).

From the view point of **Van Horne** "working capital is the total component of receivable, liquidity, inventory, and current liabilities. It has grouped them according to the way they affect valuation and also described the different methods for effective management of cash and marketable securities and valuation models for balancing cash and marketable securities. For the management of receivable different credit and collection policies have been described and various principles of inventory have been examined for inventory management and control (Van Horne and Mchowiwzh: 204).

**Current liabilities include:**

I. Bills payables
II. Sundry creditors or account payable
III. Out standing expenses
IV. Short term loans
V. Dividend payable
VI. Bank Overdraft
VII. Provision for taxation
VIII. Provision for loss in short term investment.

## 2.3 TYPES OF WORKING CAPITAL

On the basis of time concept of working capital can be divided into two parts. They are as follows:

I. Permanent or fixed working capital
II. Variable or temporary or fluctuating working capital

**a. Permanent or fixed working capital**

Permanent working capital is the minimum amount of gross working capital which is always maintained in spite of the increase or decrease in the sales during the year. The permanent working capital comprises of the minimum cash balance, minimum inventory level, minimum receivable, etc. If a firm does not face a seasonal cycle then it will have only a permanent working capital requirement. Knowledge of permanent working is important for the financial manager to decide sources for financing permanent current assets. Example: Salary & allowances, PF, other permanent administration etc.

**b. Variable or temporary working capital**

Variable working capital is the amount of gross working capital that excess the amount of permanent working capital at any time during the year. It is also important for financial manager to decide source for financing seasonal current assets. With seasonal needs the firm must also make a decision as to how they wish to meet the short –term nature of their seasonal cash demands. The variable working capital is the result of the periodic fluctuations of the gross working capital. Examples: wages, repair & maintenance, royalty, temporary administration & operational exp. etc.

## 2.4 FACTORS AFFECTING WORKING CAPITAL

There are some factors that affect working capital requirement of a firm. Although the degree of effect of these factors varies from one line to another, the major factors that affect the working capital are as follow:

- Sales volume
- working capital policies
- Credit policy of the firm
- Technology

- Nature & size of firm
- Cost of inputs
- Access to short-term credit
- Cash conversion cycle
- Predictability of cash flow
- Change in policy of GOVn.

## 2.5 IMPORTANCE & NEED OF WORKING CAPITAL MANAGEMENT

Managing the working capital is a day to day activity that ensures the firms has sufficient resources to continue its operations and avoid costly interruptions. Both excessive and insufficient level of working capital is not desirable from the view point of shareholders' wealth maximization goal. It is because excessive working capital is not as productive as fixed capital, and with insufficient working capital the firm faces problem to satisfy the current obligations (Paudel & etal, 2067:376).

***Some other statements regarding the importance & need of W/C:***

No business can run successful without an adequate amount of working capital. It is an important aspect of financial management. It is important due to.

1. Adequacy of working capital creates a feeling of securities and Confidence.
2. Adequacy of working capital is a must for maintain solvency and continuing production.
3. Creation of sound goodwill.
4. Easy loan from bank.
5. Easy availability of cash discount.
6. General rise management moral.
7. Quick and steady return to the investor
8. Facility of off-season purchasing.

9. Regular supplies off-season purchasing.
10. Utilization of opportunities.

From the view of P.K Kuimany, “Working capital may be regarded as the life-brood of a business. Its effective provision can do much to ensure the success of business while its inefficient management can lead not only loss of profit but also ultimate do fall of what otherwise might be considered as a promising concern. It has been rightly made of the long-term planning of capital project. Out the cost includes due to inadequate planning in the use of working capital is immeasurable (P.K. Kulmany, 1993:385).

## 2.6 WORKING CAPITAL POLICY

Working capital policy involves two key issues: current assets investment policy and current assets financing policy. Deciding on how much current assets to be maintained and how to finance them are crucial issues of working capital management because the level of CA and the ways of financing them have direct impact on the firm's profitability, liquidity and risk. A firm's working capital policy may be classified as (Paudel & etal, 2067:384-386).

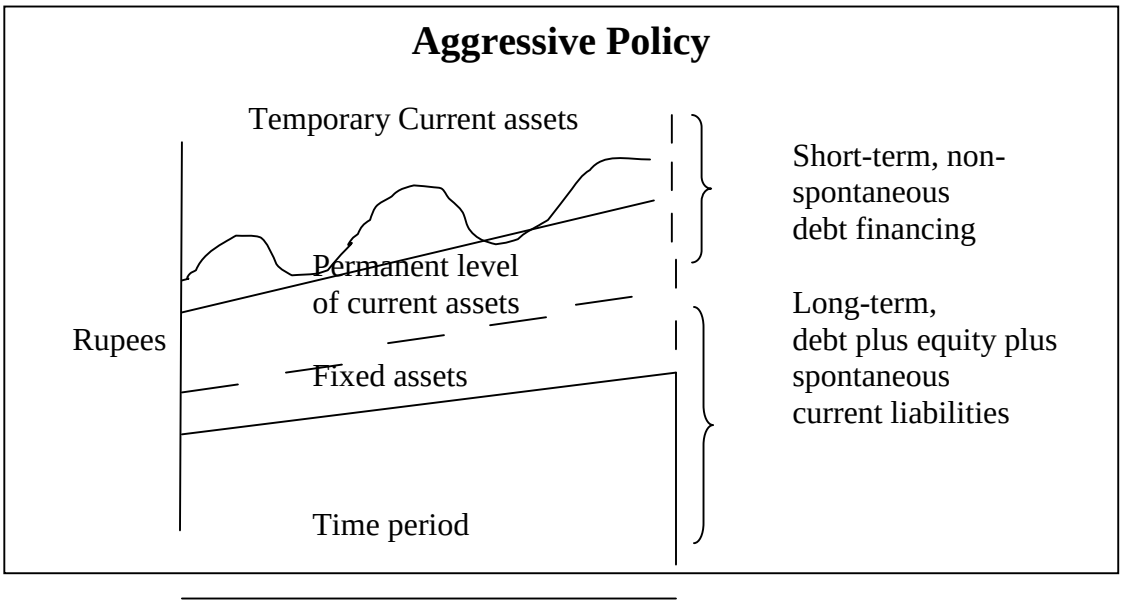
a) Aggressive Policy
b) Conservative Policy
c) Moderate Policy

**a. Aggressive Policy**

Aggressive policy maintains lower ratio of current assets to total sales to minimize investment in current assets. Therefore, it is called tight policy or 'lean and mean' policy or restricted current assets investment policy also. The aggressive policy finances a firm's current assets need, and possibly some of its permanent needs, with short-term funds, including trade credit, bank lines of credit or commercial

paper to minimize cost of investment in current asset. This approach seeks to increase profit by reducing investment in current assets and by using less expensive short-term financing sources. But this approach increases risk since the firm operates with minimum net working capital. Some extremely aggressive firms may use short-term funds for financing some portion of fixed assets too.

**Fig. 2.3 : Aggressive policy**



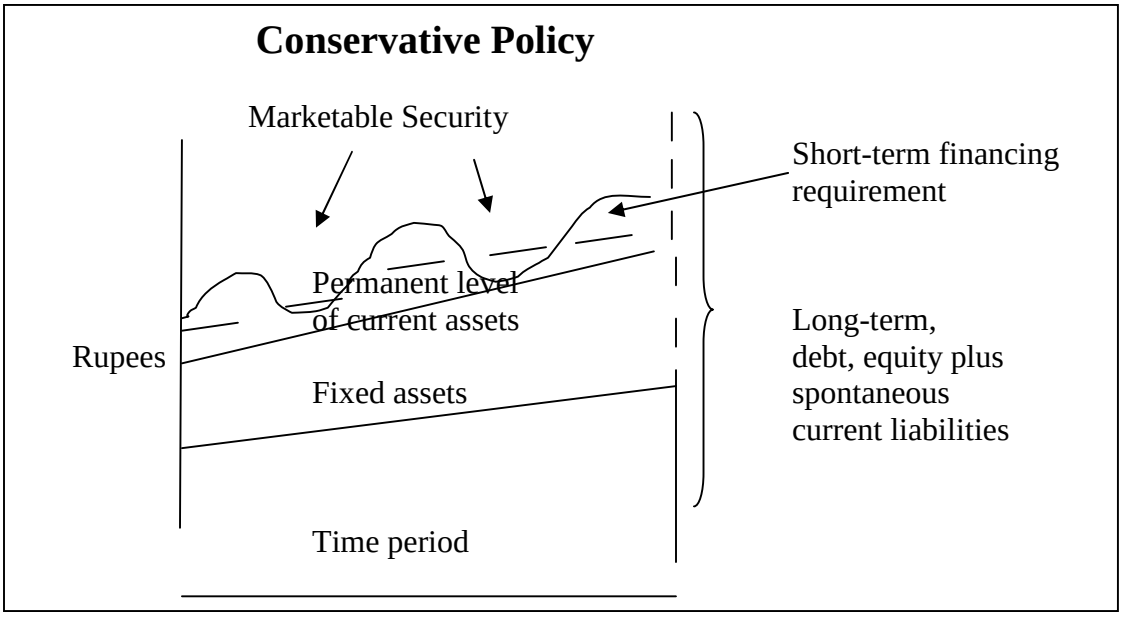

Use of short term funds is cheaper than the long term funds. It tries to shorten cash conversion cycle in order to reduce the amount of working capital requirement. This policy reduces the holding cost of inventory. In adverse financial condition, such firms may not be able to pay short-term liabilities in time. Besides, use of short-term funds exposes the firm to the risk of the increase in interest rates and uncertainty of renewal.

**b. Conservative Policy**

Ratio of CA to sales is high in conservative policy. It is known as flexible policy of relaxed current investment policy or 'fat cat' policy. The conservative policy

finances most part of expected fund requirements with long-term funds, while short-term funds are reserved for use in the event of emergency.

**Fig. 2.4 : Conservative policy**

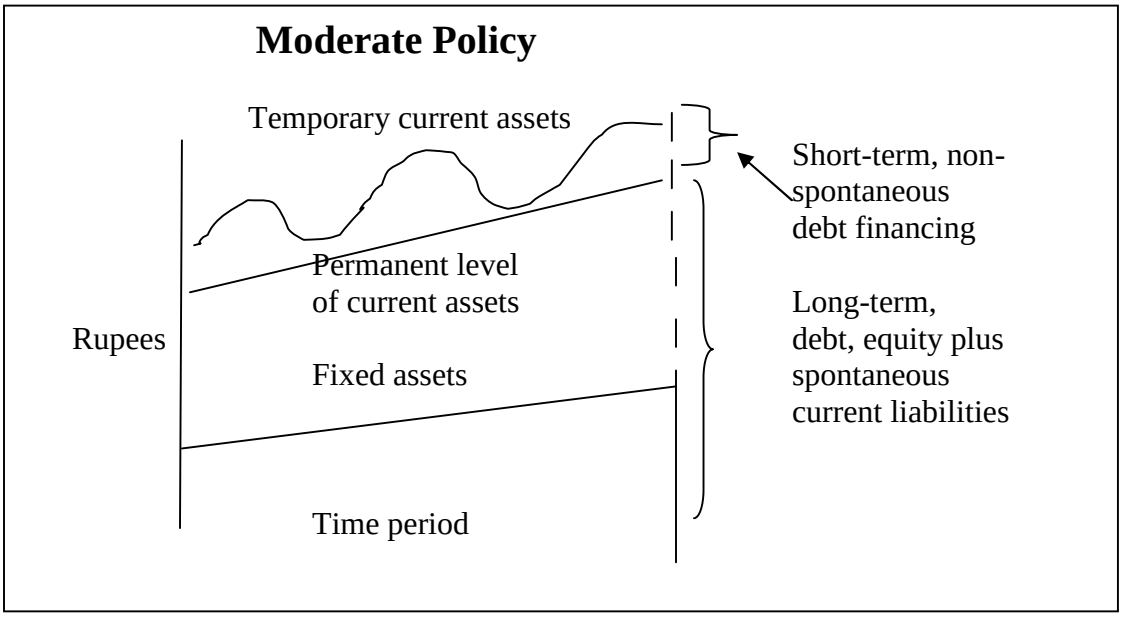



This strategy results in relatively lower profits, since the firm uses more of the expensive long-term financing and may pay interest on unneeded funds. The conservative approach has less risk because of the level of net working capital. Under this policy a firm reserves short-term borrowing power for meeting unexpected demand for fund.

**c. Moderate Policy**

Moderate policy lies between aggressive policy and conservative policy. It is also known as maturity matching or self-liquidating approach because this policy tries to match assets and liabilities maturities. This policy finances all fixed assets and permanent current assets with the long-term funds and seasonal current assets with short-term funds.

**Fig. 2.5 : Moderate policy**




The ratio of current assets to sales is neither too high nor too low under this policy. There is a problem in exact maturity matching under this policy because the lives of the assets are not accurately predictable. On the other hand, firms must use common equity that has no maturity.

The following table summarized the profitability, liquidity & risk under different working capital policies:

| Policies | Profitability | Liquidity | Risk |
|---|---|---|---|
| **Aggressive** | High | Low | High |
| **Conservative** | Low | High | Low |
| **Moderate** | Moderate | Moderate | Moderate |

## 2.7 WORKING CAPITAL CASH FLOW CYCLE

Working capital cash flow cycle is the patterns of cash inflow and cash outflow due to frequent changes in the inventories, account receivables and account payables. The financial manager analysis the working capital cash flow cycle in order to manage the cash inflows and cash outflows due to the changes in the current assets and current liabilities. The financial manager calculates the cash conversion cycle in order to estimate how much working capital is required. Cash conversion cycle is the length of time between the firm's payment for its purchase and labor and its own collection of payment from customers. A cash conversion cycle refers to the period between the payment to its creditors and receipts from suppliers. So, it can be calculated by following equation:

**CCC =ICP+RCP-PDP**

Where,

CCC = Cash conversion cycle

ICP = Inventory conversion period

RCP = Receivable conversion period

PCP = Payable deferral period

**ICP, RCP and PDP can be calculated by using following formula**

$$ICP = \frac{360}{ITR}$$

ITR= Inventory turnover ratio ie. Sales/Inventory

RCP= Receivable*360 days /sales

PDP = Payable / Daily purchase

Payable deferred period is the average length of times between the purchase of raw materials, labor and payment of cash for them.

## 2.8 TRANSITION AFFECTING WORKING CAPITAL

Following are the main points involved in working capital.

I. An increase in current assets causes an increase in working capital
II. A decrease in current assets causes a decrease in working capital.
III. An increase in current liabilities causes a decrease in working capital
IV. A decrease in current liabilities causes an increase in working capital

## 2.9 TRANSACTION NOT AFFECTING WORKING CAPITAL

Following are the main points that involved in transaction not affecting working capital

I. Similar increase in both current asset and current liabilities
II. A decrease in current assets and decrease in current liabilities by the same amount do not affect the working capital (Khan & Jain, 1971:210).

## 2.10 RECEIVABLES MANAGEMENT

It is the key factor of every firm that maintains its working capital cycle. Account receivables, trade receivables, customer receivables, sundry debtors, trade debtors, trade acceptance, book debs, bill receivables etc. The advance to salesman, goods transferred to branches, goods sent on consignment and advance against suppliers are not included on receivable.

The credit sales are made either securing by legal documents or on open account. Under the former method, the bills, handiest are taken from the debtors. Such amounts are classified under ‘notes receivables’ or ‘bill receivables’ for the collection of debts. The court of law such as instruments meets the legal requirement. Under the latter method, a formal note is not needed to recognize the debt. Such credit sales are called “Sales on open account”. The documents that show such debts are purchase order from customer, invoices and billing statements. The open account reduces the paper work for credit sales (Dangol, 2050:277).

Weston and Brigham said to this connection, "Since the typical manufacturing firm also about twenty percent of its assets invested in receivable, the management of those assets is obviously important. The level of investment, in receivable is depended on the firm’s credit policy, which considered of four variables."

**Basically receivable management is important for:**

i. To expand sales
ii. To maximize Profit and
iii. To meet competition

***Account receivable can be calculated by this:***

$$\text{Receivable turnover Ratio} = \frac{Annual\ Credit\ Sales}{Average Accounts\ \text{Re}ceivables}$$

$$\text{Days Sales Outstanding (DSO)} = \frac{\text{Re}\,ceivable}{Average\ Sales\ Perday}$$

## 2.11 INVENTORY MANAGEMENT

"The inventory management is assumed to be required to maintain an adequate supply to correct material at the lowest total cost. The responsibility of determining the material requirement implied by the marketing forecasting and liaising with the purchasing department for their acquisition, receiving and storing the material safely and good condition for its subsequent issue (Muhlemann & etal, 1996:364).

**Under the Inventory management these cost are included**

a. Carrying / Holding cost
b. Ordering cost
c. Stock – out cost

**Some techniques are involved to manage Inventory**

a. Economic order quantity (EOQ)
b. Reorder level
c. Safety stock
d. Maximum level
e. Minimum level
f. Danger level
g. Perpetual inventory system
h. Stock control through ABC analysis
i. Inventory reports

## 2.12 REVIEW OF JOURNALS/ARTICLES

This part is mainly focused on the review of journals /articles which was written by different management experts on working capital management.

***Professor Dr. Khagendra Acharya,*** who was studied on working capital management of manufacturing public enterprises, has described two major problems, operational problems and organizational.

***Operational Problems:***

- Increase of current liabilities than current assets, not allowing the current ratio 2: 1 and it Slows turnover of inventory.
- Similarly, Change in working capital in relation to fixed Assets
- Thin transpiration of capital employed to sales absent of apathetic management information system, Break-even analysis, funds flow analysis and ratio analyses are either undone or ineffective for performance evaluation.

He states that most of the enterprise's management has been misunderstanding as the managed the money rather than its efficient utilization. Thus, existing problems in the finance are mostly directed toward the management of working capital rather than in any area. Finally, monitoring of the proper functioning of working capital management has never been considered a management job.

***Organizational Problems:***

**In the second part,** he has listed the organization problems, in the public enterprises. In most of the public enterprises, there is lack of regular internal and external audit system as well as evaluation of financial result. Similarly very few public enterprises have been able to present their capital requirement, functioning of finance development is not satisfactory level and some public enterprises has

been facing the underutilization of capacity. To make an efficient use of funds for minimizing the risk of loss to attain profit objective, he has suggested that manufacturing concern finance staff must be acquainted with the modern scientific tools for the presentation and analysis of the data. Public enterprises should avoid the system of crises decision, which has prevailed frequently in their operation, avoid finite hedge of the assets and lastly the has suggested optimizing its level of investment at a point time neither over or under investment in working capital is desired by the management of an enterprises because both of these situation will erode the efficiency of the concern.

***Mr. Radheshyam Pradhan's***

In his book "Management of working capital", he maintained following finding after studying selected manufacturing public enterprises.

- Most of the selected enterprises have been activating a trade of between risk and return thereby following neither an aggressive nor a conservative approach.
- Poor liquidity position was found on most of the enterprises. This poor liquidity position has been noticed as the enterprises have either negative cash flow or negative earning before tax or they have excessive net current debts which cannot be paid within a year.
- Nepalese manufacturing public enterprises have, on average, half of their total assets in the form of current assets. Among different components of current assets, inventory's share was largest and similarly followed by receivable & cash in most of the selected enterprises.
- The study was concerned with interrelationship that exists between managing current assets & current liabilities. The study manages to focus on net working capital concept. The study has employed ratio analysis, discriminate analysis & econometric model for its analysis.

## 2.13 REVIEW OF RELATED THESIS

Regarding the working capital management, here is presenting some research finding which was covered by different persons on their research paper.

**Mr. Dilli Raj Sharma** had studied comparative study on "Working capital Management practice in Nepalese Enterprises" during his fulfillment of master of Philosophy in management in 2007(unpublished). He has taken sampling of 20 public manufacturing enterprises of Nepal for the period of 1996-2005. He used mean, average ranking, correlation, regression, & chi-square test as statistical tools & also used financial tools to measure different ratio.

***Some major findings:***

- On an average, selected enterprises have invested 5% of total assets in the form of cash.
- The size of receivable has increased in the majority of selected EP.
- Selected EP had invested 17% of their total assets in the form of inventories.
- It was founded that only 6 EP have their cash to current ratio was 50 percent or more than it.
- Only two company's receivable ratio is more than 50 percent.
- Total six companies' inventory to current ratio was more than 50 percent & other have less than 50 percent.
- The ratio of turnover was varies widely from one EP to another.
- Credit collection policy of Nepalese EP was not satisfactory.
- Quick assets were insufficient to cover the current liquidity most of the EP had current ratio of less than 2:1.
- There was negative relation between sales & profit.
- There was positive significance between liquidity & profit.

**Mr. Hari Prasad Pokhrel,** who was conducted a case study of Bottlers Nepal Ltd. on "Working capital Management practice in Nepal" during his fulfillment of master degree on management in 2005 (unpublished). His research thesis was based on secondary data which was published by Bottlers Nepal. He also used of mean, average, correlation, regression, & trend line as statistical tools to find out relationship between two variables & financial ratio to performance evaluation.

***Some major recommendations:***

- Optimize liquidity position up to 2:1 ratio.
- Give more concentration on collection of outstanding bills.
- Applying cash management techniques.
- Optimize the level of inventory.
- A large volume of cash is quite useless which is higher than actual requirement. Thus, the corporation should estimate how much cash is required for immediate use and entire amount should be invest in marketable security.

Like this way, ***Mrs. Grishma Regmi*** had studied the comparative study between Bottlers Company & Nepal Lever Company as "A comparative study on working capital management" with five year's published data (2060/61 to 2064/65) during her fulfillment of master degree on management in 2009 (unpublished). She also used of mean, average, correlation, regression, & trend line as statistical tools to find out relationship between two variables & financial ratio for performance evaluation.

***Some major findings:***

- Both companies were neglecting the policy of working capital management.
- They have absence of sources of financing, financial position without long run of current assets & they have not predetermine of their working capital needs which indicates that there is a high variability of working

capital and have lower liquidity position.

- During the study period the profitability, liquidity and turnover ratio of both the companies are not satisfactory.

***Some major recommendations:***

- They should give more attention to manage their inventory level.
- The firm should try to maintain the considerable liquidity position as per working capital policy.
- Both companies should try to manage its credit policy effectively.

In the same way, ***Miss Rita Sharma*** had presented her research on " A study on working capital Management of selected manufacturing companies in NEPSE" with five year's published data (2002 to 2006 AD) of four company. She was submitted the research paper during her fulfillment of master degree on management in 2008 (unpublished). She also used of statistical tools namely mean, average, SD, correlation & regression analysis to measure the relationship between the selected variables & financial ratio for performance evaluation.

***Some major findings:***

- The quick ratio of all companies in below the standard of 1:1.
- There is no consistency in the company average of current assets to total assets.
- The ratio of cash to current assets widely varied among the manufacturing companies during the study period

***Some major recommendations:***

- The selected company must be compulsory formulation of working capital policy and apply.
- The manufacturing companies have deficit cash balance so, they should

estimate the requirement of cash immediately. If the cash appears more than requirement the company should invest such idle fund in marketable securities.

- To make effective management, they should adopt the definite credit and collection policies, which help to operate business with lower level of working capital.
- The management must give attention towards the effective inventory management by minimize the wastage, good store keeping system, better material handling system and timely inspection system.
- Control and reduce investment in inventory. The risk in the inventories can be controlled by coordinating between schedule of raw materials requirements and productions with consumer demand.
- Control overhead and increase awareness of the need for effective assets management

***Miss Binita Koirala*** had conducted her research paper on "Working capital Management of Dabur Nepal Privet Ltd" with Ten year's published secondary data (1992/93 to 2001/02 AD). She was submitted the research paper during her fulfillment of master degree on management in 2003 (unpublished). She also used of statistical tools namely mean, Standard Deviation, correlation & regression analysis to measure the relationship between the selected variables & financial ratio for performance evaluation.

***Some major findings:***

- Current ratio and quick was not up to the rule.
- CCR was in fluctuated trend.
- There was negative relation on CAT. ICA & DCA and also in fluctuated trend.

***Some major recommendations:***

- The company should try to improve their liquidity position.
- It should be make proper planning to decrease the liabilities or increase CA.
- It was suggested to improvements in the credit terms offered by suppliers.
- It should make proper provision for emergency for liquidity position.
- It should maintain proper balance of inventories which must commensurate with the current assets and sales.
- For the purpose of speculation motive, it may hold the marketable security.

# CHAPTER - III

## RESEARCH METHODOLOGY

### 3.1 INTRODUCTION

Research is to search again, to take another, more careful look, to find out more. We take another look because something may be wrong with what we already known (Selltiz et al.,1976:2). Research methodology is another but must important aspect of the thesis writing. Research methodology is a systematic and scientific method or techniques that are used in handling a problem by the researcher. In other words, research methodology provides the various tools and techniques as regard to the problem and also provides the various instructions as regard to the methods and process associated with over all study. Research methodology is very helpful in identifying the research problems. In fact, research is an art of scientific investigation.

During each research work, to accomplish the objectives effectively specified methods and process should be followed which is called research methodology. According to F.N Kerliner, "Research methodology is vital and absolutely indispensable part of social scientific and educational research. Without research methodology, modern social science and educational research would still be in the Age."

Research compromise defining redefining problems, formulating, hypothesis or suggested solutions, collecting, organizing and evaluating data, making deduction and reaching conclusion and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis (Kothari,1994:1).

From above definition, it can be said that research is the scientific and systematic process; it includes all types of investigation requiring solution to the problems. The scientific and systematic process of research involves activities of identifying problems, collecting facts and information tabulating and recording the data, setting hypothesis analyzing the facts and reaching certain conclusion with a view of findings answer of the problems.

Thus, methodology is a description of the procedures of inquiry in particular field. This chapter highlights the methods and procedures that are applied during the research period & also define to analysis technique of the collected data.

## 3.2 RESEARCH DESIGN

Research design is a systematic planning, structure and strategy for conducting a particular research work. It provides the framework of the study. To achieve the objectives, the study has collected, evaluated, verified and synthesized past financial information systematically and objectively to reach some conclusion. The study has also attempted to explore certain facts about the practice on working capital management under two hydropower companies namely Chilime Hydropower Company Ltd. & Butwal Power Company Ltd.

**The research design generally asks the following question:**

- What approach should be taken?
- What method will be used in the study? &
- What strategy will be most preferable?

So, the researcher followed explanative & analytical method on the basis of historical data for the period of five year (2062/63 to 2066/67 BS) because this research was done on past performance. This research has conducted by collection of information from secondary sources, tabulated that and analyzed by using

various financial ratio regarding working capital, statistical tools (Mean, Standard deviation, Coefficient of variance, correlation coefficient) & measure the statistical evidence between variables to assure the significance of relation.

## 3.3 NATURE & SOURCES OF DATA

In general, the sources of data can be classified into primary and secondary form. The data used in this study are basically secondary in nature but other information has been collected through personal meeting with the key person. The secondary data have been collected from Annual Report which was published by related company. And further information has collected through official websites of these companies. All the collected data and information have been properly arranged, tabulated and calculated to fulfillment the object of the research. For the research, we analyze Five years data of CHPCL & BPC for the period of five years (F/Y2062/63 to 2066/67).

**Sources of Data & study :**

- Published financial Statement of CHPCL & BPC for five year
- Personal visit
- Official Websites
- Other website
- Books
- Journal /Articles
- Past research study

## 3.4 POPULATION AND SAMPLE

The recent data of NEA (FY-2066/67) forecasted that twenty two hydropower project were generating electricity from privet sector at the period of research.

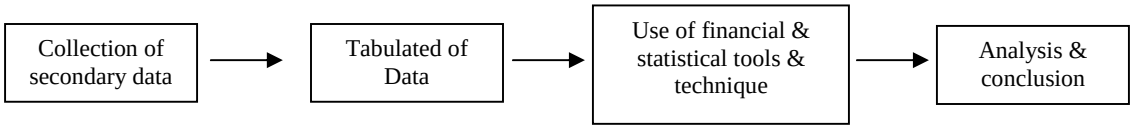
| S.N. | Name of Company | Name of Project | Capacity (KW) |
|---|---|---|---|
| 1 | Himal Power Ltd. | Khimti Khola | 60,000 |
| 2 | Bhotekoshi Power Com. Ltd. | Bhotekoshi Khola | 36,000 |
| 3 | Chilime Hydro P.C.L. (CHPCL) | Chilime | 20,000 |
| 4 | National Hydro Power C.L. | Indrawati - III | 7,500 |
| 5 | Butwal Power C.L. (BPC) | Jhimruk Khola | 12,000 |
| 6 | Butwal Power C.L. (BPC) | Andhi Khola | 5,100 |
| 7 | Syange Bidyut Com. Ltd. | Syange Khola | 183 |
| 8 | Arun Valley Hydro Power C.L. | Piluwa Khola | 3,000 |
| 9 | Rairang HP Dev. Co. (P) Ltd. | Rairang Khola | 500 |
| 10 | Sanima HP Company Ltd. | Sunkoshi Khola | 2,500 |
| 11 | Alliance Power Nepal Pvt.Ltd. | Chaku Khola | 1,500 |
| 12 | Khudi Hydro Power Ltd. | Khudi Khola | 3,450 |
| 13 | Unique Hydel Co. Pvt.Ltd. | Baramchi Khola | 980 |
| 14 | Thoppal Khola HP Co. Pvt. Ltd. | Thoppal Khola | 1,650 |
| 15 | Gautam Buddha HP (Pvt) Ltd | Sisne Khola | 750 |
| 16 | Kathmandu Small HP Sys.P. L. | Sali Nadi | 232 |
| 17 | Khoranga Khola HP Co. Ltd. | Pheme Khola | 995 |
| 18 | Unified Hydropower (P) Ltd. | Pati Khola | 996 |
| 19 | Task HP Company (P.) Ltd. | Seti -II | 979 |
| 20 | Ridi Hydropower Dev. Co. (P.) Ltd. | Ridi Khola | 2,400 |
| 21 | Centre for Power Dev. And Services (P.) Ltd. | Upper Hadi Khola | 991 |
| 22 | Gandaki HP Co. Pvt. Ltd. | Mardi Khola | 3,100 |
| | **Sub Total** | | **166,806** |

*Source: Annual report of NEA, 2066/67*

Out of these, the researcher selects two well-known hydropower companies namely CHPCL (20MW) & Butwal Power Company (17.1MW) for the research propose.

## 3.5 DATA PROCESSING PROCEDURES

In this research, the published data as annual financial reports have been used and processed for the required data. For this propose, the published data were processed and tabulated as per the requirement of the study.




## 3.6 METHOD OF ANALYSIS

In this study, two types of analytical tools were used. They are:

A. Financial Tool
B. Statistical Tool

### A. Financial Tools

Globally used tool for financial analysis is ratio analysis. It quantifies the relationship between two or more sets of financial data taken from income statement and balance sheet. It provides information relating to strengths and weaknesses of the firm. Thus, financial ratio analysis is an important tool to extract additional meaning from the figure of financial statement of a firm.

**Under the ratio analysis the following ratio can be analyzed:**

**a. Composition of working capital**

The composition of working capital has been studied by analyzing the following ratios:

i. **Ratio of Current Assets to Total Assets (CAT):** The ratio of current assets to total assets indicates what percentages of company's total assets has been invested in the form of current assets, which is calculated as:

$$CAT = \frac{Current\ Assets}{Total\ Assets}$$

The increasing level of ratio indicates that increase in profitability & decrease in risk and vice versa.

ii. **Ratio of Current Assets to Fixed Assets (CFA):** This ratio indicates the relationship between the current assets with fixed assets. The ratio is obtained by dividing the current assets by fixed assets.

$$CFA = \frac{Current\ Assets}{Fixed\ Assets}$$

If the ratio is large, then it is shown sound working capital position.

iii. **Ratio of Cash and Bank Balance to Current Assets (CCA)-:** The immediate solvency of the cash is measured with this ratio. As cash and bank balance is the most liquid form of current assets. It shows the relationship between cash & bank balance with total current assets. The ratio represents the portion of cash and bank balance in current assets. It is calculated as:

$$CCA = \frac{Cash\ and\ Bank\ Balance}{Current\ Assets}$$

The ratio should not be large, because higher ratio indicates the poor cash management.

iv. **Ratio of Cash And Bank Balance to Total Assets (CTA)-:** It shows the relationship between cash & bank balance with the total assets. The ratio represents the portion of cash and bank balance in total assets. It is calculated as:

$$CTA = \frac{Cash\ and\ Bank\ Balance}{Total\ Assets}$$

v. **Ratio of Receivable to current assets (RCA)-:** This ratio indicates the portion of receivable on current assets. It indicates what percentage of CA is in the form of receivable. It is calculated by this formula:

$$RCA = \frac{Receivable}{Current\ Assets}$$

Lower percentage is favorable. Higher percentage of ratio indicates the weakness on policies & implementation for collection. Higher ratio indicates that the role of receivable is important.

vi. **Ratio of Receivable to total assets (RTA)-:** This ratio is representing the percentage of total assets invested in the form of receivable, which is calculated as :

$$RTA = \frac{Receivable}{Total\ Assets}$$

Large ratio indicates that the management is adopting liberal inventory policy.

vii. **Ratio of Inventory to Current Assets (ICA):** This ratio is representing the percentage of Current assets invested in the form of receivable, which is calculated as :

$$ICA = \frac{Inventory}{Current\ Assets}$$

Large ratio indicates that the management is adopting liberal inventory policy.

viii. **Ratio of Inventory to Total Assets (ITA):** The percentage of ITA indicated the inventory policy followed by a company where that is liberal or stringent.

$$ITA = \frac{Inventory}{Total\ Assets}$$

Lower ratio of ITA indicates the company strict on managing of inventory & high ratio indicates the liberal policy on it.

**b. Liquidity Position**

Liquidity ratios measures the firm's ability to safety its short-term commitments out of current or liquid assets. These ratios focus on current assets and liabilities and are used to ascertain the short-term solvency position of a firm.

i. **Current Ratio-:** A current ratio is the quantitative relationship between current assets (CA) & current liabilities (CL). Here, CA is those, which can normally be converted into cash within a year. They include cash, inventories, receivables, bank balance, prepaid expenses, marketable securities and so on. On the other hand, CL refers to those obligations, which must be paid within a year. These include accounts payable, bank overdraft, notes payables, accruals and so on. CR is calculated as follows:

$$CR = \frac{Current\ Assets}{Current\ Liabilities}$$

As a conventional rule the ratio 2:1 is employed as a standard of comparison.

ii. **Quick Ratio (QR):** QR, also termed as acid test ratio or liquid ratio, is another measure of short-term solvency of a firm. Quick ratio is defined as the quantitative relationship between Quick assets & current liabilities (CL). It is calculated as follows:

$$QR = \frac{Quick Assets}{Current\ Liabilities}$$

As a conventional rule the ratio 1:1 is employed as a standard of comparison.

**C. Profitability Position:**

The main objective of the company is to earn maximum profit with providing service. The position of the profitability of the company is analyzed with the help of following ratios.

**1- Return on W/C (RWC)**

It measures the profit with respect to CA and can be calculated as:

RWC = (Net profit after tax x 100) / CA

Higher the ratio indicates higher the utilization of CA to earn and vice-versa.

**2- Gross Profit margin Ratio (GPM)**

Gross profit is obtained by deducing cost of goods sold from net sales. The ratio can be obtained as

GPM = (Gross profit x 100)/ Sales

The gross profit margin ratio reflects efficiency with which company produces each unit of produce. The higher percentage indicates the batter efficiency of the company.

**3- Net profit margin Ratio (NPM)**

Net profit is obtained after deducting operating expenses and income tax from gross profit. This ratio establishes the relationship between net

profit and sales. The ratio indicates efficiency of management. It measures the ability of a firm to earn each rupee of sales into net profit. It is computed as:

NPM = (Net profit after tax x 100)/ Sales.

The higher percentage indicates the batter efficiency of the company.

**4- Return on Total Assets (ROA)**

It also called return on investment. This ratio is computed by dividing net project after tax by total assets. The return on assets is a useful measure of the profitability of all financial sources invested in the firm's assets.

ROA = (Net profit after tax x 100) / Total Assets

The higher percentage indicates the batter efficiency to utilize of its total assets.

**5- Return on Shareholder's equity (ROSE)**

This ratio indicates how well the firm has used the resources of the owners. This ratio is one of the most important relationships in ratio analysis. It also called return on net worth. It can be calculate as:

ROSE = (Net profit after tax x 100) / Shareholders' equity

High ratio is preferable.

## B. STATISTICAL TOOLS

### a. Average

The most popular and widely used measure of representing the entire data by the one value is known as average. Its value is obtained by adding together all times

and the summation of times is divided by the number of sample periods. If the past items of the sample periods are $X_t$ , number of periods are n , then Mean is defined as follows

$$\bar{X} = \frac{(X_1 + X_2 + X_3 + X_4 + \ldots\ldots\ldots\ldots X_n)}{n}$$

**b. Trend Analysis**

In working capital analysis the direction of the change over a period of three years is very crucial. For trend analysis, the use of index number is generally advocated. The procedure followed is to assign the number of 100 to items to base year and calculate % change in each item of other years with relation to the base year. This procedure may be called as trend percentage method.

So index number is a device for measuring change in the magnitude of the phenomena from time to time or event from place to place. Index Number or Trend percentage method is used to in the study to evaluate trends of relative items of working capital. Trend percentage of each study year can be calculated by the following formula-

$$\text{Trend \%} = \frac{(\text{Current Year's Price})}{\text{Fixed Base Last Year's Price}} \times 100$$

**c. Correlation Analysis**

The correlation coefficient analysis referred to the tool that is used in measuring the closeness of the relationship between two or more than two variables.

"The correlation is a defined as the relationship between (among) the dependent variables (or factor) and one or more than one independent variables or factors. In other words, Correlation is the relationship between (or among two or more

variable (s) i.e. only one variables depended or more variables (s) independent (Shrestha & Dhurba, 2057:315)

The Karl Pearson's coefficient of correlation is denoted by symbol (r). It measures the relationship between two variables. The Karl Pearson's coefficient of correlation (r) is calculated by using following formula.

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

Interpretation of correlation Coefficient (r) –

1. The coefficient of correlation as obtained by the above formula always lies between + 1 to –1.
2. When r is +1, then there is positively perfect correlation between the two variables.
3. When r is –1, then there is negatively perfect correlation between the variables.
4. When the value of r is between 0.7 to 0.999, then there high degree of correlation between variables.
5. When r is between 0.5 to 0.999, then there is moderate degree of correlation between the variables.
6. When r is less than 0.5, then there is low degree of correlation between the variable.
7. When r is 0 (zero), then there is no correlation between the variable or the variables are correlated.

## D. Student's t-test for hypothesis

To test the validity of the assumptions, t-test is used when the sample size is less than thirty. Student's t-value is calculated first compared with table value of 't' at a certain level of significance for giving degree of freedom.

$$t = r \times \frac{\sqrt{n-2}}{\sqrt{1-r^2}}$$

Where,

t = Student's t-value

r = Coefficient of correlation

n= No. of observation

On testing, the null hypothesis will be rejected if the calculated t-value is greater than table value at 5% level of significance for n-2 degree of freedom & indicates that value of correlation coefficient is significant at 5% level of significance or vice versa.

# CHAPTER - IV
# PRESENTATION AND ANALYSIS OF DATA

## 4.1 INTRODUCTION

This is the fourth steps of research paper. Research work had done to know the facts. For these, data were presented and analyzed. In this chapter, researcher tabulates the secondary data, analyzed them using financial ratio, statistical method & tested the significance of relationship between variables using student's t-test to fulfill the research objectives with sequence of analysis.

**Descriptive & Analytical Study**

This section attempts to describe and compare some variables as relevant ratios of working capital of CHPCL & BPC for the period 2062/63 to 2066/67 BS. Then, they were analyzed using various statistical tools & tested the significance of relationship between variables. Basically this chapter deals,

- The working capital structure.
- The composition of working capital.
- The liquidity position of the sampled companies.
- The profitability position of sampled companies.
- The efficiency of Working Capital

## 4.1 WORKING CAPITAL STRUCTURE

The term structure explores the units of particular subject. The structure of working capital introduce to its component. Usually, the company's working capital consists of inventory, receivables and cash. Receivable & cash are considered the more liquid form of assets than inventory. Hence, the greater the proportionate size of inventory, the less liquid would be the nature of working

capital or vice-versa. This section introduced the structure of working capital of CHPCL & BPC.

## Working capital structure of CHPCL

***TABLE-3***

***COMPOSITION OF GROSS WORKING CAPITAL OF CHPCL***

Rs. In million

| | | Detail of Current Assets | | | | | |
|---|---|---|---|---|---|---|---|
| **Fiscal Year** | **Total Current Assets (CA)** | **Inventory** | **Debtors** | **Cash & other** | **Advance & Loan to staff** | **Prepaid & Deposits** | **Short term Investment** |
| 2062/63 | 206.83 | 10.30 | 119.79 | 64.25 | 2.00 | 10.49 | - |
| 2063/64 | 241.80 | 12.09 | 183.96 | 34.23 | 1.87 | 9.65 | - |
| 2064/65 | 646.23 | 22.32 | 189.69 | 277.11 | 1.71 | 29.51 | 125.89 |
| 2065/66 | 995.07 | 36.89 | 108.66 | 248.47 | 3.65 | 60.62 | 536.79 |
| 2066/67 | 1,450.09 | 30.90 | 209.48 | 44.13 | 3.22 | 64.10 | 1,098.26 |
| **Average** | **708.01** | **22.50** | **162.32** | **133.64** | **2.49** | **34.87** | **352.19** |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

According to ***Table-3,*** Short term investment occupied the important places in the structure of its working capital. Next to Debtors, cash obtained the important and the middle place in the structure of working capital of CHPCL. Prepaid & deposits was taken fourth place whenever inventory fifth position an average.

In the last year, 2066/67 BS, very huge amount of current assets occupied by short term investment that indicate the company invest it's current assets on short term investment by deposited in the bank for safety. And the next, debtors played important role to maintain its working capital.

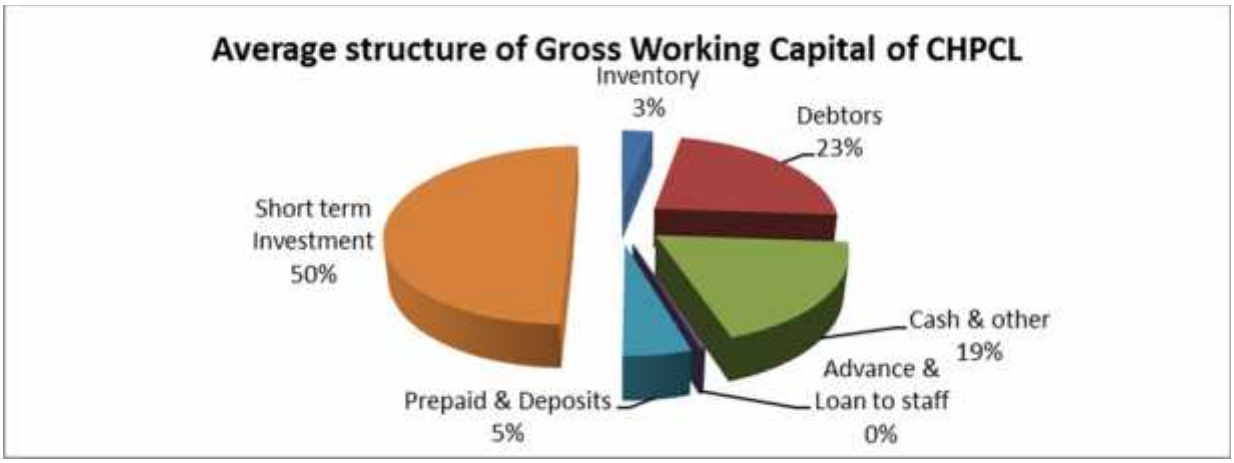



**Fig 3: Average composition of Working capital of CHPCL**

***Figure-3*** also represented that short term investment covered fifty percentage area of total working capital structure.

**Working capital structure of BPC**

***TABLE:4***

***COMPOSITION OF GROSS WORKING CAPITAL OF BPC***

Rs. In million

| | | Detail of Current Assets | | | |
|---|---|---|---|---|---|
| **Fiscal Year** | **Total Current Assets (CA)** | **Inventory** | **Debtors & Receivable** | **Cash & Bank Balance** | **Advance & Deposits** |
| 2062/63 | 524.02 | 57.62 | 35.51 | 364.37 | 66.51 |
| 2063/64 | 647.42 | 58.90 | 58.92 | 457.04 | 72.57 |
| 2064/65 | 746.14 | 74.65 | 88.41 | 412.64 | 170.45 |
| 2065/66 | 743.84 | 92.72 | 171.36 | 291.69 | 188.07 |
| 2066/67 | 651.52 | 104.54 | 93.69 | 234.89 | 218.40 |
| **Average** | **662.59** | **77.69** | **89.58** | **352.12** | **143.20** |

Source : Annual Report of BPC, 2066/67

According to ***Table-3,*** Cash & bank occupied the important places in the structure of its working capital. Next to Advance & deposits obtained place in the middle & debtors & inventory was taken fourth & fifth place.

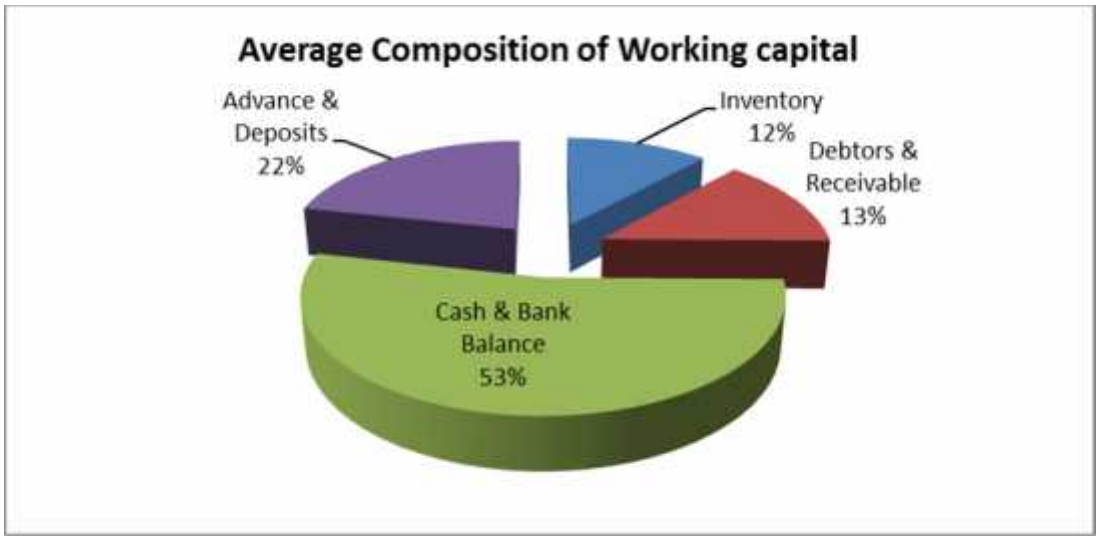



**Fig 4: Average composition of Working capital of BPC**

***Figure-4*** also represented that cash & bank balance covered fifty three percentage of total portion of working capital.

## 4.2 COMPOSITION OF WORKING CAPITAL

This section interprets the composition of working capital of both companies using financial ratio and test the significance of correlation coefficient by testing of hypothesis.

### A. Raito of Current Assets to Total Assets (CAT)

The ratio of current assets to total assets indicates what percentage of company's total asset has been invested in the form of current assets.

## CAT of CHPCL

***TABLE :-5***

***RATIO OF CURRENT ASSETS TO TOTAL ASSETS (CAT) of CHPCL***

Rs. In million

| Fiscal Year | Current Assets | Total Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 206.83 | 2,406.79 | 0.09 | 100.00 |
| 2063/64 | 241.80 | 2,375.74 | 0.10 | 118.44 |
| 2064/65 | 646.23 | 2,865.71 | 0.23 | 262.41 |
| 2065/66 | 995.07 | 3,134.87 | 0.32 | 369.37 |
| 2066/67 | 1,450.09 | 3,577.42 | 0.41 | 471.68 |
| **Total** | **3,540.02** | **14,360.53** | **1.14** | |
| **Mean value** | **708.00** | **2,872.11** | **0.23** | |
| **SD** | **525.70** | **507.31** | **0.14** | |
| **CV %** | **74.25** | **17.66** | **60.50** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

According to ***Table-5,*** the ratio of CAT of CHPCL was in increasing level each year ie.0.09 time to 0.41 times. Average ratio i.e. 0.23 times indicated that the company maintained 23% liquidity of its total assets. Therefore, this exposes that current assets were properly arranged as per the increase in total assets. But the figure of variance i.e.60.50% seems very fluctuate during study period.

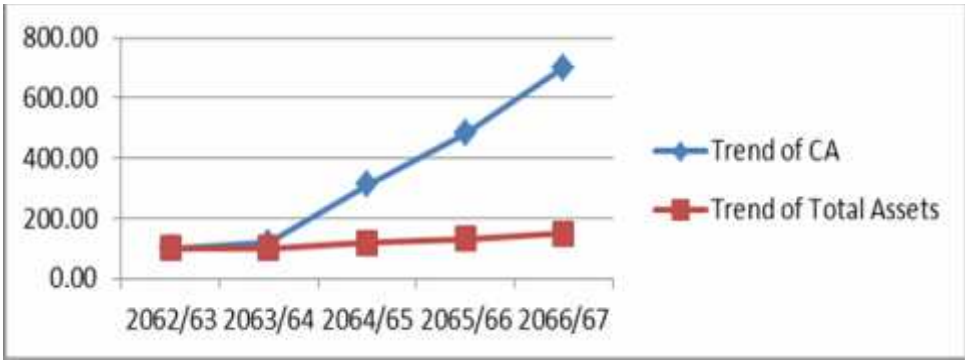



**Fig 5: Trend of ratio of current assets to total assets of CHPCL**.

The relationship between current assets and total assets may be uniform or not i.e. the increases in total assets do not necessary increase the proportion of current assets in its consumption**.** But,

***Figure-5*** has shown the trend of Current assets was similar with trend line of Total assets for the previous two year and then increasing ratio was high of CA in comparative of Total assets. So, Hypothesis is used at *TABLE* 6.1 below to test the reality of significance on relation of trend of CAT.

**CAT of BPC**

***TABLE :-6***

***RATIO OF CURRENT ASSETS TO TOTAL ASSETS (CAT) of BPC***

(Rs.in million )

| Fiscal Year | Current Assets | Total Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 524.02 | 1,744.45 | 0.30 | 100.00 |
| 2063/64 | 647.42 | 1,882.27 | 0.34 | 114.50 |
| 2064/65 | 746.14 | 1,991.69 | 0.37 | 124.71 |
| 2065/66 | 743.84 | 2,264.20 | 0.33 | 109.36 |
| 2066/67 | 651.52 | 2,341.44 | 0.28 | 92.63 |
| **Total** | **3,312.93** | **10,224.05** | **1.63** | |
| **Mean value** | **662.59** | **2,044.81** | **0.33** | |
| **SD** | **91.01** | **252.78** | **0.04** | |
| **CV** | **0.137** | **0.124** | **0.115** | |

Source: Annual Report of BPC, 2066/67

According to ***TABLE-6,*** the ratio of CAT of BPC indicates that there was fluctuation in the ratio every year during five year period. In the last year, the ratio came to lower level but the variance of CAT was at a low level i.e. 11.5%. Average value of ratio i.e. 0.33 times indicated that during the five year period

BPC maintained 33% liquidity in its total assets. Therefore, this exposes that current assets were properly arranged as per the trend of fluctuation.

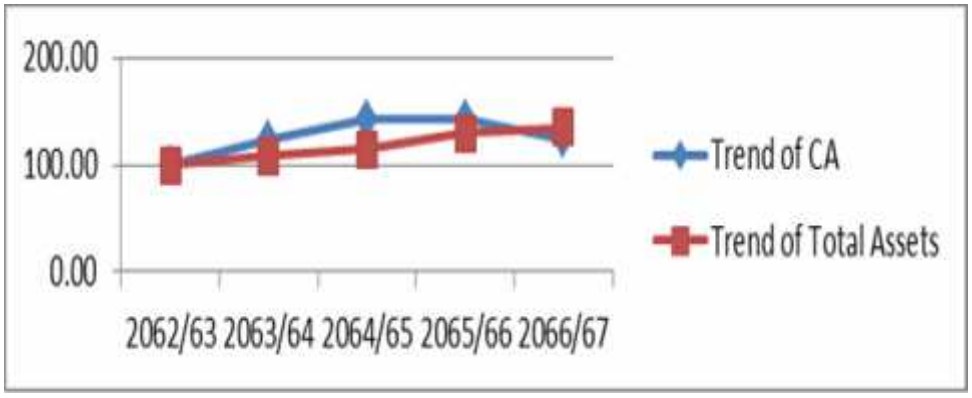



**Fig 6: Trend of ratio of current assets to total assets of BPC**

***Figure-6*** has shown the trend of CAT of BPC during five year period. In the first three year, the trend of growing was similarity but after that the line of current assets gone to downward. It happened due to decrease in cash-bank balance & receivable although other variables were in upward position. Hypothesis is used at ***TABLE-*** 6.1 below to test the reality of significance on relation of trend of CAT.

**Testing the Hypothesis of the relationship between Current assets & Total assets**

***Hypothesis Ho1:***

***There is no significant relation between Current Assets & Total Assets of CHPCL & BPC.***

The ***TABLE-*** 6.1 represents the correlation coefficient of the Current assets & Total assets and test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

***TABLE-*** **6.1**

**The correlation coefficient of current assets & Total assets, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2) | Result |
|---|---|---|---|---|---|---|
| **CAT** | CHPCL | 0.9973 | 23.5231 | 3.182 | 3 | Significant |
| | BPC | 0.5889 | 1.2621 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is greater than table value, so null hypothesis rejected. So, it means Current assets affected to Total Assets of CHPCL.

**Result for BPC:**

The calculated value of "t" is lower than table value, so null hypothesis accepted. So, there is no significant relation between Current Assets & Total Assets of BPC.

**B. Raito of Current Assets to Fixed Assets (CFA)**

This ratio indicates the relationship between the current assets with fixed assets. The ratio is obtained by dividing the current assets by fixed assets. If the ratio is large, then it is shown sound working capital position.

## CFA of CHPCL

***TABLE :- 7***

***RATIO OF CURRENT ASSETS TO FIXED ASSETS (CFA) of CHPCL***

Rs. In million

| Fiscal Year | Current Assets | Fixed Assets | Ratio (in times) | Trend of CFA |
|---|---|---|---|---|
| 2062/63 | 206.83 | 2,189.25 | 0.09 | 100.00 |
| 2063/64 | 241.80 | 2,114.37 | 0.11 | 121.05 |
| 2064/65 | 646.23 | 2,011.86 | 0.32 | 339.99 |
| 2065/66 | 995.07 | 1,916.28 | 0.52 | 549.64 |
| 2066/67 | 1,450.09 | 1,869.35 | 0.78 | 821.08 |
| **Total** | **3,540.02** | **10,101.12** | **1.83** | |
| **Mean value** | **708.00** | **2,020.22** | **0.37** | |
| **SD** | **525.70** | **133.30** | **0.29** | |
| **CV %** | **74.25** | **6.60** | **78.74** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

Ratio of CFA of CHPCL indicates the relationship between current assets & fixed assets. The ***TABLE-7*** represented that ratio of CFA was in increasing trend between five year period from 0.09 to 0.78 times respectively with a high variance of 78.74%. Although variance was in high level, the increased level of CFA shown sound of working capital position of CHPCL.

Also ***Figure-7*** has shown the trend of CFT of CHPCL during five year period. The trend line of fixed assets was in decreasing level due to depreciation & current assets were in upward position. It has shown sound of working capital position. Hypothesis is used at ***TABLE***-8.1 below to test the reality of significance on relation of trend of CFA.

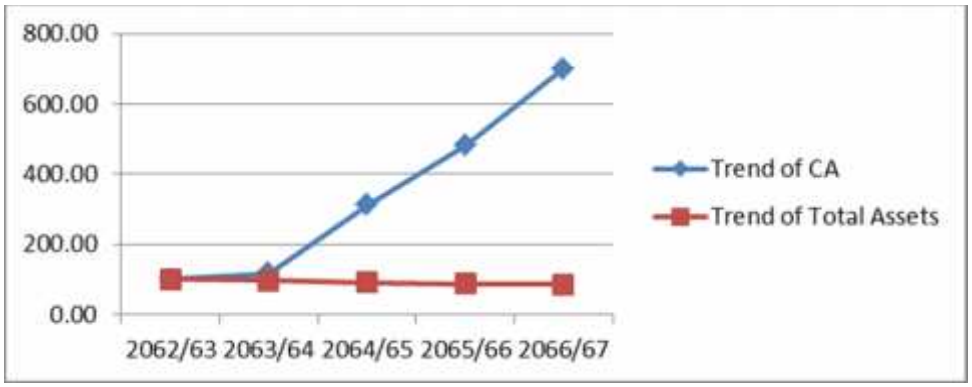



**Fig 7: Trend of ratio of current assets to fixed assets of CHPCL**

## CFA of BPC

***TABLE- :-8***

***RATIO OF CURRENT ASSETS TO FIXED ASSETS (CFA) of BPC***

(Rs.in million )

| Fiscal Year | Current Assets | Fixed Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 524.02 | 743.61 | 0.70 | 100.00 |
| 2063/64 | 647.42 | 743.89 | 0.87 | 123.50 |
| 2064/65 | 746.14 | 725.74 | 1.03 | 145.89 |
| 2065/66 | 743.84 | 765.34 | 0.97 | 137.92 |
| 2066/67 | 651.52 | 781.67 | 0.83 | 118.28 |
| **Total** | **3,312.93** | **3,760.25** | **4.41** | |
| **Mean value** | **662.59** | **752.05** | **0.88** | |
| **SD** | **91.01** | **21.70** | **0.13** | |
| **CV** | **0.137** | **0.029** | **0.143** | |

Source : Annual Report of BPC, 2066/67

The ***TABLE--8*** represented that ratio of CFA in BPC was in increasing trend during 1st to 3rd year due to increased value of CA but in the 4rth & 5th year value of fixed assets increased slowly & CA went down. So, the ratio decreased in two year up to 0.83 times. The average variance of the ratio was 14.3% which was not

higher. So, it has also shown sound working capital position during the study period.

Also ***Figure-8*** has shown the trend of CFA of BPC of past five year period. The trend line also shown that ratio of CFT was in upward position but in 4rth & 5th year period it gone to downward. Hypothesis is used at ***TABLE--*** 8.1 below to test the reality of significance on relation of trend of CFT.

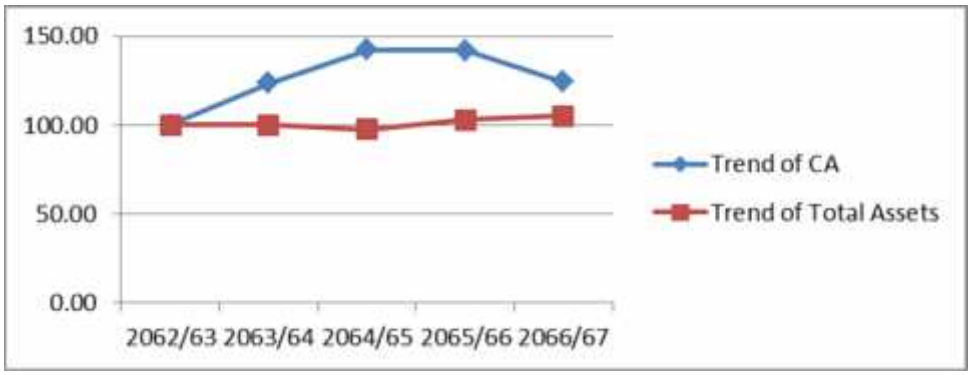



**Fig 8: Trend of ratio of current assets to fixed assets of BPC**

**Testing the Hypothesis of the relationship between Current assets & Fixed assets**

***Hypothesis Ho2:***

There is no significant relation between Current Assets & Fixed Assets of CHPCL & BPC.

The ***TABLE--*** 8.1 represents the correlation coefficient of the Current assets & Fixed assets and test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

***Table*- - 8.1**

**The correlation coefficient of Current assets & Fixed assets, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| **CFA** | CHPCL | -0.9629 | 6.1804 | 3.182 | 3 | Significant |
| | BPC | -0.0193 | 0.0334 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is greater than table value, so null hypothesis rejected. It indicates that there was significant relation between Current Assets & Fixed Assets of CHPCL or trend of Current assets affected to fixed assets with perfect negative correlation.

**Result for BPC:**

The calculated value of "t" is lower than table value, so null hypothesis accepted. It shows there was no significant relation between Current Assets & fixed Assets of BPC and it has perfect negative relation between them.

**C. Raito of Cash & Bank balance to Current Assets (CCA)**

The immediate solvency of the cash is measured with this ratio. As cash and bank balance is the most liquid form of current assets. It shows the relationship between cash & bank balance with total current assets. The ratio represents the portion of cash and bank balance in current assets. The ratio should not be large, because higher ratio indicates the poor cash management.

## CCA of CHPCL

***TABLE -9***

***RATIO OF CASH TO CURRENT ASSETS (CCA) of CHPCL***

Rs. In millions

| Fiscal Year | Cash & others | Current Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 64.25 | 206.83 | 0.31 | 100.00 |
| 2063/64 | 34.23 | 241.80 | 0.14 | 45.57 |
| 2064/65 | 277.11 | 646.23 | 0.43 | 138.04 |
| 2065/66 | 248.47 | 995.07 | 0.25 | 80.39 |
| 2066/67 | 44.13 | 1,450.09 | 0.03 | 9.80 |
| **Total** | **668.19** | **3,540.03** | **1.16** | |
| **Mean value** | **133.64** | **708.01** | **0.19** | |
| **SD** | **118.83** | **525.70** | **0.15** | |
| **CV %** | **88.92** | **74.25** | **66.03** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

The immediate solvency of cash is measured with this ratio. The trend of ratio was in fluctuated position. In the beginning of the year there was 0.31 times of CCA i.e. the portion of cash in current assets was 31 % but in the second year it gone to 0.14 times and then in 3$^{rd}$ year again it gone to 0.43 times but, from the 4rth period it gone sharp decline up to 0.03 times. The variance of CCA also represented with 66.03%. It shows that the company was not followed the policy for maintain its immediate solvency. It might be danger to the company because the cash & bank balance occupied only 19 percent of total assets.

The ***Figure-9 of CCA*** has shown the clear map of position of cash level maintained by CHPCL where the trend of CA was in upward position but the position of cash was in fluctuated trend. Hypothesis is used at ***TABLE***-- 10.1 below to test the reality of significance on relation of trend of CCA.

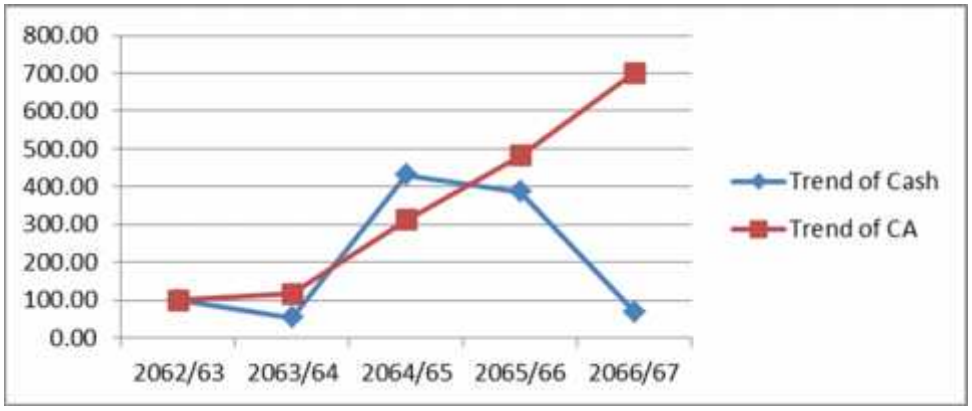



**Fig 9: Trend of ratio of cash to current assets of CHPCL**

## CCA of BPC

***TABLE -10***

***RATIO OF CASH TO CURRENT ASSETS (CCA) of BPC***

(Rs.in million )

| Fiscal Year | Cash | Current Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 364.37 | 524.02 | 0.70 | 100.00 |
| 2063/64 | 457.04 | 647.42 | 0.71 | 101.52 |
| 2064/65 | 412.64 | 746.14 | 0.55 | 79.53 |
| 2065/66 | 291.69 | 743.84 | 0.39 | 56.40 |
| 2066/67 | 234.89 | 651.52 | 0.36 | 51.85 |
| **Total** | **1,760.62** | **3,312.93** | **2.71** | |
| **Mean value** | **352.12** | **662.59** | **0.54** | |
| **SD** | **89.74** | **91.01** | **0.16** | |
| **CV** | **0.255** | **0.137** | **0.301** | |

Source: Annual Report of BPC, 2066/67

In ***TABLE***-- 10, we can see the trend of CCA of BPC can be seen fluctuating. In the beginning of the year there was 0.70 times of CCA i.e. the portion of cash in current assets was 70 %. In the second year it was 0.71 times but in the third year

it went down to 0.55 times and then in the 4th year again it went to 0.39 times and continued to go down and reached to 0.36 times. This shows that management of cash and bank balance in BPC is not very efficient. This can also be presented diagrammatically as;

***Figure*10** shows the trend ratio of CCA. We can easily see and understand how the ratio fluctuated, a little rise in the beginning with continued decline afterwards but the declining trend was same. So, hypothesis is used at ***TABLE*--**10.1 below to test the reality of significance on relation on variable of CCA.

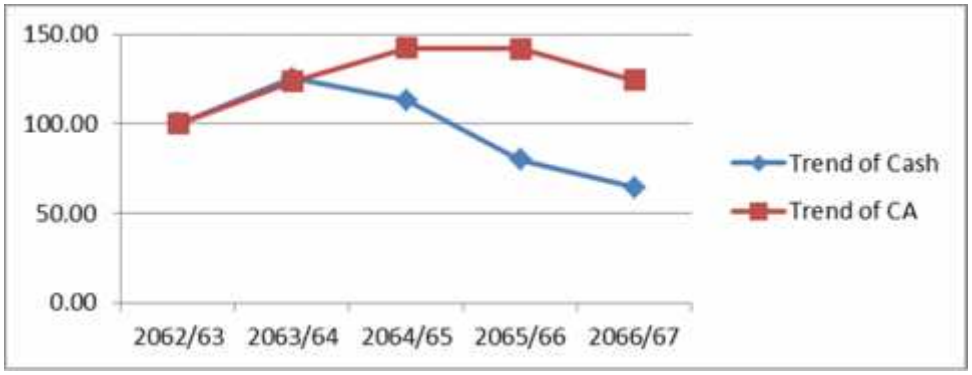



**Fig 10: Trend of ratio of cash to current assets of BPC**

**Testing the Hypothesis of the relationship between Cash & Bank balance & Current assets**

***Hypothesis Ho3:***

There is no significant relation between Cash & Bank Balance & Current Assets CHPCL & BPC.

The ***TABLE*--** 10.1 represents the correlation coefficient of the Cash & Bank balance and Current assets, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

***TABLE*- 10.1**

**The correlation coefficient of cash & bank with current assets, calculated student's t-value & *Table*- value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| CCA | CHPCL | 0.1553 | 0.2723 | 3.182 | 3 | Not Significant |
| | BPC | -0.0565 | 0.0980 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is lower than table value, so null hypothesis is acceptable. It shows that there was no significant relation between the trend of Cash & other with Current Assets.

**Result for BPC:**

For BPC, the calculated value of "t" also lower than table value, so null hypothesis accepted. It means there was no significant relation between trend of Cash & bank with trend of Current Assets. There was perfect negative relation.

**D. Raito of Cash & Bank balance to Total Assets (CTA)**

It shows the relationship between cash & bank balance with the total assets. The ratio represents the portion of cash and bank balance in total assets

## CTA of CHPCL

***TABLE -11***

***RATIO OF CASH TO TOTAL ASSETS (CTA) of CHPCL***

Rs. In million

| Fiscal Year | Cash & others | Total Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 64.25 | 2,406.79 | 0.03 | 100.00 |
| 2063/64 | 34.23 | 2,375.74 | 0.01 | 53.97 |
| 2064/65 | 277.11 | 2,865.71 | 0.10 | 362.24 |
| 2065/66 | 248.47 | 3,134.87 | 0.08 | 296.92 |
| 2066/67 | 44.13 | 3,577.42 | 0.01 | 46.21 |
| **Total** | **668.19** | **14,360.53** | **0.23** | |
| **Mean value** | **133.64** | **2,872.11** | **0.05** | |
| **SD** | **118.83** | **507.31** | **0.04** | |
| **CV %** | **88.92** | **17.66** | **85.68** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

It shows the relationship between cash and bank balance with total assets. The ratio represents the portion of cash and bank balance in total assets. We can see CTA ratio 0.03 times in the Fiscal Year 2062/63, lowered to 0.01 times in the second year, rose to 0.10 in the third year, a little decline again to 0.08 and a sharp decline to 0.01 in the fifth year. And CV 85.68% in the table displays higher fluctuation which is not significant for the company. It means that the company went ahead with without any plans to manage cash. The same trend is being represented by the **Figure 11**.

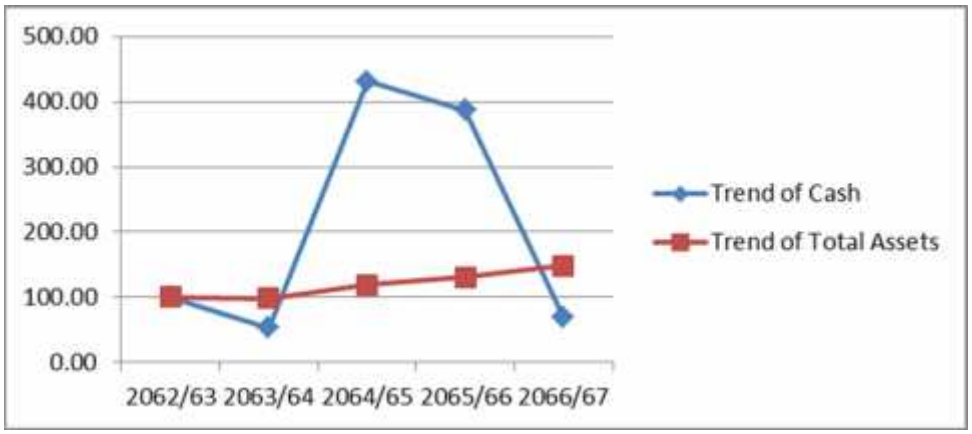



**Fig 11: Trend of ratio of cash to total assets of CHPCL**

Hypothesis is used at ***TABLE--*** 12.1 below to test the reality of significance on relation of trend of CTA.

## CTA of BPC

***TABLE -12***

***RATIO OF CASH TO TOTAL ASSETS (CTA) of BPC***

(Rs.in million )

| Fiscal Year | Cash | Total Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 364.37 | 1,744.45 | 0.21 | 100.00 |
| 2063/64 | 457.04 | 1,882.27 | 0.24 | 116.25 |
| 2064/65 | 412.64 | 1,991.69 | 0.21 | 99.19 |
| 2065/66 | 291.69 | 2,264.20 | 0.13 | 61.68 |
| 2066/67 | 234.89 | 2,341.44 | 0.10 | 48.03 |
| **Total** | **1,760.62** | **10,224.05** | **0.89** | |
| **Mean value** | **352.12** | **2,044.81** | **0.18** | |
| **SD** | **89.74** | **252.78** | **0.06** | |
| **CV** | **0.255** | **0.124** | **0.339** | |

Source : Annual Report of BPC, 2066/67

***TABLE*--** 12 shows the relationship between cash and bank balance with total assets of BPC. The ratio represents the portion of cash and bank balance in total assets. We can see CTA ratio 0.21 times in the Fiscal Year 2062/63, 0.24 times in the 2063/64, again 0.21 in the third, going a little down to 0.13 in 2065/66 and going again a little down to 0.10 in 2066/67. Here CV is 33.9% which means less fluctuation in the CTA. The main reason behind this was that the cash trend continued to decrease and total assets continued to increase.

***Figure 12*** shows that the trend line of CTA went up for the beginning two years and then went downwards. Hypothesis is used at ***TABLE*--** 12.1 below to test the reality of significance on relation of trend of CTA.

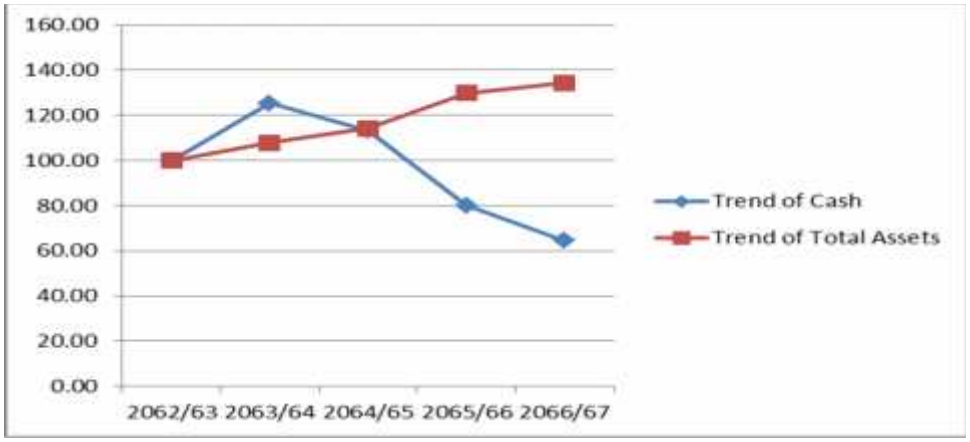



**Fig 12: Trend of ratio of cash to total assets of BPC**

**Testing the Hypothesis of the relationship between Cash & Bank balance & Total assets**

***Hypothesis Ho4:***

There is no significant relation between Cash & Bank Balance & Total Assets CHPCL & BPC.

The ***TABLE-***12.1 represents the correlation coefficient of the Cash & Bank balance and Current assets, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

***TABLE-*** **12.1**

**The correlation coefficient of Cash & Bank to Total assets, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| **CTA** | **CHPCL** | 0.1981 | 0.3501 | 3.182 | 3 | Not Significant |
| | **BPC** | -0.7933 | 2.2569 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated "t" value is lower than table value, so null hypothesis is accepted. It shows that there was no significant relation between trend of Cash & other with trend of Total assets.

**Result for BPC:**

For BPC, the calculated value of "t" is lower than table value, so null hypothesis also accepted. So, there was no significant relation between trend of Cash & bank to Total Assets.

**E. Raito of Receivable to Current Assets (RCA)**

Ratio of receivable to current assets indicates the portion of receivable on current assets. It shows the relationship between receivable & current assets. Lower percentage is favorable. Higher percentage of ratio indicates the weakness on policies & implementation on collection.

## RCA of CHPCL

***TABLE -13***

***RATIO OF RECEIVABLE TO CURRENT ASSETS (RCA) of CHPCL***

Rs. In million

| Fiscal Year | Receivable | Current Assets | Ratio (%) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 119.79 | 206.83 | 57.92 | 100.00 |
| 2063/64 | 183.96 | 241.80 | 76.08 | 131.36 |
| 2064/65 | 189.69 | 646.23 | 29.35 | 50.68 |
| 2065/66 | 108.66 | 995.07 | 10.92 | 18.85 |
| 2066/67 | 209.48 | 1,450.09 | 14.45 | 24.94 |
| **Total** | **811.58** | **3,540.03** | **188.72** | |
| **Mean value** | **162.32** | **708.01** | **37.74** | |
| **SD** | **45.08** | **525.70** | **28.33** | |
| **CV %** | **27.78** | **74.25** | **75.05** | |

Source : Annual Report of CHPCL, (2062/63 to 2066/67)

Table-13 shows the favorable portion on receivable of CHPCL according to RCA. In the beginning two years RCA was in upward position which was not favourable for the company but continued rapid decline of the ratio from the third year with variance of 75.05%. But the value of receivable was in fluctuated trend with 27.78% CV. At the end of fifth year of study period the value of receivable gone to 209.48 million from 108.66 million. The main reason was behind that only one debtor of the company was NEA which was not paid in time. So, the ratio of RCA did not represent the actual position of receivable of the company due to huge degree of variance i.e. 74.25% on current assets.

***Figure13*** also shows the same trend of CHPCL. Hypothesis is used at ***TABLE***--14.1 below to test the reality of significance on relation of trend of RCA.

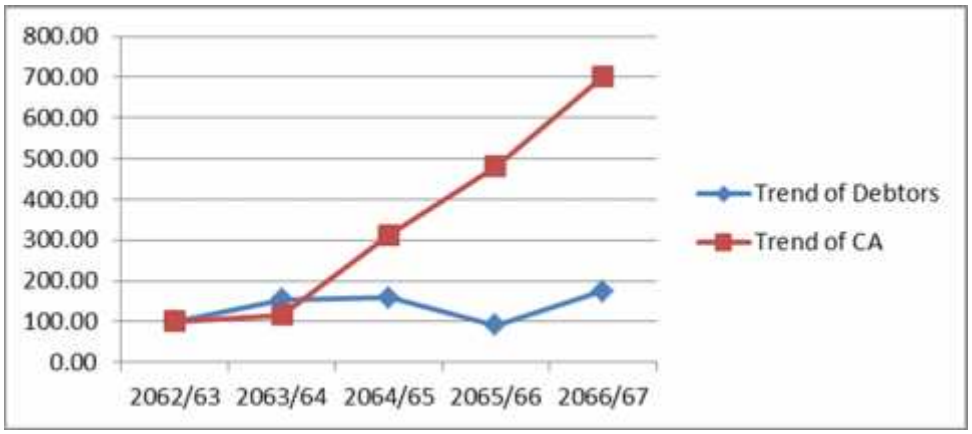



**Fig 13: Trend of ratio of Receivable to current assets of CHPCL**

## RCA of BPC

***TABLE- NO :-14***

***RATIO OF RECEIVABLE TO CURRENT ASSETS (RCA) of BPC***

(Rs.in million )

| Fiscal Year | Debtors & Receivable | Current Assets | Ratio (%) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 35.51 | 524.02 | 6.78 | 100.00 |
| 2063/64 | 58.92 | 647.42 | 9.10 | 134.29 |
| 2064/65 | 88.41 | 746.14 | 11.85 | 174.84 |
| 2065/66 | 171.36 | 743.84 | 23.04 | 339.94 |
| 2066/67 | 93.69 | 651.52 | 14.38 | 212.20 |
| **Total** | **447.89** | **3,312.93** | **65.14** | |
| **Mean value** | **89.58** | **662.59** | **13.03** | |
| **SD** | **51.40** | **91.01** | **6.28** | |
| **CV** | **0.574** | **0.137** | **0.482** | |

Source : Annual Report of BPC, 2066/67

According to *Table*- no-14 of BPC, the trend of RCA was suffering with fluctuated position having 48.2% of CV. In the beginning four years RCA was in upward position which was not favorable for the company but at the fifth year of

study it declined to 14.38 times. The variance of debtors & receivable i.e. 57.40% was similar with the CV of RCA i.e.48.20%, thus the ratio represented the trend of receivable. The main reason was behind that NEA was the main debtors of the BPC. The receivable position was directly related with payment made by NEA.

***Figure14*** represented the same trend line of RCA of BPC. Hypothesis is used at ***TABLE***-- 14.1 below to test the reality of significance on relation of trend of RCA.

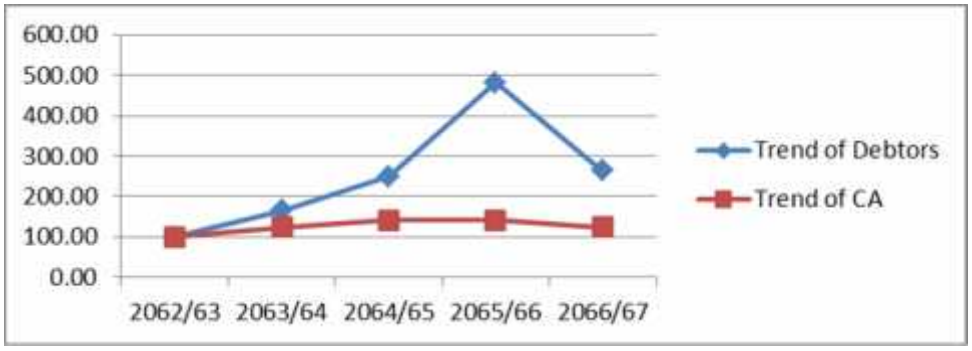



**Fig 14: Trend of ratio of Receivable to current assets of BPC**

**Testing the Hypothesis of the relationship between Receivable & Current assets**

***Hypothesis Ho5:***

There is no significant relation between Receivable & Current Assets CHPCL & BPC.

The ***TABLE***-- 14.1 represents the correlation coefficient of the Receivable & Current Assets, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

*TABLE*- **14.1**

**The correlation coefficient of Receivable & current assets, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| **RCA** | **CHPCL** | 0.3072 | 0.5591 | 3.182 | 3 | Not Significant |
| | **BPC** | 0.7726 | 2.1077 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is lower than table value, so null hypothesis accepted. It shows that there was no significant relation between trends of Current Assets & Receivable of CHPCL.

**Result for BPC:**

The calculated value of "t" is lower than table value, so null hypothesis accepted. It shows that there was no significant relation between trends of Current Assets & Receivable of BPC.

**F. Raito of Receivable to Total Assets (RTA)**

This ratio representing the contribution of receivable in total assets or, it is representing the percentage of total assets invested in the firm of receivable. High degree of RTA shows the liberal credit policy.

## RTA of CHPCL

***TABLE-15***

***RATIO OF RECEIVABLE TO TOTAL ASSETS (RTA) of CHPCL***

Rs. In million

| Fiscal Year | Receivable | Total Assets | Ratio (%) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 119.79 | 2,406.79 | 4.98 | 100.00 |
| 2063/64 | 183.96 | 2,375.74 | 7.74 | 155.57 |
| 2064/65 | 189.69 | 2,865.71 | 6.62 | 132.99 |
| 2065/66 | 108.66 | 3,134.87 | 3.47 | 69.64 |
| 2066/67 | 209.48 | 3,577.42 | 5.86 | 117.65 |
| **Total** | **811.58** | **14,360.53** | **28.66** | |
| **Mean value** | **162.32** | **2,872.11** | **5.73** | |
| **SD** | **45.08** | **507.31** | **1.62** | |
| **CV %** | **27.78** | **17.66** | **28.33** | |

Source : Annual Report of CHPCL, (2062/63 to 2066/67)

Table-16 of RTA represented that the contributed proportion of receivable in total assets which was between 3.47 to 7.74 times during five year period with 28.33% CV. It indicated the company did not followed liberal credit policy because the main debtor paid receivable according to power purchase agreement.

***Figure15*** represents clearly that the portion was hold by receivable on total assets & trend of receivable. Hypothesis is used at ***TABLE--*** 16.1 below to test the reality of significance on relation of trend of RTA.

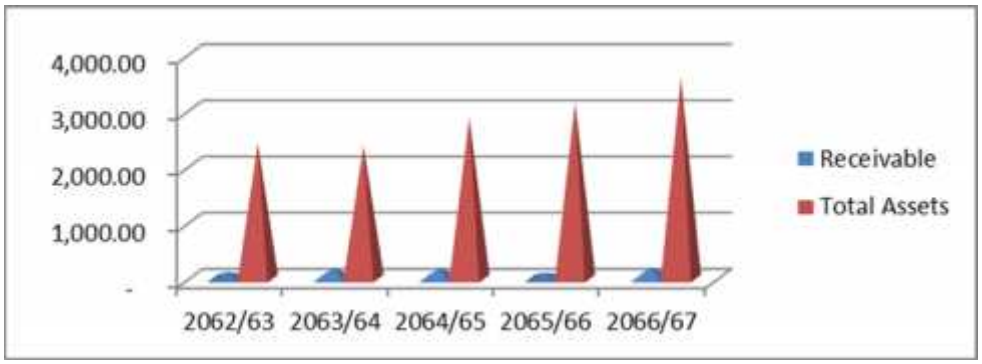



**Fig 15: Trend of ratio of Receivable to total assets of CHPCL**

## RTA of BPC

***TABLE-16***

***RATIO OF RECEIVABLE TO TOTAL ASSETS (RTA) of BPC***

(Rs.in million )

| Fiscal Year | Debtors & Receivable | Total Assets | Ratio (%) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 35.51 | 1,744.45 | 2.04 | 100.00 |
| 2063/64 | 58.92 | 1,882.27 | 3.13 | 153.76 |
| 2064/65 | 88.41 | 1,991.69 | 4.44 | 218.05 |
| 2065/66 | 171.36 | 2,264.20 | 7.57 | 371.77 |
| 2066/67 | 93.69 | 2,341.44 | 4.00 | 196.56 |
| **Total** | **447.89** | **10,224.05** | **21.17** | |
| **Mean value** | **89.58** | **2,044.81** | **4.23** | |
| **SD** | **51.40** | **252.78** | **2.08** | |
| **CV** | **0.574** | **0.124** | **0.491** | |

Source: Annual Report of BPC, 2066/67

Table-16 of RTA represented that the contributed proportion of receivable in total assets which was between 2.04 to 7.57 times during five year period with 49.10% of CV. It indicated the company's receivable position was in favor of company. There was less risk from receivable.

***Figure16*** also represents clearly that the portion was hold by receivable on total assets & trend of receivable. Hypothesis is used at ***TABLE***-- 16.1 below to test the reality of significance on relation of trend of RTA.

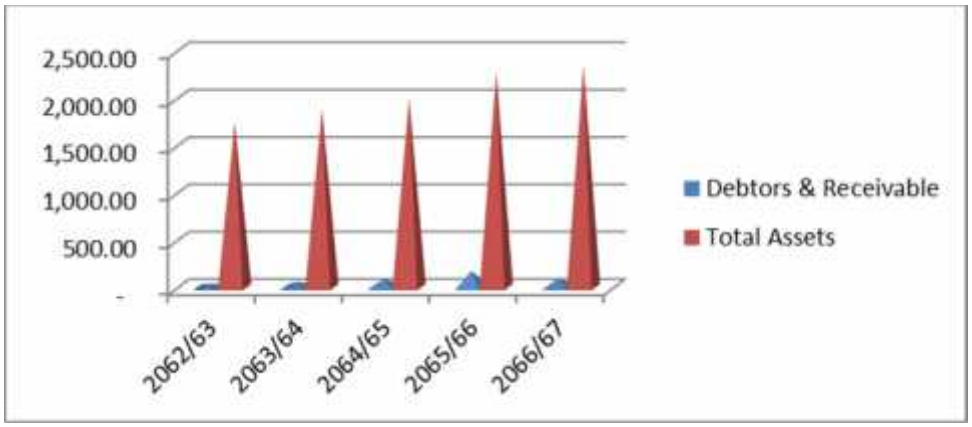



**Fig 16: Trend of ratio of Receivable to total assets of BPC**

**Testing the Hypothesis of the relationship between Receivable & Total assets**

***Hypothesis Ho6:***

There is no significant relation between Receivable & Total Assets CHPCL & BPC.

The ***TABLE***-16.1 represents the correlation coefficient of the Receivable & Total Assets, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

***TABLE*-- 16.1**

**The correlation coefficient of Receivable & Total assets, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| **RTA** | **CHPCL** | 0.3064 | 0.5575 | 3.182 | 3 | Not Significant |
| | **BPC** | 0.7782 | 2.1463 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

Here, the calculated value of "t" is lower than table value (0.5575<3.182) of CHPCL, so null hypothesis accepted. It indicates that there is no significant relation between trends of Receivable & Total Assets or receivable trend did not affect to trend of total assets.

**Result for BPC:**

Here also, the calculated value of "t" is lower than table value (0.7782<3.182) of BPC, so the null hypothesis accepted. It means there is no significant relation between trends of Receivable & Total Assets.

### G. Raito of Inventory to Current Assets (ICA)

It indicates the proportion of inventory on current assets. Large ratio indicates that the management was adopting liberal inventory policy. Large ratio indicates that the management is adopting liberal inventory policy.

### ICA of CHPCL

***TABLE-17***

***RATIO OF INVENTORY TO CURRENT ASSETS (ICA) of CHPCL***

Rs. In million

| Fiscal Year | Inventory | Current Assets | Ratio(in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 10.30 | 206.83 | 0.05 | 100.00 |
| 2063/64 | 12.09 | 241.80 | 0.05 | 100.47 |
| 2064/65 | 22.32 | 646.23 | 0.03 | 69.39 |
| 2065/66 | 36.89 | 995.07 | 0.04 | 74.48 |
| 2066/67 | 30.90 | 1,450.09 | 0.02 | 42.81 |
| **Total** | **112.51** | **3,540.03** | **0.19** | |
| **Mean value** | **22.50** | **708.01** | **0.04** | |
| **SD** | **11.57** | **525.70** | **0.01** | |
| **CV %** | **51.40** | **74.25** | **31.05** | |

Source : Annual Report of CHPCL, (2062/63 to 2066/67)

From the T**able-17 of CHPCL**, it is seen that the proportion of ICA fluctuated over the period with 31.05% CV but, there was low risk of 0.01. It indicates that the company given more emphasis to manage its inventory level which was goodness of the company.

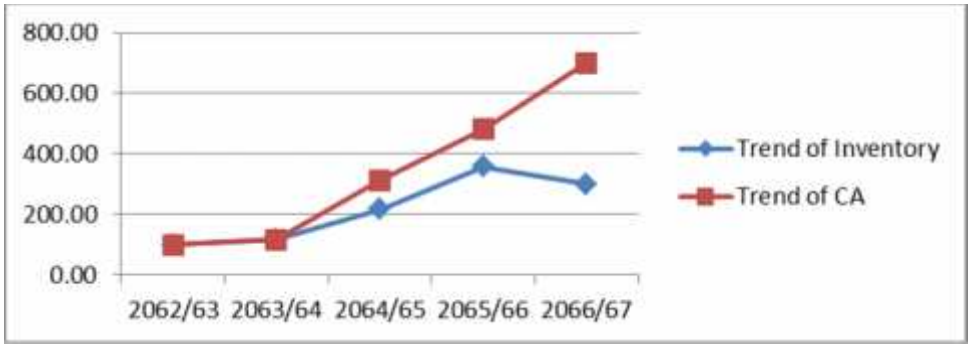



**Fig 17: Trend of ratio of Inventory to Current Assets of CHPCL**

***Figure* 17** also shows the same thing. The trend line of current assets was on upward position but in the same time the inventory level remains below 200. Hypothesis is used at ***TABLE***-- 18.1 below to test the reality of significance on relation of trend of ICA.

**ICA of BPC**

***TABLE-18***

***RATIO OF INVENTORY TO CURRENT ASSETS (ICA) of BPC***

(Rs.in million )

| Fiscal Year | Inventory | Current Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 57.62 | 524.02 | 0.11 | 100.00 |
| 2063/64 | 58.90 | 647.42 | 0.09 | 82.73 |
| 2064/65 | 74.65 | 746.14 | 0.10 | 90.98 |
| 2065/66 | 92.72 | 743.84 | 0.12 | 113.36 |
| 2066/67 | 104.54 | 651.52 | 0.16 | 145.92 |
| **Total** | **388.43** | **3,312.93** | **0.59** | |
| **Mean value** | **77.69** | **662.59** | **0.12** | |
| **SD** | **20.69** | **91.01** | **0.03** | |
| **CV** | 0.266 | 0.137 | 0.232 | |

Source : Annual Report of BPC, 2066/67

From the T**able -18 of BPC**, it is seen that the proportion of ICA fluctuated over the period with 23.2% CV with low risk of 0.03. It indicates that the BPC also given emphasis to manage its inventory level. Although the ICA of BPC is higher than CHPCL but it was in favor of company. The proportion lies between 0.09 to 0.16 times.

***Figure* 18** also shows the same thing. The change on trend line of current assets was on upward position up to 3 year period and gone downward but the trend line of inventory went upward slowly. Hypothesis is used at TABLE 18.1 below to test the reality of significance on relation of trend of ICA.

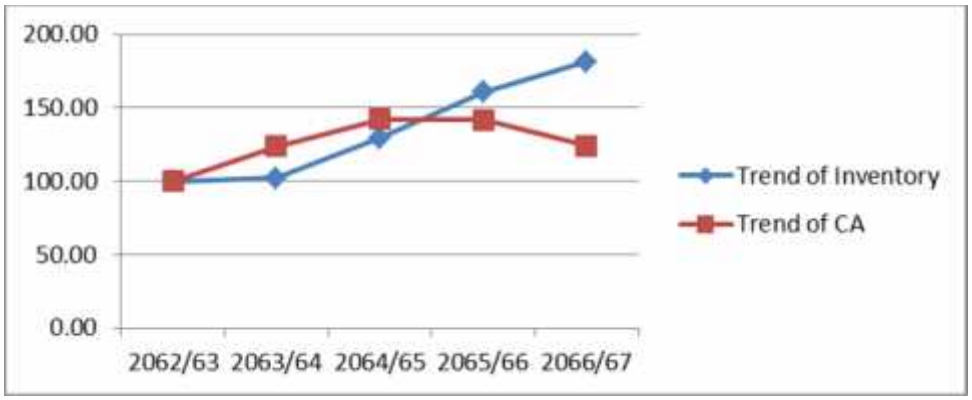



**Fig 18: Trend of ratio of Inventory to Current Assets of BPC**

**Testing the Hypothesis of the relationship between Inventory & Current assets**

***Hypothesis Ho7:***

There is no significant relation between Inventory & Current Assets CHPCL & BPC.

The TABLE 18.1 represents the correlation coefficient of the Inventory & Current Assets, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

**TABLE 18.1**

**The correlation coefficient of Inventory & current assets, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| ICA | CHPCL | 0.8777 | 3.1724 | 3.182 | 3 | Not Significant |
| | BPC | 0.4960 | 0.9894 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is lower than table value with positive correlation, so null hypothesis accepted. It means that there was no significant relationship between Inventory & Current Assets of CHPCL.

**Result for BPC:**

But in the case of BPC, the calculated value of "t" is lower than table value, so null hypothesis accepted. It indicates that there was no significant relation between trends of Inventory & Current Assets of BPC.

**H. Raito of Inventory to Total Assets (ITA)**

The percentage of ITA indicated the inventory policy followed by a company where that is liberal or stringent. Lower ratio of ITA indicates the company strict on managing of inventory & high ratio indicates the liberal policy on it.

## ITA of CHPCL

*TABLE NO :-19*

*RATIO OF INVENTORY TO TOTAL ASSETS (ITA) of CHPCL*

Rs. in Million

| Fiscal Year | Inventory | Total Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 10.30 | 2,406.79 | 0.004 | 100.00 |
| 2063/64 | 12.09 | 2,375.74 | 0.005 | 118.99 |
| 2064/65 | 22.32 | 2,865.71 | 0.008 | 182.08 |
| 2065/66 | 36.89 | 3,134.87 | 0.012 | 275.10 |
| 2066/67 | 30.90 | 3,577.42 | 0.009 | 201.92 |
| **Total** | **112.51** | **14,360.53** | **0.038** | |
| **Mean value** | **22.50** | **2,872.11** | **0.008** | |
| **SD** | **11.57** | **507.31** | **0.003** | |
| **CV %** | **51.40** | **17.66** | **39.81** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

**Table no 19 of ITA**, it is seen that the proportion of it fluctuated over the period with 39.81% CV with low risk of 0.003. It was in favor of company although the level of inventory was in increasing level.

**Figure 19** also shown the same thing through trend line i.e. the curve went upward for the initial four years and declined a little in fifth year. Hypothesis is used at TABLE 20.1 below to test the reality of significance on relation of trend of ITA.

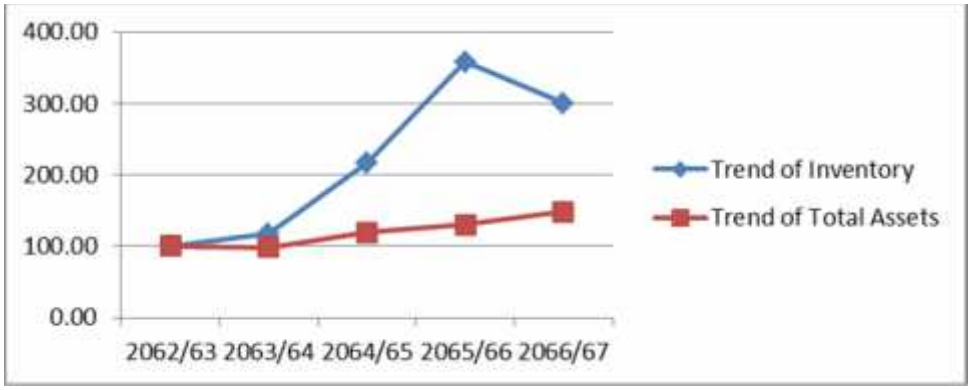



**Fig 19: Trend of ratio of Inventory to Total Assets of CHPCL**

## ITA of BPC

*TABLE NO :-20*

*RATIO OF INVENTORY TO TOTAL ASSETS (ITA) of BPC*

(Rs.in million )

| Fiscal Year | Inventory | Total Assets | Ratio (in times) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 57.62 | 1,744.45 | 0.033 | 100.00 |
| 2063/64 | 58.90 | 1,882.27 | 0.03 | 94.73 |
| 2064/65 | 74.65 | 1,991.69 | 0.04 | 113.46 |
| 2065/66 | 92.72 | 2,264.20 | 0.04 | 123.98 |
| 2066/67 | 104.54 | 2,341.44 | 0.04 | 135.17 |
| **Total** | **388.43** | **10,224.05** | **0.19** | |
| **Mean value** | **77.69** | **2,044.81** | **0.04** | |
| **SD** | **20.69** | **252.78** | **0.01** | |
| **CV** | 0.266 | 0.124 | 0.147 | |

Source : Annual Report of BPC, 2066/67

**Table -20**, it is seen that the proportion of ITA fluctuated over the period with 14.7% CV with low risk of 0.01 of BPC. It was in favor of company although the level of inventory was in increasing level.

**Figure 20** also shown the same thing through trend line i.e. the curve went downward in the first year and then upward for the left four years with little. Hypothesis is used at TABLE 20.1 below to test the reality of significance on relation of trend of ITA.

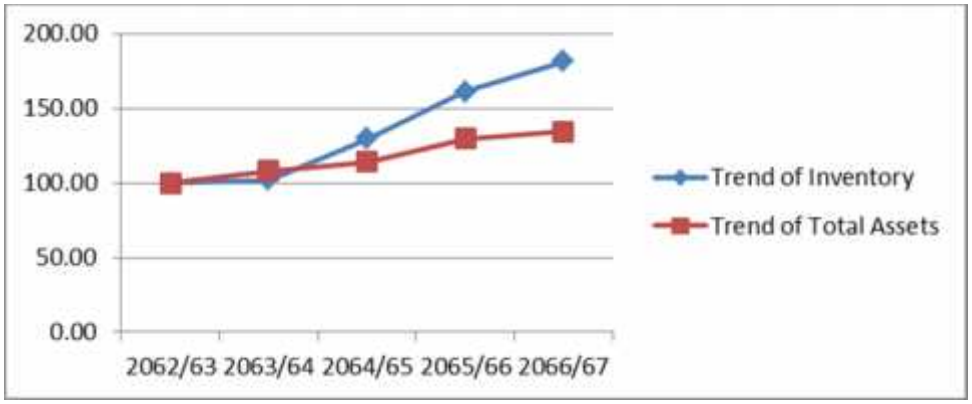



**Fig 20: Trend of ratio of Inventory to Total Assets of BPC**

**Testing the Hypothesis of the relationship between Inventory & Total assets**

***Hypothesis Ho8:***

There is no significant relation between Inventory & Total Assets CHPCL & BPC.

The TABLE 20.1 represents the correlation coefficient of the Inventory & Total Assets, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

**TABLE 20.1**

**The correlation coefficient of Inventory & Total assets, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| **ITA** | **CHPCL** | **0.8758** | **3.1429** | **3.182** | **3** | Not Significant |
| | **BPC** | **0.9803** | **8.5965** | **3.182** | **3** | Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is lower than table value, so null hypothesis accepted. It means there was no significant relation between Inventory & Total Assets of CHPCL on average.

**Result for BPC:**

But in the case of BPC, the calculated value of "t" is higher than table value, so null hypothesis rejected. It shows that there was significant relation positively between Inventory & Total Assets of BPC.

## 4.3 THE LIQUIDITY POSITION

Liquidity ratios measures the liquidity position of firm's ability to safety its short-term commitments out of current or liquid assets. These ratios focus on current assets and liabilities and are used to determine the short-term solvency position of a firm. This section introduced to liquidity position of both selected company i.e. CHPCL & BPC.

### A. Current Ratio (CR)

A current ratio is the quantitative relationship between current assets (CA) & current liabilities (CL). Here, CA is those, which can normally be converted into cash within a year. They include cash, inventories, receivables, bank balance, prepaid expenses and marketable securities and so on. On the other hand, CL refers to those obligations, which must be paid within a year. These include accounts payable, bank overdraft, notes payables, accruals and so on.

**CR of CHPCL**

***TABLE NO: 21***

***CALCULATION OF CURRENT RATIO OF CHPCL***

Rs. In million

| Fiscal Year | Total Current Assets (CA) | Current Liabilities (CL) | Current Ratio (CR) in times | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 206.83 | 327.48 | 0.63 | 100.00 |
| 2063/64 | 241.80 | 268.86 | 0.90 | 142.40 |
| 2064/65 | 646.23 | 504.09 | 1.28 | 202.98 |
| 2065/66 | 995.07 | 364.89 | 2.73 | 431.77 |
| 2066/67 | 1,450.09 | 102.70 | 14.12 | 2,235.58 |
| **Total** | **3,540.03** | **1,568.02** | **19.66** | |
| **Mean value** | **708.01** | **313.60** | **3.93** | |
| **SD** | **525.70** | **146.28** | **5.75** | |
| **CV %** | **74.25** | **46.64** | **146.30** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

**Table 21** shows that the proportion of CR was fluctuated with 146.30% CV of CHPCL. CR in the beginning of two years was lower than standard level of quick ratio i.e.1:1. But, it maintained standard level of CR i.e. 2:1 in the third to fourth year period. In the last fifth year the CR went up extremely to 14.12:1 times. It indicates that CHPCL reserved more current assets to meet short term solvency. The company has followed conservative policy in the fifth year.

The ***Figure* 21** describes the trend of CR maintained by CHPCL during five year period. We can easily see the position of CR.

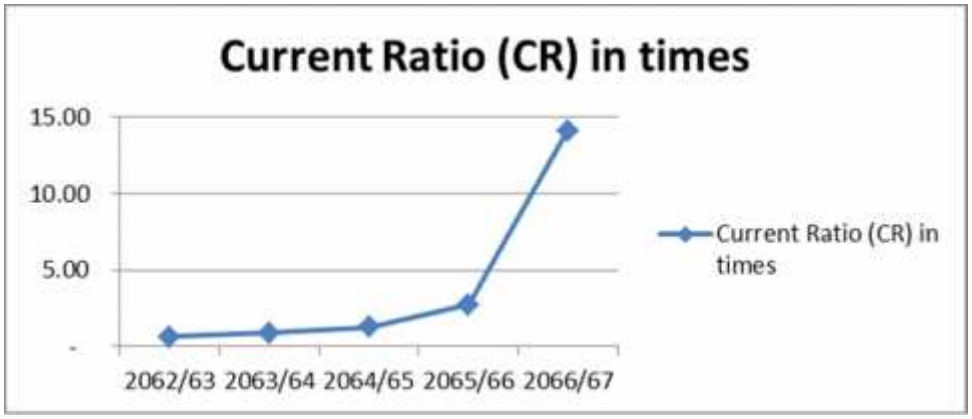



**Fig 21: Trend of ratio of Current ratio of CHPCL**

**CR of BPC**

According to ***Table -22*** the company, BPC, maintained CR from 1.18 to 1 time during five years period which is lower than standard but not bad. The variance of CR was 8.8% which was low variance and also there was no huge variance on current assets & current liability.

***TABLE NO: 22***

***CALCULATION OF CURRENT RATIO (CR) OF BPC***

Rs. In million

| Fiscal Year | Total Current Assets (CA) | Current Liabilities (CL) | Current Ratio (CR) in times | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 524.02 | 443.88 | 1.18 | 100.00 |
| 2063/64 | 647.42 | 587.41 | 1.10 | 93.36 |
| 2064/65 | 746.14 | 595.87 | 1.25 | 106.07 |
| 2065/66 | 743.84 | 691.20 | 1.08 | 91.16 |
| 2066/67 | 651.52 | 653.67 | 1.00 | 84.43 |
| **Total** | **3,312.93** | **2,972.03** | **5.61** | |
| **Mean value** | **662.59** | **594.41** | **1.12** | |
| **SD** | **91.01** | **94.33** | **0.10** | |
| **CV** | 0.137 | 0.159 | 0.088 | |

Source : Annual Report of BPC, 2066/67

The ***Figure* 22** describes the trend line of CR maintained by BPC during five year period. We can easily see the position of CR. It was happened due to decrease in cash & bank balance.

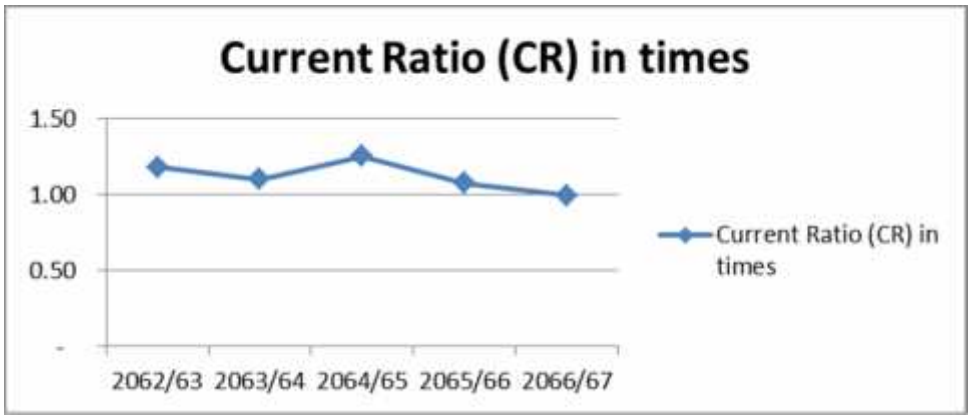



**Fig 22: Trend of ratio of Current ratio of BPC**

**B. Quick Ratio (QR)**

QR is another measure of short-term solvency of a firm. Quick ratio is defined as the quantitative relationship between Quick assets & current liabilities (CL).

**QR of CHPCL**

***TABLE NO: 23***

***CALCULATION OF QUICK RATIO (QR) OF CHPCL***

Rs. In million

| Fiscal Year | Quick Assets (CA) | Current Liabilities (CL) | Quick Ratio (QR) in times | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 196.53 | 327.48 | 0.60 | 100.00 |
| 2063/64 | 229.71 | 268.86 | 0.85 | 142.36 |
| 2064/65 | 623.91 | 504.09 | 1.24 | 206.23 |
| 2065/66 | 958.18 | 364.89 | 2.63 | 437.55 |
| 2066/67 | 1,419.19 | 102.70 | 13.82 | 2,302.56 |
| **Total** | **3,427.52** | **1,568.02** | **19.14** | |
| **Mean value** | **685.50** | **313.60** | **3.83** | |
| **SD** | **515.58** | **146.28** | **5.64** | |
| **CV %** | **75.21** | **46.64** | **147.36** | |

QA= CA-Inventories

Source : Annual Report of CHPCL, (2062/63 to 2066/67)

**Table -23** shows that there was no huge difference between CR & QR of CHPCL although QR has 147.36% CV on average during five years period. It was happened due to low level of average ratio of ICA (i.e. 4% in TABLE17). The huge portion of CA was covered by short term investment. The average liquid ratio was 3.83:1 times.

The ***Figure* 23** describes the trend of QR maintained by CHPCL during five year period.

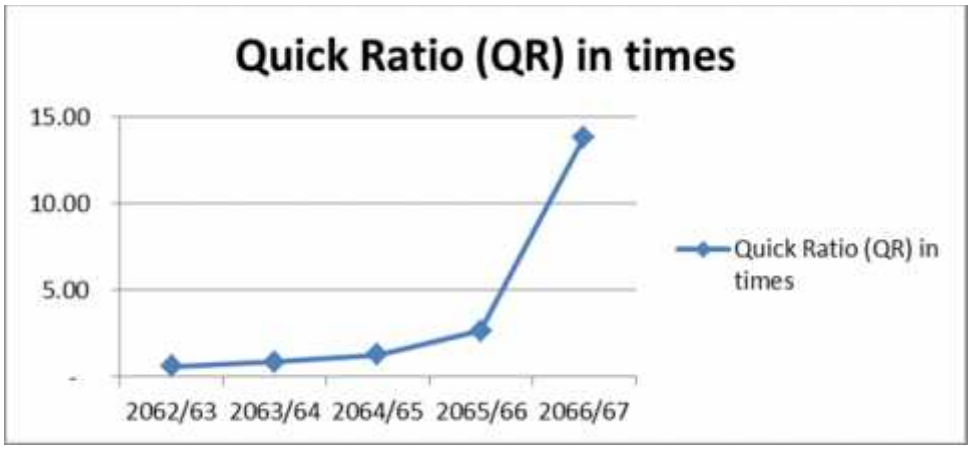



**Fig 23: Trend of ratio of Quick ratio of CHPCL**

## QR of BPC

***TABLE NO: 24***

***CALCULATION OF QUICK RATIO (QR) OF BPC***

Rs. In million

| Fiscal Year | Quick Assets (CA) | Current Liabilities (CL) | Quick Ratio (QR) in times | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 466.40 | 443.88 | 1.05 | 100.00 |
| 2063/64 | 588.52 | 587.41 | 1.00 | 95.35 |
| 2064/65 | 671.49 | 595.87 | 1.13 | 107.25 |
| 2065/66 | 651.11 | 691.20 | 0.94 | 89.65 |
| 2066/67 | 546.98 | 653.67 | 0.84 | 79.64 |
| **Total** | **2,924.50** | **2,972.03** | **4.96** | |
| **Mean value** | **584.90** | **594.41** | **0.99** | |
| **SD** | **82.73** | **94.33** | **0.11** | |
| **CV** | **0.141** | **0.159** | **0.111** | |

Source: Annual Report of BPC, 2066/67

***Table- 24*** shows that there was no huge difference between CR & QR of BPC. The CV of QR is low i.e. 11.1% on average during five years period which was sound position of liquidity i.e 0.99:1 times on average.

The ***Figure* 24** describes the trend of QR maintained by BPC during five year period.

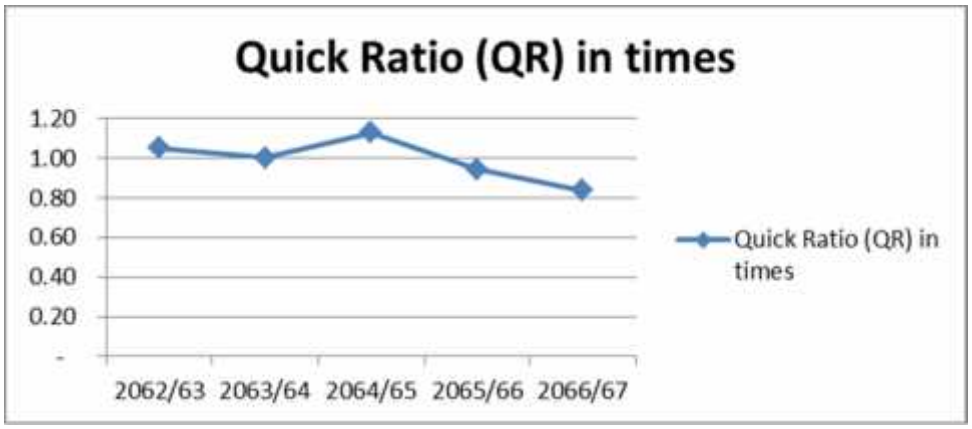



**Fig 24: Trend of ratio of Quick ratio of BPC**

## 4.4 THE PROFITABILITY POSITION

Profitability ratio are measured the profitability position of a company. It is calculated to measure the operating efficiency of the company in term of profit. Profit is the ultimate goal of any commercial firm. Here a relationship is established between Net profit with Gross & Net Working capital of both selected company i.e. CHPCL & BPC.

### A. Return on Working capital (RWC)

This ratio helps to analyze the earning power of the current assets of the company. The ratio is calculated by dividing net profit by total current assets.

## RWC of CHPCL

***TABLE NO: 25***

***CALCULATION of RETURN ON WORKING CAPITAL of CHPCL***

Rs. In million

| Fiscal Year | Net profit after tax | Working capital (CA) | RWC (in %) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 507.76 | 206.83 | 245.50 | 100.00 |
| 2063/64 | 667.48 | 241.80 | 276.04 | 112.44 |
| 2064/65 | 679.37 | 646.23 | 105.13 | 42.82 |
| 2065/66 | 735.36 | 995.07 | 73.90 | 30.10 |
| 2066/67 | 777.43 | 1,450.09 | 53.61 | 21.84 |
| **Total** | **3,367.40** | **3,540.03** | **754.18** | |
| **Mean value** | **673.48** | **708.01** | **150.84** | |
| **SD** | **102.68** | **525.70** | **102.59** | |
| **CV %** | **15.25** | **74.25** | **68.01** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

The ***Table- 25*** shows the trend of return on current assets of CHPCL during the study period. Return on current assets was positive but it was in downward trend from 3rd year to the end due to increasing level of CA. It has decreased by 191.89%. The highest profitability was 276.04% in 2063/64 year and lowest is 53.61% in 2066/67. Average return on current assets was 150.84% with 68.01 CV with high risk i.e.102.59. It shows that the company unable to meet the sufficient return on net profit although it was invested in short term investment.

***Figure25*** also represented the trend of net profit margin on current assets clearly. So, to assure on the relation, we used hypothesis at TABLE 26.1 below to test the reality of significance on relation of trend of RWC.

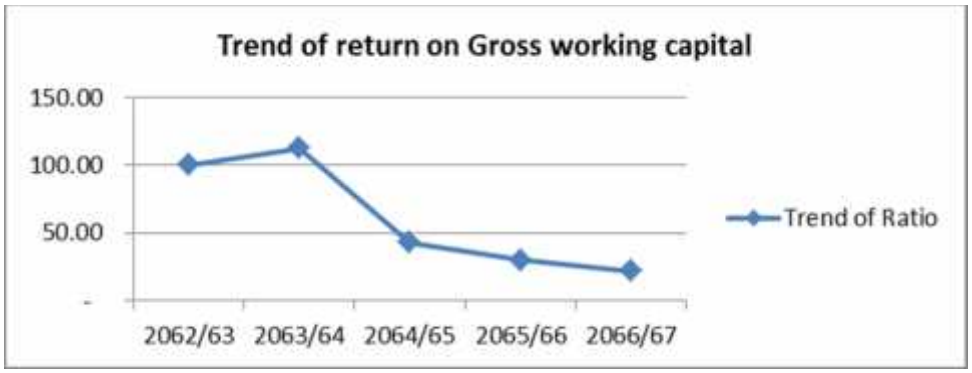



**Fig 25: Trend of return on working capital of CHPCL**

## RWC of BPC

***TABLE NO: 26***

***CALCULATION of RETURN ON WORKING CAPITAL of BPC***

Rs. In million

| Fiscal Year | Net profit after tax | Working Capital (CA) | RWC (in %) | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 288.42 | 524.02 | 55.04 | 100.00 |
| 2063/64 | 252.84 | 647.42 | 39.05 | 70.96 |
| 2064/65 | 353.88 | 746.14 | 47.43 | 86.17 |
| 2065/66 | 291.59 | 743.84 | 39.20 | 71.22 |
| 2066/67 | 224.23 | 651.52 | 34.42 | 62.53 |
| **Total** | **1,410.96** | **3,312.93** | **215.14** | |
| **Mean value** | **282.19** | **662.59** | **43.03** | |
| **SD** | **48.70** | **91.01** | **8.19** | |
| **CV** | **0.173** | **0.137** | **0.190** | |

Source : Annual Report of BPC, 2066/67

The ***Table- 26*** shows the trend of return on current assets of BPC during the study period. Return on current assets was positive but it was in fluctuated trend with CV on average 19%. It shows that BPC able to meet the positive return on net profit at an average level of 43.03%.

***Figure26*** also represented the trend of net profit margin on current assets. So, to assure on the relation, we used hypothesis at TABLE 26.1 below to test the reality of significance on relation of trend of RWC.

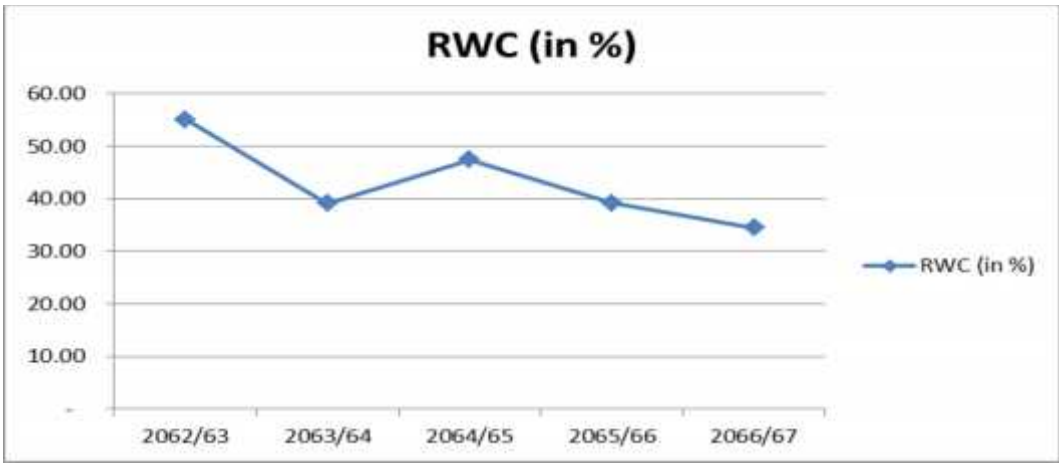



**Fig 26: Trend of return on working capital of BPC**

**Testing the Hypothesis of the relationship between Net profit & Gross working capital**

***Hypothesis $Ho_9$:***

There is no significant relation between Net profit & Gross working capital of CHPCL & BPC.

The ***Table-*** 26.1 represents the correlation coefficient of the Net profit & Gross working capital, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

**TABLE 26.1**

**The correlation coefficient of Gross working capital with Net profit, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| GWC-Profit | CHPCL | 0.8355 | 2.6337 | 3.182 | 3 | Not Significant |
| | BPC | 0.3935 | 0.7414 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is lower than table value with perfect correlation, so null hypothesis accepted. It shows that volume of working capital did not affect to net profit of CHPCL.

**Result for BPC:**

In the case of BPC, also the calculated "t" value is lower than table value, so null hypothesis accepted. It shows that volume of working capital did not affect to net profit of BPC.

**C. Liquidity Vs Profitability**

This section attempts the relationship between ratio of liquidity & profitability with the help of using hypothesis.

**Testing the hypothesis between gross profit margin and current ratio**

***Hypothesis $Ho_{10}$:***

*There is no significant relation between Gross profit margin & Current ratio of CHPCL & BPC.*

The TABLE 26.2 represents the correlation coefficient of the Gross profit margin & Current ratio, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

**TABLE 26.2**

**The correlation coefficient of Gross profit margin & Current ratio, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| Gross profit margin & CR | CHPCL | -0.7942 | 2.2638 | 3.182 | 3 | Not Significant |
| | BPC | 0.6861 | 1.6335 | 3.182 | 3 | Not Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is less than table value with perfect negative correlation of CHPCL, so null hypothesis accepted. It shows that there was no significance relationship between them. Increment in CR was the main cause negative correlation.

**Result for BPC:**

For BPC, also the calculated "t" value is lower than table value, so null hypothesis accepted. It shows there was no significance relationship between Gross profit margin & current ratio.

**Testing the hypothesis between Net profit margin and current ratio**

***Hypothesis $Ho_{11}$:***

*There is no significant relation between Net profit margin & Current ratio of CHPCL & BPC.*

The ***Table-***26.3 represents the correlation coefficient of the Net profit margin & Current ratio, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

**TABLE 26.3**

**The correlation coefficient of Net profit margin & Current ratio, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| Net profit margin & CR | CHPCL | 0.6936 | 1.6678 | 3.182 | 3 | Not Significant |
| | BPC | 0.9670 | 6.5742 | 3.182 | 3 | Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" value is lower than table value, so null hypothesis accepted. It indicates that there was no significance relationship between Net profit margin & Current ratio of CHPCL.

**Result for BPC:**

In case of BPC, the calculated "t" value is higher than table value, so null hypothesis rejected. It indicates that there was significant relation relationship between Net profit margin & Current ratio.

**Testing the hypothesis between ratio of net profit to total asset with quick ratio**

***Hypothesis*** $Ho_{12}$***:***

*There is no significant relation between Net profit to total assets & Quick ratio of CHPCL & BPC.*

The ***Table-*** 26.4 represents the correlation coefficient of the Net profit to total assets & Quick ratio, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

**TABLE 26.4**

**The correlation coefficient of Net profit to total assets & Quick ratio, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| Net profit to total assets & Quick ratio | CHPCL | -0.3895 | 0.7325 | 3.182 | 3 | Not Significant |
| | BPC | 0.9814 | 8.8548 | 3.182 | 3 | Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is less than table value, so null hypothesis accepted. It shows that there was no significance relationship between Net profits to total assets with Quick ratio. Negative Correlation also reflected that facts.

**Result for BPC:**

The calculated "t" value is higher than table value, so null hypothesis rejected. It shows that there was significant relationship between net profits to total assets margin with Quick ratio. It means quick ratio affected to margin of net profit to total assets.

**Testing the hypothesis between Return on Shareholder's equity and quick ratio**

***Hypothesis $Ho_{13}$:***

*There is no significant relation between Return on Shareholder's equity & Quick ratio of CHPCL & BPC.*

The ***Table-*** 26.5 represents the correlation coefficient of Return on shareholder's equity & Quick ratio, then test them using student's t-test value at 5% level of significance with 3=(5-2) degree of freedom.

**TABLE 26.5**

**The correlation coefficient of Return on shareholder's equity & Quick ratio, calculated student's t-value & table value**

| Ratio | Company | r | Calculated t-value | Table t-value | d.f. (n-2)=3 | Result |
|---|---|---|---|---|---|---|
| Return on Shareholder's equity & QR | CHPCL | 0.6484 | 1.4752 | 3.182 | 3 | Not Significant |
| | BPC | 0.8831 | 3.2602 | 3.182 | 3 | Significant |

**Source: Appendix-3**

**Result for CHPCL:**

The calculated value of "t" is less than table value, so null hypothesis accepted. It shows that there was no significant relationship between Return on shareholder's equity & quick ratio. It means quick ratio did not affected to Shareholders equity during the study period.

**Result for BPC:**

Like this way, the calculated value of "t" is just higher than table value, so null hypothesis rejected. It shows that there was significant relationship between Return on shareholder's equity & quick ratio. It means quick ratio of BPC affected to Shareholders equity during the study period.

## 4.5 EFFICIENCY OF WORKING CAPITAL

Funds are invested on various assets in a company to make sales and earn profits. The efficiency with which assets are managed, directly affects the volume of sales. High proportion of current assets indicates company's high degree of liquidation

position but they may not achieve the desired profitability. This situation is seen in the efficiency of working capital of both selected company. Hence, Turnover ratios were calculated as per below to measure the efficiency of working capital.

### A. Inventory turnover ratio (ITR)

One of the important measures of efficiency of working capital management is the inventory turnover ratio which indicates how frequently inventory moved in-out of an enterprise during a period of time. It is suggested that the higher the ratio, the larger the amount of profit due to the small amount of working capital tied up in inventory.

### ITR of CHPCL

***TABLE NO: 29***

***CALCULATION INVENTORY TURNOVER RATIO (ITR) of CHPCL***

Rs. In million

| Fiscal Year | Sales | Inventory | ITR in times | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 819.41 | 10.30 | 79.58 | 100.00 |
| 2063/64 | 903.54 | 12.09 | 74.71 | 93.88 |
| 2064/65 | 870.01 | 22.32 | 38.98 | 48.97 |
| 2065/66 | 883.45 | 36.89 | 23.95 | 30.09 |
| 2066/67 | 886.56 | 30.90 | 28.69 | 36.05 |
| **Total** | **4,362.98** | **112.51** | **245.91** | |
| **Mean value** | **872.60** | **22.50** | **49.18** | |
| **SD** | **32.04** | **11.57** | **26.16** | |
| **CV %** | **3.67** | **51.40** | **53.19** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

The ***Table-29*** represents ***the inventory turnover ratio (ITR)*** of CHPCL for the study period. There was low variance in sales i.e. 3.67% but huge variance represented in inventory i.e. 51.40% and ITR went to downwards. But, there was

not direct relationship of sales with inventory because the company sold energy and it was not storable.

***Figure 29*** represents the above trend. During first four year i.e. 2062/63 to 2065/66, the trend line went to downward and increased in 2066/67.


**Fig 29: Trend of Inventory turnover ratio of CHPCL**

## ITR of BPC

***TABLE NO: 30***

***CALCULATION INVENTORY TURNOVER RATIO (ITR) of BPC***

Rs. In million

| Fiscal Year | Sales | Inventory | ITR in times | Trend of Ratio |
|---|---|---|---|---|
| 2062/63 | 358.42 | 57.62 | 6.22 | 100.00 |
| 2063/64 | 379.77 | 58.90 | 6.45 | 103.67 |
| 2064/65 | 421.69 | 74.65 | 5.65 | 90.82 |
| 2065/66 | 430.80 | 92.72 | 4.65 | 74.70 |
| 2066/67 | 453.43 | 104.54 | 4.34 | 69.73 |
| **Total** | **2,044.11** | **388.43** | **27.30** | |
| **Mean value** | **408.82** | **77.69** | **5.46** | |
| **SD** | **38.80** | **20.69** | **0.94** | |
| **CV** | **0.095** | **0.266** | **0.172** | |

Source : Annual Report of BPC, 2066/67

The ***Table-30*** represents ***the inventory turnover ratio (ITR)*** of BPC for the study period. There was low variance in the trend of sales i.e. 9.5% and 2.66% in inventory. But, there was no direct relationship of sales with inventory because the company sold energy and it was not storable.

***Figure 30*** represents the above trend. ITR in the first & second year grown up & then fall down.

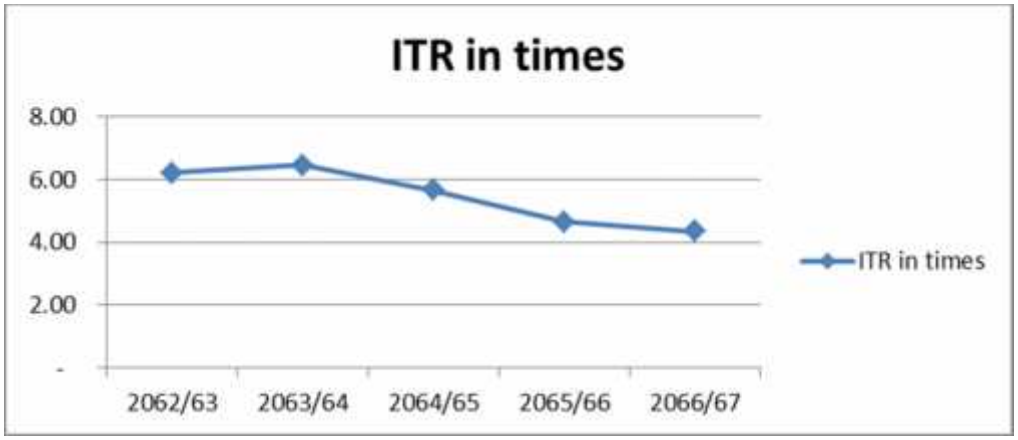



**Fig 30: Trend of Inventory turnover ratio of BPC**

**B. Debtors turnover ratio (DTR)**

Another important measure of efficiency of working capital management is debtors' turnover ratio which indicates the efficiency with which debtors are being utilized in the enterprise. This ratio is expressed in the number of times the debtors turned over during a period. It is, therefore, the higher the ratio, the more efficient is the management of debtors. However, the ratio should be carefully interpreted as high ratio could be achieved through strict decision polling. The debtors turnover ratio of the both company (CHPCL & BPC) during period of study 2062/63 to 2066/67 has been presented in the ***Table*- 31 & 32.**

## DTR of CHPCL

***TABLE NO: 31***

***CALCULATION DEBTORS (RECEIVABLE) TURNOVER RATIO (DTR) of CHPCL***

Rs. In million

| Fiscal Year | Sales | Receivable | Debtors TR (DTR) in times | Trend of Ratio | DSO |
|---|---|---|---|---|---|
| 2062/63 | 819.41 | 119.79 | 6.84 | 100.00 | 52.63 |
| 2063/64 | 903.54 | 183.96 | 4.91 | 71.80 | 73.30 |
| 2064/65 | 870.01 | 189.69 | 4.59 | 67.05 | 78.49 |
| 2065/66 | 883.45 | 108.66 | 8.13 | 118.87 | 44.28 |
| 2066/67 | 886.56 | 209.48 | 4.23 | 61.87 | 85.06 |
| **Total** | **4,362.98** | **811.58** | **28.70** | | |
| **Mean value** | **872.60** | **162.32** | **5.74** | | **66.75** |
| **SD** | **32.04** | **45.08** | **1.67** | | |
| **CV %** | **3.67** | **27.78** | **29.17** | | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

The ***Table-31*** shows the trend of DTR of CHPCL which was fluctuated 5.74 times on average with coefficient of variance 29.17%. It was in fluctuating between 4.23 to 8.13 times. The proportion of sales vibrated with 3.67% & receivable with 27.78% CV. It indicated that fluctuation on receivable was more than sales. High proportion of DTR was favorable to the company i.e. 8.13 times in 2065/66 but except 2062/63 the ratio went downward position each year which was not favorable. DSO also represented the trend of receivable. When DTR was in increase position, DSO was in decreased and vice-versa. DSO was fluctuated from minimum 44.28 to maximum 85.06 days with average DSO 66.75 days. It indicated that the company received its receivable within 66.75 days and according to power purchase agreement with NEA also disclosed that NEA paid its payable within 2 month. So, observing the overall position of DTR & DSO was

in middle because its receivable period totally depended up on financial health of NEA.

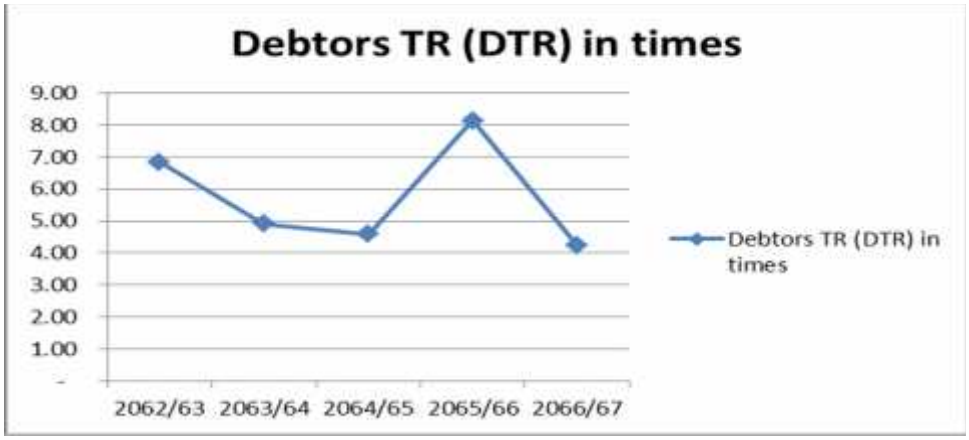



**Fig 31: Trend of Debtors turnover ratio of CHPCL**

The trend line, ***Figure*31,** of DTR also represented the same trend of CHPCL.

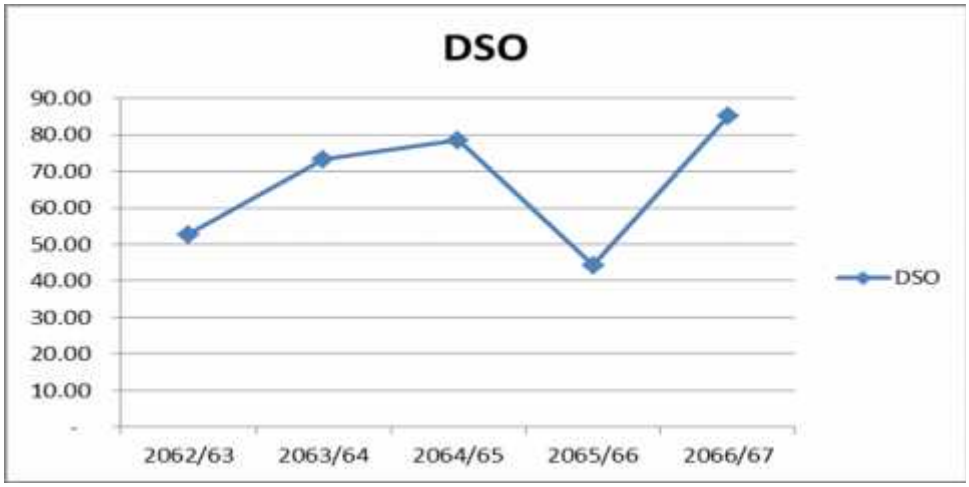



**Fig 32: Trend of Debtors sales outstanding ratio of CHPCL**

Regarding ***Figure-32*** the trend line indicated that amount of receivable in the 2062/63 to 064/65 went upward position but in fourth year i.e. 2065/66 proportion of receivable went downward and again at the last year it went up due to fluctuated position of DTR.

## DTR of BPC

***TABLE NO: 32***

***CALCULATION DEBTORS (RECEIVABLE) TURNOVER RATIO (DTR) of BPC***

Rs. In million

| Fiscal Year | Sales | Receivable | Debtors TR (DTR) in times | Trend of Ratio | DSO |
|---|---|---|---|---|---|
| 2062/63 | 358.42 | 35.51 | 10.09 | 100.00 | 35.67 |
| 2063/64 | 379.77 | 58.92 | 6.45 | 63.86 | 55.85 |
| 2064/65 | 421.69 | 88.41 | 4.77 | 47.26 | 75.47 |
| 2065/66 | 430.80 | 171.36 | 2.51 | 24.91 | 143.20 |
| 2066/67 | 453.43 | 93.69 | 4.84 | 47.95 | 74.38 |
| **Total** | **2,044.11** | **447.89** | **28.66** | | **384.57** |
| **Mean value** | **408.82** | **89.58** | **5.73** | | **76.91** |
| **SD** | **38.80** | **51.40** | **2.81** | | |
| **CV** | 0.095 | 0.574 | 0.490 | | |

Source: Annual Report of BPC, 2066/67

The ***Table-32*** shows DTR trend of BPC. The ratio of DTR fluctuated with 49% CV. It was fluctuated between 10.09 to 2.51times. The proportion of sales fluctuated with 9.5% & receivable with 57.4% CV. It indicated that fluctuation on receivable was more than sales. High proportion of DTR was favorable to the company i.e. 10.09 times in 2062/63 but except that ratio went downward position each year which was not favorable. In 2065/66 the DTR went to extreme position i.e. 2.51 times so the DSO for that period raised up to 143.20 days. When DTR was in increase position, DSO was in decreased and vice-versa. DSO was fluctuated from minimum 35.67 days to maximum 143.20 days with average DSO 76.91 days. It indicated that the company received its receivable within 76.91 days. Although the power purchase agreement with NEA disclosed that it paid its

payable within 2 month, DSO in 2062/63 & 2063/64 was below 60 days. It was happened due to BPC sold its some energy to other consumer. So, observing the overall position of DTR & DSO was in middle because its receivable period totally depended up on financial health of NEA.

***Figure*-33** represented the same thing which was interpreted on table no 32 of BPC.

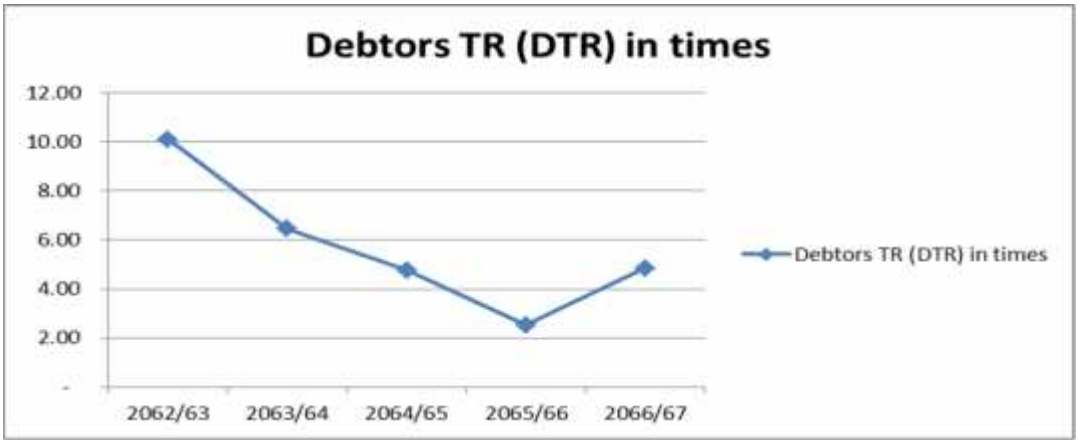



**Fig 33: Trend of Debtors turnover ratio of BPC**

Regarding ***Figure -34*** the trend line indicated that DSO in the 2062/63 to 065/66 went upward position & went downward at the last year i.e.2066/67.

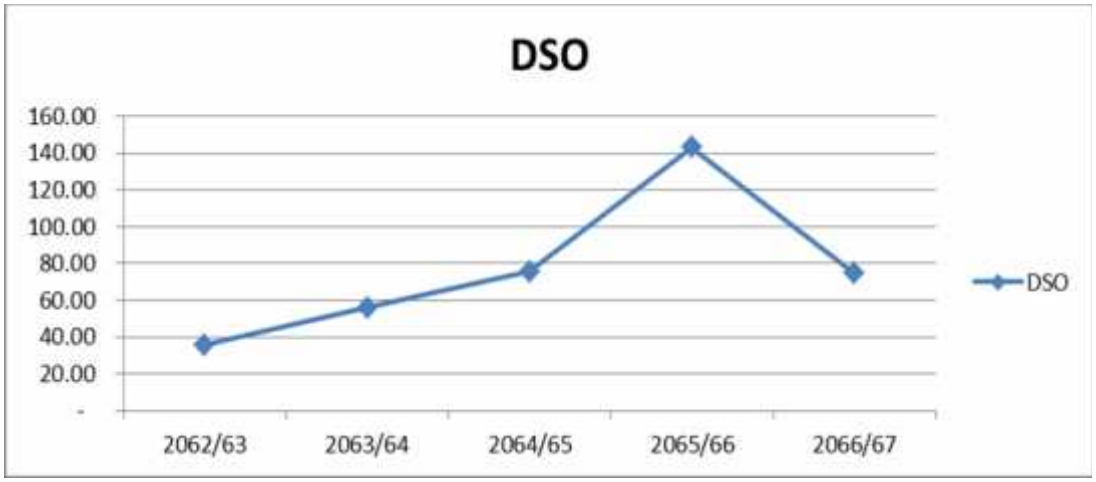



**Fig 34: Trend of Debtors sales outstanding ratio of BPC**

## C. Cash turnover ratio (CTR)

Although, cash has the smallest size in the total working capital of any company which is in most liquid form, it manages as efficiently as receivables or inventory. The relationship between net sales (operating income) and cash balance reflects the efficiency of management in utilizing of absolute liquid assets. In order to measure the efficiency of cash management, cash turnover ratio is usually employed which indicated the velocity of cash in and out of the company. It is suggested that the higher ratio measures greater efficiency of cash management, or vice versa.

## CTR of CHPCL

***TABLE NO:33***

***CALCULATION of CASH TURNOVER RATIO (CTR) of CHPCL***

Rs. In million

| Fiscal Year | Net Sales | Cash | CTR (in times) | Trend of CTR |
|---|---|---|---|---|
| 2062/63 | 778.39 | 64.25 | 12.12 | 100.00 |
| 2063/64 | 849.45 | 34.23 | 24.82 | 204.84 |
| 2064/65 | 807.73 | 277.11 | 2.91 | 24.06 |
| 2065/66 | 825.31 | 248.47 | 3.32 | 27.42 |
| 2066/67 | 813.83 | 44.13 | 18.44 | 152.22 |
| **Total** | **4,074.72** | **668.19** | **61.61** | |
| **Mean value** | **814.94** | **133.64** | **12.32** | |
| **SD** | **25.92** | **118.83** | **9.53** | |
| **CV %** | **3.18** | **88.92** | **77.32** | |

Source : Annual Report of CHPCL, (2062/63 to 2066/67)

The ***Table-33*** of CHPCL shows that, during the period, the ratio showed a fluctuating trend having a variance between 24.82 times in 2063/64 & 2.91 times in 2064/65. The average cash turnover ratio was 12.32 times and coefficient of variance was 77.32%. This shows the ratio of net sales to cash was increasing level for previous two year i.e 2062/63 & 2063/64 from 12.12 to 24.82 times but

in the period of 2064/65 the ratio was falls own rapidly to 2.91 times. At the end of period 2065/66 CTR raised slowly to 3.32 and upward hugely in 2066/67 at 18.44 times. The average turnover during five year period was 12.32 times with 77.32% variance which has seen very high.

The ***Figure 35*** shows that cash turnover ratio fluctuated every year heavily except the period between 2064/65 to 2065/66.

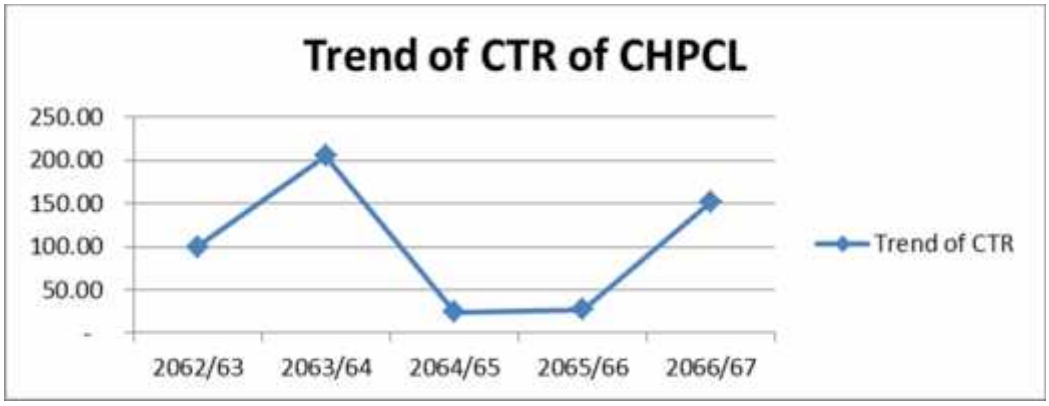



**Fig 35: Trend of Cash turnover ratio of CHPCL**

**CTR of BPC**

***TABLE NO:***

***CALCULATION of CASH TURNOVER RATIO (CTR) of BPC***

Rs. In million

| Fiscal Year | Net Sales | Cash | CTR (in times) | Trend of CTR |
|---|---|---|---|---|
| 2062/63 | 269.65 | 364.37 | 0.74 | 100.00 |
| 2063/64 | 271.90 | 457.04 | 0.59 | 80.39 |
| 2064/65 | 290.75 | 412.64 | 0.70 | 95.21 |
| 2065/66 | 293.61 | 291.69 | 1.01 | 136.02 |
| 2066/67 | 259.83 | 234.89 | 1.11 | 149.48 |
| **Total** | **1,385.73** | **1,760.62** | **4.15** | |
| **Mean value** | **277.15** | **352.12** | **0.83** | |
| **SD** | **14.49** | **89.74** | **0.22** | |
| **CV** | **0.052** | **0.255** | **0.260** | |

Source: Annual Report of BPC, 2066/67

Net Sales = Total energy sales-Generation exp-Distribution exp

The ***Table- 34*** of BPC shows that, during the period, the ratio showed less fluctuating trend in comparison with CHPCL. Having a variance of 26% it was fluctuated between 0.59 times in 2063/64 to 1.11 times in 2066/67. The average cash turnover ratio was 4.15 times.

The ***Figure 36*** shows that cash turnover ratio declined in previous two year and went upward from 2064/65 to end of study period.

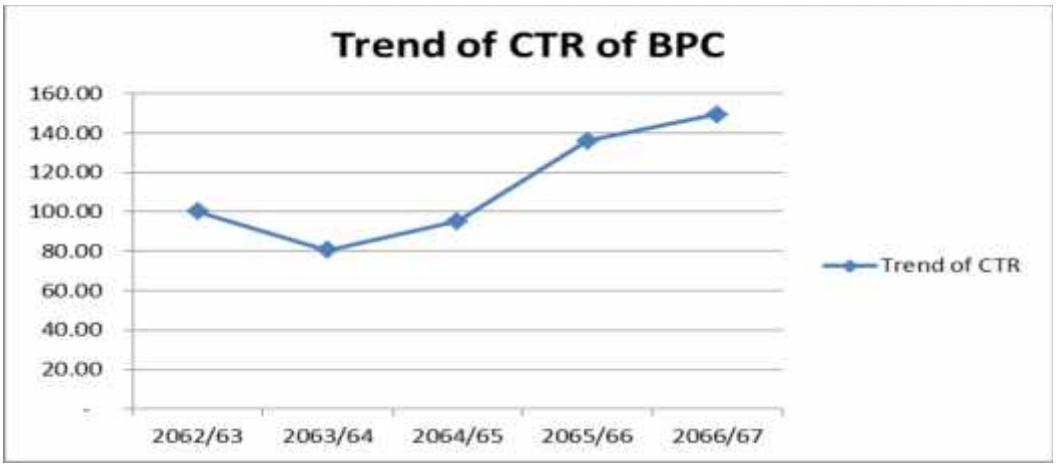



**Fig 36: Trend of Cash turnover ratio of BPC**

**D. Current Assets turnover ratio (CATR)**

The overall efficiency of working capital management of enterprises can be measured by current assets turnover ratio which indicates how efficiently the short term funds have been employed by enterprises for maximizing profitability with a given level of risk. The higher working capital turnover ratio indicates the lower the investment in short term funds and hence, greater the profit. However, care must be taken while interpreting the ratio because a very high ratio may also mean insufficient working capital funds for a given volume of company. So, a lower ratio should clearly be taken to mean that capital is not sufficiently active.

## CATR of CHPCL

***TABLE NO: 35***

***CALCULATION of CURRENT ASSETS TURNOVER RATIO (CATR) of CHPCL***

Rs. In million

| Fiscal Year | Sales | Current Assets | CATR (in times) | Trend |
|---|---|---|---|---|
| 2062/63 | 819.41 | 206.83 | 3.96 | 100.00 |
| 2063/64 | 903.54 | 241.80 | 3.74 | 94.32 |
| 2064/65 | 870.01 | 646.23 | 1.35 | 33.98 |
| 2065/66 | 883.45 | 995.07 | 0.89 | 22.41 |
| 2066/67 | 886.56 | 1,450.09 | 0.61 | 15.43 |
| **Total** | **4,362.98** | **3,540.03** | **10.54** | |
| **Mean value** | **872.60** | **708.01** | **2.11** | |
| **SD** | **32.04** | **525.70** | **1.61** | |
| **CV %** | **3.67** | **74.25** | **76.46** | |

Source: Annual Report of CHPCL, (2062/63 to 2066/67)

The ***Table-35*** shows the relationship between current assets & sales of CHPCL. The volume of sales was less than current assets from the period of 2065/66 and the ratio was in downward position with variance of 76.46%. It shows the volume of working capital was in increasing trend. It was not suitable to company to hold higher current assets than sales. It effected to its profitability according to ***Figure25.***

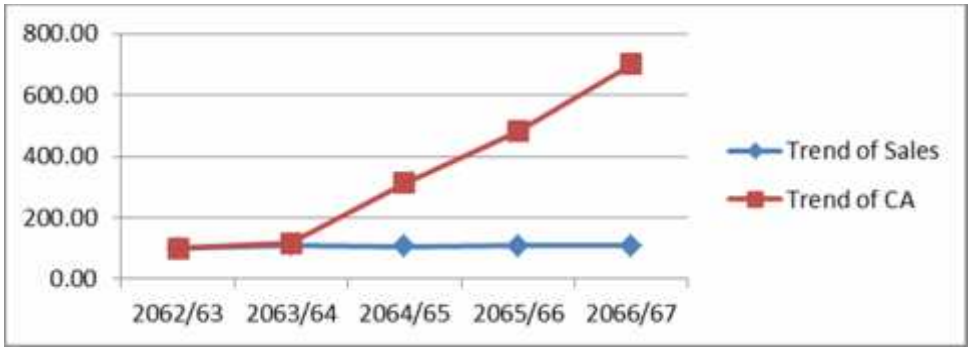



**Fig 37: Trend of Current assets turnover ratio of CHPCL.**

According to ***Figure 37*** the trend line of current assets went upward in comparison with sales. It also indicates that the company invested its fund in current assets so it affected its profitability.

## CATR of BPC

***TABLE NO: 36***

***CALCULATION of CURRENT ASSETS TURNOVER RATIO (CATR) of BPC***

Rs. In million

| Fiscal Year | Sales | Current Assets | CATR (in times) | Trend |
|---|---|---|---|---|
| 2062/63 | 358.42 | 524.02 | 0.68 | 100.00 |
| 2063/64 | 379.77 | 647.42 | 0.59 | 85.76 |
| 2064/65 | 421.69 | 746.14 | 0.57 | 82.63 |
| 2065/66 | 430.80 | 743.84 | 0.58 | 84.68 |
| 2066/67 | 453.43 | 651.52 | 0.70 | 101.75 |
| **Total** | **2,044.11** | **3,312.93** | **3.11** | |
| **Mean value** | **408.82** | **662.59** | **0.62** | |
| **SD** | **38.80** | **91.01** | **0.06** | |
| **CV** | **0.095** | **0.137** | **0.100** | |

Source : Annual Report of BPC, 2066/67

The ***Table-36*** shows the relationship between current assets & sales of BPC. The volume of sales was less than current assets every year in declining ratio. But the coefficient of variance was in minimum level i.e.10% in comparison with CHPCL. It shows the volume of working capital was in increasing trend. It shows that the company invested its property to current assets instead of long term investment. It effected to its profitability according to ***Figure26.***

According to ***Figure 38*** the level of trend line of current assets was lying upward postion in comparison of sales.

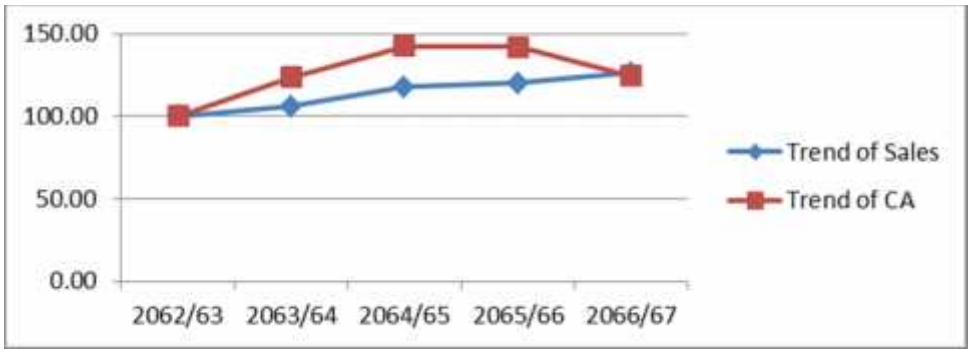



**Fig 38: Trend of Current assets turnover ratio of BPC**

# CHAPTER–V

# Summary, Conclusions & Recommendations

## 5.1 SUMMARY

This study mainly aims to identify the existing situations & to analyze the relation between different variables of working capital for the study period of CHPCL & BPC. To fulfill the main object, some specific objectives are 1) to determine the structure of W/C 2) to assess the composition of working capital 3) to access the relationship between variables on composition of working capital 4) to assess the liquidity position 5) to measure the profitability position 6) to access the relationship between working capital & profitability 7) to assess the efficiency of working capital & 8) to assess the policies and practice for managing working capital in Chilime Hydropower Company Limited (CHPCL) & Butwal Power Company Limited(BPC).

This study focuses on need & practice of working capital management system on Hydropower Company by sampling of two Company who played importance role in generation of electricity.

Similarly, this study focused to evaluate the financial performance indicator using different ratios in respect of WCM. This study has done using the past five years, (F/Y-2062/63 to 2066/67 B.S.), secondary published data of CHPCL & BPC out of sample of 22 privet & public hydropower company.

The study has been organized into five chapters, each devoted to some aspects of the study of working capital management for both companies. Introduction, Review of literature, Research methodology, presentation & analysis of data and

at the end conclude by summary, conclusion & recommendation as per analysis of data.

Working capital management (WCM) is the management of short-term financing requirements of a firm. This includes maintaining optimum balance of working capital components – receivables, inventory and payables – and using the cash efficiently for day-to-day operations. Optimization of working capital balance means minimizing the working capital requirements and realizing maximum possible revenues. Efficient WCM increases firms' free cash flow, which in turn increases the firms' growth opportunities and return to shareholders. Even though firms traditionally are focused on long term capital budgeting and capital structure, the recent trend is that many companies across different industries focus on WCM efficiency. There are mainly two concept of working capital. One is gross concepts & another is net concepts of working capital. The gross working capital is the capital invested in total current assets such as cash, marketable securities, receivables and inventories. The concept of gross working capital is important to decide the amount needed for each items of current assets. However, the gross working capital concept does not mention how they are financed. It also does not indicate the firm's liquidity correctly because it does not compare current assets with current liabilities of the firm. Net working capital can be positive or negative. A positive net working capital will arise when current assets exceed current liabilities a negative net working capital occurs when current liabilities are in excess of current assets. Managing the working capital is a day to day activity that ensures the firms has sufficient resources to continue its operations and avoid costly interruptions. Both excessive and insufficient level of working capital is not desirable from the view point of shareholders' wealth maximization goal.

Working capital policy involves two key issues: current assets investment policy and current assets financing policy. A firm's working capital policy may be

classified as (a) Aggressive Policy (b) Conservative Policy (c) Moderate Policy. Aggressive policy maintains lower ratio of current assets to total sales to minimize investment in current assets. The conservative policy finances most part of expected fund requirements with long-term funds, while short-term funds are reserved for use in the event of emergency. Moderate policy lies between aggressive policy and conservative policy. Inventory Management, receivable management also a key factors of working capital management.

To know in deep about working capital management system & practice in Nepalese prospective, review of journal, article & past research study has been studied for effective study & presentation.

To achieve the objectives, this study followed the historical research design, because the data of research was based on past performance. The process of research was conducted by collection of information from secondary sources, tabulated that and analyzed them using various financial ratio & statistical tools (Mean, Standard deviation, Coefficient of variance, correlation coefficient) & used of hypothesis testing with student's t-test to measure significance on relation of different variable.

On the basis of preceding chapter, some conclusions and recommendations have been derived:

## 5.2 CONCLUSIONS

By the help of descriptive & analytical study on the basis of past years' data of CHPCL & BPC, the researcher derived some conclusions. These following conclusions covered the core object of the study i.e. to identify the existing

situations & analyze the relationship between different variables of working capital for the past five year's period (2062/63-2066/67) of CHPCL & BPC.

***Structure & composition of Working Capital:***

- **Structure of working capital:** On an average, the structure of working capital was stronger of BPC on comparison to CHPCL. It maintained 33 percentages of total assets & CHPCL maintained 23 percentages. Although at the last two year CHPCL progressed on it but there was high level of variance i.e 60.50% due to strategy adopted for short term investment.
- **CAT:** Current assets affected to total assets of CHPCL whenever BPC's total assets did not affected by current assets.
- **CFA:** The trends of Current assets affected to fixed assets with perfect negative correlation. It means when current assets increased then fixed assets decreased, it may be noticed that BPC had sound working capital position in compare to CHPCL.

  But, Current Assets of BPC did not affected to Fixed Assets during study period.
- **CCC:** It shows that there was no significant relationship between the trend of Cash & other with Current Assets of CHPCL because the proportion of cash was only 19 percent on average during the period & it fluctuating heavily. Whenever, the trend of current assets did not affected by cash of BPC during the period.
- **CTA:** The trend of Cash did not affect to the trend of Total assets of CHPCL and same trend happened for BPC.
- **RCA:** The trend of receivable did not affect the trend of current assets during the period for both companies it was happened due to power purchase agreement with NEA which brought on average DSO to CHPCL of 66.75 days & 76.91 days for BPC.

- **RTA:** The trend of receivable did not affect to trend of total assets of CHPCL as well as for BPC. It indicates that both companies should give some response for collection of debtors.

- **ICA**: Both company maintained minimum level of inventory. So, the level of inventory did not affect to current assets during study period. Both company followed strict policy for inventory management.

***Liquidity position:***

- **CR & QR**:Both company performed stronger liquidity position as Current ratio & Quick ratio. But in comparison, CHPCL was stronger than BPC in current ratio position but in quick ratio, BPC was better than CHPCL because BPC's working capital structure covered 53 times of CA in the form of cash & bank balance whenever CHPCL only covered 23 times.

***Profitability position:***

- **GWC Vs. Net Profit:** The volume of working capital did not affect to net profit for both hydropower company, but it may be negative effect by working capital in future because the trend of net profit with W/C was in deceasing level.
- **GPM Vs. CR:** There was no significance relationship between Gross profit margin & CR for both company during study period. But in future increment position of CR should affect to gross profit with negative impact.
- **NPM vs. CR:** There was no significance relationship between Net profit margin & Current ratio of CHPCL. But in another analysis CR affected during the period to net profit margin with perfect positive relation for BPC.
- **Net profit to total assets with QR:** The trend of QR did not affect to Net profits to total assets for the study period of CHPCL but they have negative correlation. So, CHPCL should maintain standard level of QR. But in the case of BPC, QR affected during the period.

- **Return on Shareholder's equity and quick ratio:** There was no significant relationship between Return on shareholder's equity & quick ratio in CHPCL. Whenever, BPC's Shareholders equity affected by QR during the study period.

***Efficiency of W/C:***

- Efficiency of working was sound position in CHPCL than BPC during study period. Both Hydropower Company had sound position for efficiency of working capital on ITR, CTR & CART. But they should improve receivable turnover position.

***Policy adopted for managing of working capital:***

- During research study, informal interview was held with responsible person of both company & they said that they did not follow formal policy to manage its working capital position. It shows that they were focused for accounting system & neglected to working capital management practice.

## 5.3 RECOMMENDATIONS

After completing the research entitled "A study on working capital management of Chilime Hydropower Company & Butwal power company" and presenting, analyzing, concluding the data and related topics, some recommendations are presented below for the future propose:

***for Chilime Hydropower Company Limited:***

- It should try to maintain their liquidity position of CR & QR up to 2:1 & 1:1 respectively because very high & low level of ratio is not favor of company. They should consider formal working capital policy as like accounting standard.
- It is suggested that make effective counseling for collection in time because receivable position totally depend up on the financial position of NEA.

Although NEA paid within 66.75 days of its payable on average during the period but at the of study period DSO went to 85.06 days.

- Blockage of cash in the form of short term investment in bank shows unsuccessful planning & coordination for better investment. So, make proper cash outflow strategic or portfolio investment planning for future which will give more benefit than bank interest.
- The trend of dividend payout ratio crossed over the trend of earning per share at the end of study period & it has given DPS on the basis of cumulative profit trend. So, it suggests that CHPCL should change the strategy on dividend payment and analyze the trend.

***for Butwal Power Company Limited:***

- BPC also should try to maintain their liquidity position of CR & QR up to 2:1 & 1:1 respectively because very high & low level of ratio is not favor of company. They should consider formal working capital policy as like accounting standard. Although it has maintained QR on average during the period.
- Also, it is suggested that make effective counseling for collection from NEA in time because it covered huge proportion of receivable. And also adopt effective collection policy for other debtors because the DSO fluctuating during study period & average DSO reached to 76.91 days which is higher than CHPCL.
- Return on working capital was in decreasing trend. So, it should make proper plan to for better improvement on profitability.
- Increasing level of inventory affected to efficiency of working capital. So, the company should try to manage its inventory level at effective level by considering the market availability.

- Low level of CTR & CATR indicated low efficiency so try to improve them.

Finally, both companies have significant financial position & they have sufficient fund to introduce new hydropower project in future which helps to overcome scarcity of electricity. If they consider the formal working capital management policy, they can improve their financial position & able to manage funds successfully. Overlooking the financial concept, no company achieve at vision.

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# ANNEXES

1. Balance Sheet of CHPCL & BPC for the period of 2062/63 to 2066/67.
2. Profit & Loss a/c of CHPCL & BPC for the period of 2062/63 to 2066/67.
3. Procedure of hypothesis test

# ANNEX-I

## *BALANCE SHEET of CHPCL*

***As on (FY-2062/63 to 2066/67)***

(Rs. In million)

| **Particular** | | | **2062/63** | **2063/64** | **2064/65** | **2065/66** | **2066/67** |
|---|---|---|---|---|---|---|---|
| **CAPITAL & LIABILITIES :** | | | | | | | |
| | Share Capital | | 729.40 | 729.57 | 729.58 | 729.60 | 729.60 |
| | Medium & Long term loan | | - | 168.50 | - | - | - |
| | Reserved | | 591.00 | - | - | - | - |
| | Reserved Fund & Accumulated Profit | | 764.07 | 1,212.68 | 1,636.70 | 2,043.74 | 2,748.49 |
| | **TOTAL** | **(A)** | **2,084.47** | **2,110.75** | **2,366.28** | **2,773.34** | **3,478.09** |
| **ASSETS :** | | | | | | | |
| | Fixed Assets | | 2,189.25 | 2,114.37 | 2,011.86 | 1,916.28 | 1,869.35 |
| | Work in progress of Project | | - | - | - | - | 3.93 |
| | New Project | | 10.71 | 19.56 | 37.77 | 53.66 | 25.53 |
| | Long term Investment | | - | - | 169.85 | 169.85 | 228.53 |
| | **TOTAL FIXED ASSETS** | **(B)** | **2,199.96** | **2,133.93** | **2,219.48** | **2,139.79** | **2,127.33** |
| **CURRENT ASSETS :** | | | | | | | |
| | Inventory | | 10.30 | 12.09 | 22.32 | 36.89 | 30.90 |
| | Receivable | | 119.79 | 183.96 | 189.69 | 108.66 | 209.48 |
| | Cash & Other balance | | 64.25 | 34.23 | 277.11 | 248.47 | 44.13 |
| | Prepaid amount & Advance, Deposits & Short term Investment | | 12.49 | 11.52 | 157.11 | 601.05 | 1,165.58 |
| | **TOTAL CURRENT ASSETS** | **( C )** | **206.83** | **241.80** | **646.23** | **995.07** | **1,450.09** |
| | | | | | | | |
| | **TOTAL ASSETS** | | **2,406.79** | **2,375.74** | **2,865.71** | **3,134.87** | **3,577.42** |
| **LIABILITIES :** | | | | | | | |
| | Short term Loan | | - | - | - | - | - |
| | Payable | | 60.43 | 32.82 | 225.71 | 6.73 | 7.17 |
| | Provisions | | 267.05 | 236.04 | 278.38 | 358.17 | 95.53 |
| | **TOTAL CURRENT LIABILITIES** | **(D)** | **327.48** | **268.86** | **504.09** | **364.89** | **102.70** |
| | | | | | | | |
| | **NET CURRENT ASSETS (C-D)** | **(E)** | **(120.65)** | **(27.06)** | **142.14** | **630.18** | **1,347.39** |
| | | | | | | | |
| | Remains to written down of Expenditure | (F) | 5.16 | 3.87 | 4.65 | 3.36 | 3.36 |
| | | | - | - | - | - | - |
| | | | - | - | - | - | - |
| | **TOTAL (B+E+F)** | (G) | **2,084.47** | **2,110.75** | **2,366.28** | **2,773.34** | **3,478.09** |

## **Five Year Summary of** Balance Sheet of BPC

in Thousand NRs

| PARTICULARS | 2062/63<br>2005/2006 | 2063/64<br>2006/2007 | 2064/65<br>2007/2008 | 2065/66<br>2008/2009 | 2066/67<br>2009/2010 |
|---|---|---|---|---|---|
| **ASSETS & PROPERTY:** | | | | | |
| **Fixed Assets** | **743,605** | **743,893** | **725,742** | **765,339** | **781,666** |
| Land | 60,372 | 60,408 | 60,408 | 64,305 | 66,561 |
| Office Building & Quarters | 30,710 | 33,629 | 33,502 | 32,976 | 30,508 |
| Access Road | 3,245 | 3,014 | 2,784 | 2,554 | 2,323 |
| Suspension Bridge | 2,141 | 1,989 | 1,837 | 1,685 | 1,533 |
| Power Plant & Machinery | 368,596 | 340,697 | 314,043 | 287,502 | 281,217 |
| Switching Station | - | - | - | 20,734 | 19,893 |
| Sub Station | - | - | - | - | 33,048 |
| Transmission & Distribution Line | 254,182 | 276,756 | 267,466 | 294,953 | 305,741 |
| Office Equipments | 19,565 | 22,700 | 25,695 | 28,870 | 20,866 |
| Furnitures | 1,305 | 1,461 | 1,645 | 2,078 | 1,373 |
| Vehicles | 3,489 | 3,239 | 18,362 | 29,682 | 18,603 |
| **Work in Progress** | **37,970** | **24,369** | **37,191** | **43,155** | **95,404** |
| **Investment in Shares** | **434,481** | **465,705** | **477,858** | **706,134** | **807,211** |
| **Current Assets, Loan & Advance** | **524,022** | **647,416** | **746,136** | **743,837** | **651,519** |
| Stock | 57,623 | 58,896 | 74,647 | 92,723 | 104,543 |
| Debtors & Receivable | 35,512 | 58,918 | 88,407 | 171,359 | 93,690 |
| Cash & Bank Balance | 364,373 | 457,035 | 412,635 | 291,687 | 234,888 |
| Advance & Deposit | 66,514 | 72,567 | 170,447 | 188,068 | 218,398 |
| Deferred Revenue Expenditure | 4,369 | 888 | 4,765 | 5,735 | 5,644 |
| **Total** | **1,744,447** | **1,882,271** | **1,991,692** | **2,264,200** | **2,341,444** |
| | | | | | |
| **CAPITAL & LIABILITIES:** | | | | | |
| **Equity** | **839,058** | **839,058** | **839,058** | **839,058** | **922,968** |
| **Reserve & Surplus** | **461,510** | **455,805** | **556,762** | **707,210** | **706,834** |
| General Reserve | 148,700 | 148,700 | 148,700 | 148,700 | 148,700 |
| Retained Earnings | 222,131 | 222,805 | 306,397 | 429,502 | 385,120 |
| Grant Aid in Reserve | 90,679 | 84,300 | 101,665 | 129,008 | 173,014 |
| **Long Term Loan** | - | - | - | **26,729** | **57,970** |
| **Current Liabilities** | **440,410** | **568,510** | **570,323** | **624,543** | **566,569** |
| Short Term Loan | - | 89,947 | 183,956 | 154,294 | 205,495 |
| Creditors & Payables | 438,803 | 447,705 | 356,934 | 434,050 | 301,517 |
| Advance & Deposit | 1,607 | 30,858 | 29,433 | 36,199 | 59,557 |
| **Provisions** | **3,469** | **18,898** | **25,549** | **66,660** | **87,103** |
| Provision for Corporate Tax | 3,469 | 9,619 | 9,401 | 12,247 | 25,207 |
| Corporate Tax for 2060/61 (under Appeal) | - | - | - | 16,774 | 16,774 |
| Provision of Loss in Investment | - | 9,279 | 16,148 | 37,639 | 45,122 |
| **Total** | **1,744,447** | **1,882,271** | **1,991,692** | **2,264,200** | **2,341,444** |

## ANNEX-II
## PROFIT & LOSS A/C of CHPCL
### (FY-2062/63 TO 2066/67)

(Rs. In million)

| Particular | | 2062/63 | 2063/64 | 2064/65 | 2065/66 | 2066/67 |
|---|---|---|---|---|---|---|
| | | | | | | |
| Income from sales | | 819.41 | 903.54 | 870.01 | 883.45 | 886.56 |
| Cost of sales | | (41.03) | (54.09) | (62.28) | (58.13) | (72.73) |
| **APPROXIMATE PROFIT** | **(A)** | **778.39** | **849.45** | **807.73** | **825.31** | **813.83** |
| | | | | | | |
| Other Income | | 2.58 | 0.72 | 14.67 | 1.36 | 0.17 |
| Income from Interest | | - | - | - | 50.76 | 108.94 |
| Administration expenses | | (88.83) | (33.88) | (34.16) | (38.51) | (39.19) |
| **INCOME FROM OPERATION** | **(B)** | **692.14** | **816.29** | **788.24** | **838.93** | **883.75** |
| | | | | | | |
| Interest expenses | | (81.56) | (45.03) | (5.13) | - | - |
| Depreciation | | (102.82) | (103.79) | (103.74) | (103.57) | (104.73) |
| Deferred tax | | - | - | - | - | (1.58) |
| Income from sale of assets | | - | - | - | - | - |
| **INCOME BEFORE INCOME TAX** | **( C )** | **507.76** | **667.48** | **679.37** | **735.36** | **777.43** |
| | | | | | | |
| Tax | | - | - | - | - | - |
| **NET INCOME AFTER TAX** | | **507.76** | **667.48** | **679.37** | **735.36** | **777.43** |
| | | | | | | |
| Previous year Reserved & Income | | 511.60 | 764.07 | 1,212.68 | 1,636.70 | 1,971.06 |
| | | | | | | |
| **TOTAL CUMULATIVE PROFITE** | **(D)** | **1,019.36** | **1,431.55** | **1,892.05** | **2,372.06** | **2,748.49** |
| | | | | | | |
| **DISTRIBUTION OF PROFIT:** | | | | | | |
| Proposed Dividend | | - | - | (255.35) | (328.32) | - |
| Paid of Dividend | | (109.41) | - | - | - | - |
| Interim Dividend | | (145.88) | - | - | - | - |
| **Total** | | **(255.29)** | **-** | **(255.35)** | **(328.32)** | **-** |
| | | | | | | |
| **Transfer to Reserve & P/L a/c** | | **764.07** | **1,431.55** | **1,636.70** | **2,043.74** | **2,748.49** |

## **Five Year Summary of** Profit and Loss Account of BPC

in Thousand NRs

| PARTICULARS | 2062/63 2005/2006 | 2063/64 2006/2007 | 2064/65 2007/2008 | 2065/66 2008/2009 | 2066/67 2009/2010 |
|---|---|---|---|---|---|
| **INCOME** | | | | | |
| **Operating Income** | | | | | |
| Electricity Sale to NEA | 318,483 | 334,166 | 372,521 | 375,103 | 387,896 |
| Electricity Sale to Consumers | 39,936 | 45,603 | 49,166 | 55,697 | 65,535 |
| Electricity Services | 5,353 | 3,634 | 6,151 | 8,040 | 9,137 |
| Management and Technical Support | - | - | - | 3,740 | 17,241 |
| Consultancy Services | 11,498 | 9,535 | 18,894 | 28,108 | - |
| **Total Operating Income** | **375,270** | **392,938** | **446,732** | **470,688** | **479,809** |
| **Income from Other Sources** | | | | | |
| Interest Income | 13,639 | 15,365 | 16,495 | 11,272 | 6,408 |
| Foreign Currency Exchange Gain (Loss) | 7,483 | (25,740) | 18,217 | 30,809 | (3,651) |
| Dividend Income | 88,036 | 97,982 | 156,894 | 104,843 | 137,803 |
| Gain (Loss) on Disposal of Assets & Stock Materials | (6,090) | - | 143 | 608 | (602) |
| Depreciation Being Revenue Portion of Grant Aid | 6,833 | 6,964 | 5,276 | 5,866 | 7,547 |
| Grant Support for Technology Transfer | - | 2,794 | 3,867 | 4,317 | 2,077 |
| Other | 918 | 1,461 | 1,983 | 2,897 | 1,699 |
| **Total Non- Operating Income** | **110,819** | **98,826** | **202,875** | **160,612** | **151,281** |
| **Total Income** | **486,089** | **491,764** | **649,607** | **631,300** | **631,090** |
| **EXPENDITURE** | | | | | |
| Generation Expenses | 57,715 | 74,565 | 82,514 | 88,491 | 137,842 |
| Distribution Expenses | 31,054 | 33,303 | 48,428 | 48,700 | 55,762 |
| Management and Technical Support Expenses | - | - | - | - | 12,072 |
| Project Development Expenses | - | - | - | - | 1,045 |
| Consultancy Services | 13,692 | 8,774 | 16,743 | 18,957 | - |
| Administrative Expenses | 34,990 | 40,068 | 59,920 | 70,377 | 83,253 |
| Provision of Loss in Investment | - | 9,479 | 6,869 | 21,491 | 7,483 |
| Interest Expense | - | 5,266 | 7,246 | 7,913 | 18,104 |
| Depreciation | 49,959 | 51,924 | 55,103 | 61,873 | 60,632 |
| Staff Bonus | 6,791 | 5,926 | 9,504 | 9,659 | 5,457 |
| **Total Expenditure** | **194,201** | **229,305** | **286,327** | **327,461** | **381,650** |
| **Net Profit Before Tax** | **291,888** | **262,459** | **363,280** | **303,839** | **249,440** |
| Income Tax Provision | 3,469 | 9,619 | 9,401 | 12,247 | 25,207 |
| **Net Profit After Tax** | **288,419** | **252,840** | **353,879** | **291,592** | **224,233** |
| Retained Earnings b/f | 185,484 | 222,131 | 222,805 | 306,397 | 429,502 |
| Prior Year's Adjustment | (55) | (531) | (18,570) | (676) | (115) |
| Dividend of 2057/58 Paid | - | (41,871) | - | - | - |
| 10% Stock Dividend | - | - | - | - | (83,906) |
| Proposed Dividend | (251,717) | (209,764) | (251,717) | (167,811) | (184,594) |
| **Balance transferred to B/S** | **222,131** | **222,805** | **306,397** | **429,502** | **385,120** |

## ANNEX-III

## Procedure of hypothesis test for CHPCL

*Calculation mean, correlation coefficient of Total assets ( X ) and Current Assets (Y) of* ***CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 2,406.79 | (465.32) | 206.83 | (501.17) | 216,518.98 | 251,175.38 | 233,204.28 |
| 2063/64 | 2 | 2,375.74 | (496.37) | 241.80 | (466.20) | 246,379.21 | 217,346.17 | 231,407.81 |
| 2064/65 | 3 | 2,865.71 | (6.40) | 646.23 | (61.77) | 40.91 | 3,816.03 | 395.11 |
| 2065/66 | 4 | 3,134.87 | 262.76 | 995.07 | 287.07 | 69,044.92 | 82,406.89 | 75,430.61 |
| 2066/67 | 5 | 3,577.42 | 705.31 | 1,450.09 | 742.09 | 497,467.84 | 550,691.63 | 523,403.65 |
| | | **14,360.53** | **(0.00)** | **3,540.02** | - | **1,029,451.85** | **1,105,436.09** | **1,063,841.46** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

$\bar{X}$ = **∑X/N** = 2,872.11

$\bar{Y}$ = **∑Y/N** = 708.00

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.9973$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 23.5225$$

*Calculation mean, correlation coefficient of Fixed assets ( X ) and Current Assets (Y) of* ***CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | $x=(X-X^-)$ | Y | $y=(Y-Y^-)$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 2,189.25 | 169.03 | 206.83 | (501.17) | 28,570.77 | 251,175.38 | (84,712.89) |
| 2063/64 | 2 | 2,114.37 | 94.15 | 241.80 | (466.20) | 8,863.84 | 217,346.17 | (43,892.16) |
| 2064/65 | 3 | 2,011.86 | (8.37) | 646.23 | (61.77) | 69.98 | 3,816.03 | 516.76 |
| 2065/66 | 4 | 1,916.28 | (103.94) | 995.07 | 287.07 | 10,803.66 | 82,406.89 | (29,837.83) |
| 2066/67 | 5 | 1,869.35 | (150.87) | 1,450.09 | 742.09 | 22,762.01 | 550,691.63 | (111,959.13) |
| | | **10,101.12** | **0.00** | **3,540.02** | - | **71,070.26** | **1,105,436.09** | **(269,885.24)** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$X^-$** = **∑X/N** = 2,020.22

**$Y^-$** = **∑Y/N** = 708.00

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= -0.9629$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 6.1804$$

*Calculation mean, correlation coefficient of Current assets ( X ) and Cash & other (Y) of* ***CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | x=(X-X̄) | Y | y=(Y-Ȳ) | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 206.83 | (501.18) | 64.25 | (69.39) | 251,177.67 | 4,814.91 | 34,776.38 |
| 2063/64 | 2 | 241.80 | (466.20) | 34.23 | (99.41) | 217,346.56 | 9,882.20 | 46,345.03 |
| 2064/65 | 3 | 646.23 | (61.78) | 277.11 | 143.47 | 3,816.19 | 20,584.41 | (8,863.07) |
| 2065/66 | 4 | 995.07 | 287.07 | 248.47 | 114.83 | 82,408.56 | 13,186.79 | 32,965.20 |
| 2066/67 | 5 | 1,450.09 | 742.09 | 44.13 | (89.51) | 550,693.31 | 8,011.62 | (66,422.48) |
| | | **3,540.03** | | **668.19** | | **1,105,442.29** | **56,479.92** | **38,801.05** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**X̄** = **∑X/N** = 708.01

**Ȳ** = **∑Y/N** = 133.64

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \; y^2}}$$

$$= 0.1553$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r^{\;2}}}$$

$$= 0.2723$$

*Calculation mean, correlation coefficient of Total assets ( X ) and Cash & other (Y) of* ***CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 2,406.79 | (465.32) | 64.25 | (69.39) | 216,522.02 | 4,814.91 | 32,288.28 |
| 2063/64 | 2 | 2,375.74 | (496.37) | 34.23 | (99.41) | 246,383.27 | 9,882.20 | 49,343.77 |
| 2064/65 | 3 | 2,865.71 | (6.39) | 277.11 | 143.47 | 40.86 | 20,584.41 | (917.09) |
| 2065/66 | 4 | 3,134.87 | 262.76 | 248.47 | 114.83 | 69,044.27 | 13,186.79 | 30,174.03 |
| 2066/67 | 5 | 3,577.42 | 705.32 | 44.13 | (89.51) | 497,474.43 | 8,011.62 | (63,131.43) |
| | | **14,360.53** | | **668.19** | | **1,029,464.85** | **56,479.92** | **47,757.57** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 2,872.11

**$\bar{Y}$** = **∑Y/N** = 133.64

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.1981$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 0.3501$$

*Calculation of mean, correlation coefficient of Receivable( Y ) and Current Assets (X) of* ***CHPCL***

Rs. In million

| **Fiscal Year** | **No. of Year** | **X** | **x=(X-X⁻)** | **Y** | **y=(Y-Y⁻)** | **$x^2$** | **$y^2$** | **xy** |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 206.83 | (501.18) | 119.79 | (42.52) | 251,177.67 | 1,808.29 | 21,312.02 |
| 2063/64 | 2 | 241.80 | (466.20) | 183.96 | 21.64 | 217,346.56 | 468.46 | (10,090.51) |
| 2064/65 | 3 | 646.23 | (61.78) | 189.69 | 27.37 | 3,816.19 | 749.39 | (1,691.10) |
| 2065/66 | 4 | 995.07 | 287.07 | 108.66 | (53.66) | 82,408.56 | 2,879.55 | (15,404.53) |
| 2066/67 | 5 | 1,450.09 | 742.09 | 209.48 | 47.17 | 550,693.31 | 2,224.68 | 35,001.67 |
| | | **3,540.03** | | **811.58** | | **1,105,442.29** | **8,130.37** | **29,127.56** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**X⁻** = **∑X/N** = 708.01

**Y⁻** = **∑Y/N** = 162.32

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.3072$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 0.5591$$

*Calculation of mean, correlation coefficient of Receivable( Y ) and Total Assets (X) of* ***CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | x=(X-X̄) | Y | y=(Y-Ȳ) | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 2,406.79 | (465.32) | 119.79 | (42.52) | 216,518.98 | 1,808.29 | 19,787.10 |
| 2063/64 | 2 | 2,375.74 | (496.37) | 183.96 | 21.64 | 246,379.21 | 468.46 | (10,743.32) |
| 2064/65 | 3 | 2,865.71 | (6.40) | 189.69 | 27.37 | 40.91 | 749.39 | (175.09) |
| 2065/66 | 4 | 3,134.87 | 262.76 | 108.66 | (53.66) | 69,044.92 | 2,879.55 | (14,100.29) |
| 2066/67 | 5 | 3,577.42 | 705.31 | 209.48 | 47.17 | 497,467.84 | 2,224.68 | 33,267.21 |
| | | **14,360.53** | | **811.58** | | **1,029,451.85** | **8,130.37** | **28,035.60** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**X̄** = **∑X/N** = 2,872.11

**Ȳ** = **∑Y/N** = 162.32

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \; y^2}}$$

$$= 0.3064$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 0.5575$$

*Calculation mean, correlation coefficient of Current assets ( X ) and Inventory (Y) of* ***CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | $x=(X-X^-)$ | Y | $y=(Y-Y^-)$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 206.83 | (501.18) | 10.30 | (12.21) | 251,177.67 | 148.97 | 6,117.00 |
| 2063/64 | 2 | 241.80 | (466.20) | 12.09 | (10.41) | 217,346.56 | 108.33 | 4,852.24 |
| 2064/65 | 3 | 646.23 | (61.78) | 22.32 | (0.18) | 3,816.19 | 0.03 | 11.10 |
| 2065/66 | 4 | 995.07 | 287.07 | 36.89 | 14.39 | 82,408.56 | 207.15 | 4,131.70 |
| 2066/67 | 5 | 1,450.09 | 742.09 | 30.90 | 8.40 | 550,693.31 | 70.56 | 6,233.64 |
| | | **3,540.03** | | **112.51** | | **1,105,442.29** | **535.04** | **21,345.67** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$X^-$** = **∑X/N** = 708.01

**$Y^-$** = **∑Y/N** = 22.50

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.8777$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r^{\,2}}}$$

$$= 3.1724$$

*Calculation mean, correlation coefficient of Total assets ( X ) and Inventory (Y) of **CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 2,406.79 | (465.32) | 10.30 | (12.21) | 216,518.98 | 148.97 | 5,679.31 |
| 2063/64 | 2 | 2,375.74 | (496.37) | 12.09 | (10.41) | 246,379.21 | 108.33 | 5,166.16 |
| 2064/65 | 3 | 2,865.71 | (6.40) | 22.32 | (0.18) | 40.91 | 0.03 | 1.15 |
| 2065/66 | 4 | 3,134.87 | 262.76 | 36.89 | 14.39 | 69,044.92 | 207.15 | 3,781.89 |
| 2066/67 | 5 | 3,577.42 | 705.31 | 30.90 | 8.40 | 497,467.84 | 70.56 | 5,924.74 |
| | | **14,360.53** | | **112.51** | | **1,029,451.85** | **535.04** | **20,553.25** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 2,872.11

**$\bar{Y}$** = **∑Y/N** = 22.50

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.8758$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 3.1429$$

*Calculation mean, correlation coefficient of Net profit after tax ( X ) and Gross Working Capital (Y) of **CHPCL***

Rs. In million

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 507.76 | (165.72) | 206.83 | (501.17) | 27,463.55 | 251,175.38 | 83,055.21 |
| 2063/64 | 2 | 667.48 | (6.00) | 241.80 | (466.20) | 36.04 | 217,346.17 | 2,798.65 |
| 2064/65 | 3 | 679.37 | 5.89 | 646.23 | (61.77) | 34.72 | 3,816.03 | (363.97) |
| 2065/66 | 4 | 735.36 | 61.88 | 995.07 | 287.07 | 3,829.20 | 82,406.89 | 17,763.79 |
| 2066/67 | 5 | 777.43 | 103.95 | 1,450.09 | 742.09 | 10,805.98 | 550,691.63 | 77,141.20 |
| | | **3,367.40** | **0.00** | **3,540.02** | - | **42,169.48** | **1,105,436.09** | **180,394.87** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 673.48

**$\bar{Y}$** = **∑Y/N** = 708.00

Calculation of Correlation coefficient by using formula of Veriable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.8355$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; _2}}$$

$$= 2.6337$$

*Calculation mean, correlation coefficient between Gross profit Margin (X) & Current Ratio (Y) of* ***CSPCL***

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 0.9499 | 0.0158 | 0.6316 | (3.3003) | 0.0002 | 10.8922 | (0.0522) |
| 2063/64 | 2 | 0.9401 | 0.0060 | 0.8994 | (3.0326) | 0.0000 | 9.1964 | (0.0182) |
| 2064/65 | 3 | 0.9284 | (0.0057) | 1.2820 | (2.6499) | 0.0000 | 7.0222 | 0.0152 |
| 2065/66 | 4 | 0.9342 | 0.0001 | 2.7270 | (1.2049) | 0.0000 | 1.4517 | (0.0001) |
| 2066/67 | 5 | 0.9180 | (0.0162) | 14.1196 | 10.1877 | 0.0003 | 103.7897 | (0.1647) |
| | | **4.6706** | | **19.6596** | | **0.0006** | **132.3523** | **(0.2200)** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 0.93

**$\bar{Y}$** = **∑Y/N** = 3.93

Calculation of Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= -0.7942$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 2.2638$$

*Calculation mean, correlation coefficient between Net profit Margin (X) & Current Ratio (Y) of* ***CSPCL***

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 0.6197 | (0.1500) | 0.6316 | (3.3003) | 0.0225 | 10.8922 | 0.4952 |
| 2063/64 | 2 | 0.7387 | (0.0310) | 0.8994 | (3.0326) | 0.0010 | 9.1964 | 0.0939 |
| 2064/65 | 3 | 0.7809 | 0.0112 | 1.2820 | (2.6499) | 0.0001 | 7.0222 | (0.0296) |
| 2065/66 | 4 | 0.8324 | 0.0627 | 2.7270 | (1.2049) | 0.0039 | 1.4517 | (0.0755) |
| 2066/67 | 5 | 0.8769 | 0.1072 | 14.1196 | 10.1877 | 0.0115 | 103.7897 | 1.0921 |
| | | **3.8486** | | **19.6596** | | **0.0390** | **132.3523** | **1.5761** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 0.77

**$\bar{Y}$** = **∑Y/N** = 3.93

Calculation of Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.6936$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 1.6678$$

*Calculation mean, correlation coefficient between Net profit to Total assets Margin (X) & Quick Ratio (Y) of* ***CSPCL***

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 0.2110 | (0.0252) | 0.6001 | (3.2272) | 0.0006 | 10.4150 | 0.0814 |
| 2063/64 | 2 | 0.2810 | 0.0448 | 0.8544 | (2.9730) | 0.0020 | 8.8387 | (0.1331) |
| 2064/65 | 3 | 0.2371 | 0.0009 | 1.2377 | (2.5897) | 0.0000 | 6.7065 | (0.0023) |
| 2065/66 | 4 | 0.2346 | (0.0016) | 2.6259 | (1.2015) | 0.0000 | 1.4435 | 0.0019 |
| 2066/67 | 5 | 0.2173 | (0.0189) | 13.8188 | 9.9914 | 0.0004 | 99.8275 | (0.1884) |
| | | **1.1809** | | **19.1369** | | **0.0030** | **127.2313** | **(0.2406)** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

$\bar{X}$ = **∑X/N** = 0.24

$\bar{Y}$ = **∑Y/N** = 3.83

Calculation of Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \; y^2}}$$

$$= -0.3895$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 0.7325$$

*Calculation mean, correlation coefficient between Return on Shareholder's equity (X) & Quick Ratio (Y) of* ***CSPCL***

| **Fiscal Year** | **No. of Year** | **X** | **x=(X-X̄)** | **Y** | **y=(Y-Ȳ)** | **$x^2$** | **$y^2$** | **xy** |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 69.6134 | (22.7000) | 0.6001 | (3.2272) | 515.2884 | 10.4150 | 73.2581 |
| 2063/64 | 2 | 91.4897 | (0.8237) | 0.8544 | (2.9730) | 0.6785 | 8.8387 | 2.4489 |
| 2064/65 | 3 | 93.1183 | 0.8049 | 1.2377 | (2.5897) | 0.6479 | 6.7065 | (2.0845) |
| 2065/66 | 4 | 100.7895 | 8.4762 | 2.6259 | (1.2015) | 71.8457 | 1.4435 | (10.1837) |
| 2066/67 | 5 | 106.5559 | 14.2425 | 13.8188 | 9.9914 | 202.8500 | 99.8275 | 142.3025 |
| | | **461.5668** | | **19.1369** | | **791.3105** | **127.2313** | **205.7412** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**X̄** = **∑X/N** = 92.31

**Ȳ** = **∑Y/N** = 3.83

Calculation of Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.6484$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 1.4752$$

## Procedure of hypothesis test for BPC

*Calculation mean & correlation coefficient of Total assets ( X ) and Current Assets (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 1,744.45 | (300.36) | 524.02 | (138.56) | 90,218.41 | 19,199.98 | 41,619.61 |
| 2063/64 | 2 | 1,882.27 | (162.54) | 647.42 | (15.17) | 26,419.19 | 230.13 | 2,465.73 |
| 2064/65 | 3 | 1,991.69 | (53.12) | 746.14 | 83.55 | 2,821.61 | 6,980.60 | (4,438.08) |
| 2065/66 | 4 | 2,264.20 | 219.39 | 743.84 | 81.25 | 48,131.62 | 6,601.73 | 17,825.59 |
| 2066/67 | 5 | 2,341.44 | 296.63 | 651.52 | (11.07) | 87,991.26 | 122.48 | (3,282.84) |
| | | **10,224.05** | - | **3,312.93** | - | **255,582.08** | **33,134.92** | **54,190.01** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 2,044.81

**$\bar{Y}$** = **∑Y/N** = 662.59

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.5889$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 1.2621$$

*Calculation mean & correlation coefficient of Fixed assets ( X ) and Current Assets (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 743.61 | (8.44) | 524.02 | (138.56) | 71.30 | 19,199.98 | 1,170.03 |
| 2063/64 | 2 | 743.89 | (8.16) | 647.42 | (15.17) | 66.52 | 230.13 | 123.73 |
| 2064/65 | 3 | 725.74 | (26.31) | 746.14 | 83.55 | 692.06 | 6,980.60 | (2,197.95) |
| 2065/66 | 4 | 765.34 | 13.29 | 743.84 | 81.25 | 176.62 | 6,601.73 | 1,079.83 |
| 2066/67 | 5 | 781.67 | 29.62 | 651.52 | (11.07) | 877.17 | 122.48 | (327.77) |
| | | **3,760.25** | **0.00** | **3,312.93** | - | **1,883.67** | **33,134.92** | **(152.13)** |
| | | **$\sum X$=** | | **$\sum Y$=** | | **$\sum x^2$** | **$\sum y^2$** | **$\sum xy$** |

**N** = **5**

$\bar{X}$ = $\sum X/N$ = 752.05

$\bar{Y}$ = $\sum Y/N$ = 662.59

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= -0.0193$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 0.0334$$

*Calculation mean & correlation coefficient of Current assets ( X ) and Cash & Bank balance (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | x=(X-X̄) | Y | y=(Y-Ȳ) | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 524.02 | (138.56) | 364.37 | 12.25 | 19,199.98 | 150.05 | (1,697.33) |
| 2063/64 | 2 | 647.42 | (15.17) | 457.04 | 104.91 | 230.13 | 11,006.40 | (1,591.51) |
| 2064/65 | 3 | 746.14 | 83.55 | 412.64 | 60.51 | 6,980.60 | 3,661.63 | 5,055.73 |
| 2065/66 | 4 | 743.84 | 81.25 | 291.69 | (60.44) | 6,601.73 | 3,652.58 | (4,910.53) |
| 2066/67 | 5 | 651.52 | (11.07) | 234.89 | (117.24) | 122.48 | 13,744.19 | 1,297.45 |
| | | **3,312.93** | | **1,760.62** | | **33,134.92** | **32,214.85** | **(1,846.19)** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**X̄** = **∑X/N** = 662.59 **Ȳ** = **∑Y/N** = 352.12

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= -0.0565$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for (n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 0.098$$

*Calculation mean & correlation coefficient of Total assets ( X ) and Cash (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 1,744.45 | (300.36) | 364.37 | 12.25 | 90,218.41 | 150.05 | (3,679.28) |
| 2063/64 | 2 | 1,882.27 | (162.54) | 457.04 | 104.91 | 26,419.19 | 11,006.40 | (17,052.28) |
| 2064/65 | 3 | 1,991.69 | (53.12) | 412.64 | 60.51 | 2,821.61 | 3,661.63 | (3,214.29) |
| 2065/66 | 4 | 2,264.20 | 219.39 | 291.69 | (60.44) | 48,131.62 | 3,652.58 | (13,259.14) |
| 2066/67 | 5 | 2,341.44 | 296.63 | 234.89 | (117.24) | 87,991.26 | 13,744.19 | (34,775.97) |
| | | **10,224.05** | | **1,760.62** | | **255,582.08** | **32,214.85** | **(71,980.96)** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 2,044.81

**$\bar{Y}$** = **∑Y/N** = 352.12

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= -0.7933$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 2.2569$$

*Calculation mean & correlation coefficient of Current assets ( X ) and Debtors (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 524.02 | (138.56) | 35.51 | (54.07) | 19,199.98 | 2,923.05 | 7,491.49 |
| 2063/64 | 2 | 647.42 | (15.17) | 58.92 | (30.66) | 230.13 | 939.99 | 465.10 |
| 2064/65 | 3 | 746.14 | 83.55 | 88.41 | (1.17) | 6,980.60 | 1.37 | (97.77) |
| 2065/66 | 4 | 743.84 | 81.25 | 171.36 | 81.78 | 6,601.73 | 6,688.26 | 6,644.85 |
| 2066/67 | 5 | 651.52 | (11.07) | 93.69 | 4.11 | 122.48 | 16.92 | (45.52) |
| | | **3,312.93** | | **447.89** | | **33,134.92** | **10,569.58** | **14,458.16** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 662.59

**$\bar{Y}$** = **∑Y/N** = 89.58

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.7726$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 2.1077$$

*Calculation mean & correlation coefficient of Total Assets ( X ) and Debtors (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 1,744.45 | (300.36) | 35.51 | (54.07) | 90,218.41 | 2,923.05 | 16,239.23 |
| 2063/64 | 2 | 1,882.27 | (162.54) | 58.92 | (30.66) | 26,419.19 | 939.99 | 4,983.34 |
| 2064/65 | 3 | 1,991.69 | (53.12) | 88.41 | (1.17) | 2,821.61 | 1.37 | 62.16 |
| 2065/66 | 4 | 2,264.20 | 219.39 | 171.36 | 81.78 | 48,131.62 | 6,688.26 | 17,942.04 |
| 2066/67 | 5 | 2,341.44 | 296.63 | 93.69 | 4.11 | 87,991.26 | 16.92 | 1,219.99 |
| | | **10,224.05** | | **447.89** | | **255,582.08** | **10,569.58** | **40,446.77** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 2,044.81

**$\bar{Y}$** = **∑Y/N** = 89.58

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.7782$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n \quad Z \quad 2}}{\sqrt{1 \quad Z \quad r \quad 2}}$$

$$= 2.1463$$

*Calculation mean & correlation coefficient of Current assets ( X ) and Inventory Assets (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 524.02 | (138.56) | 57.62 | (20.06) | 19,199.98 | 402.54 | 2,780.06 |
| 2063/64 | 2 | 647.42 | (15.17) | 58.90 | (18.79) | 230.13 | 353.08 | 285.05 |
| 2064/65 | 3 | 746.14 | 83.55 | 74.65 | (3.04) | 6,980.60 | 9.24 | (253.94) |
| 2065/66 | 4 | 743.84 | 81.25 | 92.72 | 15.04 | 6,601.73 | 226.10 | 1,221.74 |
| 2066/67 | 5 | 651.52 | (11.07) | 104.54 | 26.86 | 122.48 | 721.28 | (297.22) |
| | | **3,312.93** | | **388.43** | | **33,134.92** | **1,712.23** | **3,735.69** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**$\bar{X}$** = **∑X/N** = 662.59

**$\bar{Y}$** = **∑Y/N** = 77.69

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.4960$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 0.9894$$

*Calculation mean & correlation coefficient of Total assets ( X ) and Inventory (Y) of BPC*

(Rs.in million)

| Fiscal Year | No. of Year | X | x=(X-X̄) | Y | y=(Y-Ȳ) | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 1,744.45 | (300.36) | 57.62 | (20.06) | 90,218.41 | 402.54 | 6,026.32 |
| 2063/64 | 2 | 1,882.27 | (162.54) | 58.90 | (18.79) | 26,419.19 | 353.08 | 3,054.19 |
| 2064/65 | 3 | 1,991.69 | (53.12) | 74.65 | (3.04) | 2,821.61 | 9.24 | 161.45 |
| 2065/66 | 4 | 2,264.20 | 219.39 | 92.72 | 15.04 | 48,131.62 | 226.10 | 3,298.87 |
| 2066/67 | 5 | 2,341.44 | 296.63 | 104.54 | 26.86 | 87,991.26 | 721.28 | 7,966.56 |
| | | **10,224.05** | | **388.43** | | **255,582.08** | **1,712.23** | **20,507.38** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

**X̄** = **∑X/N** = 2,044.81

**Ȳ** = **∑Y/N** = 77.69

Calculation of Karl Pearson's Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \; y^2}}$$

$$= 0.9803$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \; X \; \frac{\sqrt{n \;\; Z \;\; 2}}{\sqrt{1 \;\; Z \;\; r \;\; 2}}$$

$$= 8.5965$$

*Calculation mean, correlation coefficient & PE of Net profit after tax ( X ) and Gross Working Capital (Y) of **BPC***

Rs. In million

| Fiscal Year | No. of Year | X | $x=(X-\bar{X})$ | Y | $y=(Y-\bar{Y})$ | $x^2$ | $y^2$ | xy |
|---|---|---|---|---|---|---|---|---|
| 2062/63 | 1 | 288.42 | 6.23 | 524.02 | (138.56) | 38.77 | 19,199.98 | (862.75) |
| 2063/64 | 2 | 252.84 | (29.35) | 647.42 | (15.17) | 861.58 | 230.13 | 445.28 |
| 2064/65 | 3 | 353.88 | 71.69 | 746.14 | 83.55 | 5,138.94 | 6,980.60 | 5,989.40 |
| 2065/66 | 4 | 291.59 | 9.40 | 743.84 | 81.25 | 88.35 | 6,601.73 | 763.71 |
| 2066/67 | 5 | 224.23 | (57.96) | 651.52 | (11.07) | 3,359.32 | 122.48 | 641.44 |
| | | **1,410.96** | **0.00** | **3,312.93** | - | **9,486.95** | **33,134.92** | **6,977.07** |
| | | **∑X=** | | **∑Y=** | | **$\sum x^2$** | **$\sum y^2$** | **∑xy** |

**N** = **5**

$\bar{X}$ = **∑X/N** = 282.19

$\bar{Y}$ = **∑Y/N** = 662.59

Calculation of Correlation coefficient by using formula of Variable "x" & "y" (using calculator)

$$r = \frac{xy}{\sqrt{x^2 \quad y^2}}$$

$$= 0.3935$$

Calculation the value of Student's t-test of correlation coefficient to test validity of the assumptions at 5% level of significance for(n-2)=3 degree of freedom.

$$t = r \times \frac{\sqrt{n - 2}}{\sqrt{1 - r^2}}$$

$$= 0.7414$$