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Study and Ratio Analysis of Chhattisgarh State Power Distribution Company Ltd. (CSPDCL), Raipur (C.G.)

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Abstract: This paper is based on the working an electricity distribution company, namely "Chhattisgarh State Power Distribution Company Ltd. (CSPDCL)". For the sake of convenience, the company has been mentioned in this paper by its abbreviation i.e. CSPDCL It includes various financial data of the company which encompasses the detailed study of growth patterns with the help of ratio analysis techniques. This work aims to bring forward the areas in which the proposed company succeeded and/or failed in fulfilment of its objectives, and covers an analytical study of latest audited reports issued by the company on its website. The study is based on the comparative financial data published of consecutive three financial years i.e. 2013-14, 2014-15 and 2015-16. Maximum efforts have been made with the help of graphical representations, tabulation and other measures to make this report more comprehensive and lucid to understand.

Keywords: Ratio Analysis, CSPDCL, Electricity, Renewable energy sources

I. INTRODUCTION

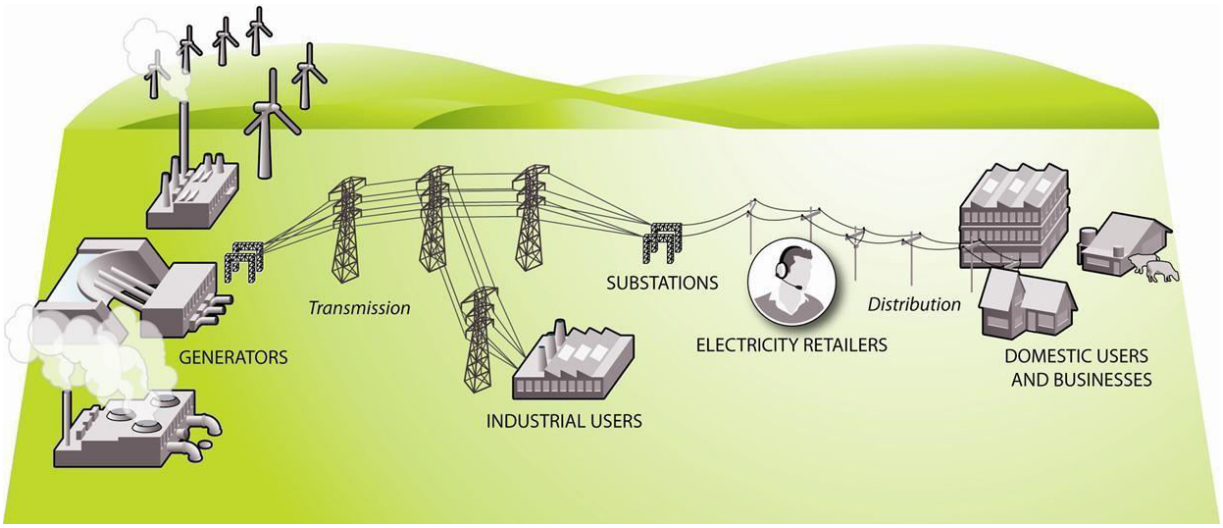

Fig 1 Diagram showing the generation, transmission and distribution of electricity

Power is one of the most critical components of infrastructure crucial for the economic growth and

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welfare of nations. The existence and development of adequate infrastructure is essential for sustained growth of the Indian economy.

India's power sector is one of the most diversified in the world. Sources of power generation range from conventional sources such as coal, lignite, natural gas, oil, hydro and nuclear power to viable non-conventional sources such as wind, solar, and agricultural and domestic waste. Electricity demand in the country has increased rapidly and is expected to rise further in the years to come. In order to meet the increasing demand for electricity in the country, massive addition to the installed generating capacity is required.
India ranks third among 40 countries in EY's Renewable Energy Country Attractiveness Index, on back of strong focus by the government on promoting renewable energy and implementation of projects in a time bound manner.

India has moved up 73 spots to rank 26th in the World Bank's list of electricity accessibility in 2017, according to Mr Piyush Goyal, Minister of State (Independent Charge) for Power, Coal, Renewable Energy and Mines, Government of India.

In September 2017, the Government of India launched the Saubhagya scheme to provide electricity connections to over 40 million families in rural and urban areas by December 2018 at a cost of US$ 2.5 billion[1][2].

a. Market Size

Indian power sector is undergoing a significant change that has redefined the industry outlook. Sustained economic growth continues to drive electricity demand in India. The Government of India's focus on attaining 'Power for all' has accelerated capacity addition in the country. At the same time, the competitive intensity is increasing at both the market and supply sides (fuel, logistics, finances, and manpower). Total installed capacity of power stations in India stood at 330,860.58 Megawatt (MW) as on December, 2017. The Ministry of Power has set a target of 1,229.4 billion units (BU) of electricity to be generated in the financial year 2017-18, which is 50 BU's higher than the target for 2016-17. The annual growth rate in renewable energy generationhas been estimated to be 27 per cent and 18 per cent for conventional energy [3][4].

The Indian solar industry has installed a total of 2,247 megawatts (MW) in the third quarter of 2017, from 1,947 MW in the second quarter of 2017. The cumulative installed capacity reached 7,149 MW in the first nine months of 2017, covering more than one-third of total new power capacity addition in 2017[5].

Two under-construction hydro projects of NHPC in Himachal Pradesh and Jammu & Kashmir (J&K), expected to be commissioned in 2018, will produce 4,458.69 million units of additional power, according to the Ministry of Power, Government of India.

The total estimated potential of tidal energy in India is about 8,000 megawatt (MW), of which 7,000 MW is in the Gulf of Kambhat, 1,200 MW is in the Gulf of Kutch and 100 MW in the Gangetic Delta. The number of small hydro power projects set up in India stood at 1,085 with total installed capacity of 4,399.355 megawatt (MW) as of November 30, 2017[6].

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b. Investment Scenario

Around 293 global and domestic companies have committed to generate 266 GW of solar, wind, mini-hydel and biomass-based power in India over the next 5–10 years. The initiative would entail an investment of about US$ 310–350 billion. Between April 2000 and September 2017, the industry attracted US$ 12.3 billion in Foreign Direct Investment (FDI), accounting for 3.44 per cent of total FDI inflows in India.

c. The Road Ahead

The Government of India has released its roadmap to achieve 175 GW capacityin renewable energy by 2022, which includes 100 GW of solar power and 60 GW of wind power. The Union Government of India is preparing a 'rent a roof' policy for supporting its target of generating 40 gigawatts (GW) of power through solar rooftop projects by 2022. Coal-based power generation capacity in India, which currently stands at 192 GW is expected to reach 330-441 GW by 2040.

The 2026 forecast for India's non-hydro renewable energy capacity has been increased to 155 GW from 130 GW on the back of more than expected solar installation rates and successful wind energy auctions#. India could become the world's first country to use LEDs for all lighting needs by 2019, thereby saving Rs 40,000 crore (US$ 6.23 billion) on an annual basis. India's installed solar power capacity reached 14,771.69 as of September 2017.

The government's immediate goal is to generate two trillion units (kilowatt hours) of energy by 2019. This means doubling the current production capacityto provide 24x7electricity for residential, industrial, commercial and agriculture use. A total of 16,064 villages out of 18,452 un-electrified villages in India have been electrified up to December 2017 as part of the target to electrify all villages by May 1, 2018[7][8].

The Government of India is taking a number of steps and initiatives like 10-yeartax exemption for solar energy projects, etc., in order to achieve India's ambitious renewable energy targets of adding 175 GW of renewable energy, including addition of 100 GW of solar power, by the year 2022. The government has also sought to restart the stalled hydro power projects and increase the wind energy production target to 60 GW by 2022 from the current20 GW.

The electric power industry covers the generation, transmission, distribution and sale of electric power to the general public and industry. The commercial distribution of electric power started in 1882 when electricity was produced for electric lighting. In the 1880s and 1890s, growing economic and safety concerns lead to the regulation of the industry. Once an expensive novelty limited to the most densely populated areas, reliable and economical electric power has become an essential aspect for normal operation of all elements of developed economies[9].

By the middle of the 20th century, electricity was seen as a "natural monopoly", only efficient if a restricted number of organizations participatedin the market; in some areas, vertically-integrated companies provide all stagesfrom generation to retail, and only governmental supervision regulated the rate of return and cost structure.

Since the 1990s, many regions have opened up the generation and distributionof electric power to provide a more competitive electricity market. While such markets can be abusively manipulated with consequent adverse price andreliability impact to consumers, generally competitive production

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of electrical energy leads to worthwhile improvements in efficiency[10].

India, like any other developing country, cannot overlook the pivotal role of the power sector in fuelling its overall development. All other sectors require a constant and reliable supply of electricity for the economy to function and grow. What sets the country apart though is the fact that it is the fifth largest producer and consumer of electricity with a capacity of 302 gigawatts (GW). From a meagre 1,743 megawatt hour (MWh) in 1950-51, the gross electricity generation boomed to 278,733 MWh.

d. Organization

The electric power industry is commonly split up into four processes. These are electricity generation such as a power station, electric power transmission, electricity distribution and electricity retailing. In many countries, electric power companies own the whole infrastructure from generating stations to transmission and distribution infrastructure. For this reason, electric power is viewed as a natural monopoly. The industry is generally heavily regulated,often with price controls and is frequently government-owned and operated. However, the modern trend has been growing deregulation in at least the latter two processes.[5]

The nature and state of market reform of the electricity market often determines whether electric companies are able to be involved in just some of these processes without having to own the entire infrastructure, or citizens choose which components of infrastructure to patronise. In countries where electricity provision is deregulated, end-users of electricity may opt for more costly green electricity.

The distribution of power generation through different sources, however, is uneven. The thermal power contribution to this is around 63%, followed by hydropower contributing around 25%. The share of nuclear power is the smallest with 3%, and the power generation through renewable sources contributes the remaining 9%. The distribution of power generation amongst various states and regions in India is also highly uneven. The reason behind this uneven distribution is that India has over 200 billion

Power or electricity is very essential constituent of infrastructure affecting economic growth and welfare of the country. Currently, the power sector is at a crucial juncture of its evolution, with many private producers and domestic manufacturers also playing a significant role in various capacities, and greater reliance on markets, subject to regulation. Developers of Power Plants have been facing numerous constraints like coal/gas allocation, environment clearance, land acquisition, financing and funds tie-ups, etc. for last about 4 years. This has resulted in only very few new projects coming up.

e. Performance of the industry

India is the 5th largest producer of electricity in the world. At an electricity- GDP elasticity ratio of 0.8, electricity will continue to remain a key input for India's economic growth. Electricity demand is likely to reach 155 GW by 2016- 17 & 217 GW by 2021-22 whereas peak demand will reach 202 GW & 295 GW over the same period respectively. In India, the total power generated hasbeen 1048.5 BU during the FY 2014-15. There has been a shift to renewable power as the same constitutes of 27.25% of the total installed capacity[11].

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India has a huge hydro power potential of 148 GW, out of which only 42 G has been realized till date. Steps have been taken to attract investments into the hydro sector and increase the falling share of hydroelectricity in the country's installed capacity mix. Government is planning Hydropower Purchase Obligation (HPO), which will obligate the power distribution companies to purchase power from hydro power plants. This has led to signs of revival in hydro power segment. However, the Supreme Court verdict staying 23 Hydro Projects in Uttarakhand has acted as a dampener, thereby delaying the imminent revival in the sector. The Nuclear business is primarily driven by government policies, public perceptions and global dynamics.

II. POWER GENERATION

The existing installed power generation capacity of the state is 19,827 MW. Further, the state is expected to see a capacity addition of 22,000 MW during the end of 12th Five year plan which is mainly for meeting the demand ofother states. CSPGCL currently has an installed capacity of 2424 MW, out of which 2240 MW is from coal based power plants. CSPGCL will also add an additional capacity of 1000 MW (2 x 500 MW Marwa) by the end of December 2015 which will increase the installed capacity of CSPGCL to 3424 MW by the end of FY 2016. Some of the changes in key parameters after creation ofChhattisgarh state has been shown below.

Particulars	November 2001	March 2015	Increase /Decrease (%)
Installed Capacity (MW)	1,360	2,424	78%
Power generation (MU)	7,138	15,592	118%
PLF (%)	65.72	78.07 (64.5)*	18.79%
Auxiliary Consumption (%)	10.35	8.57	17.20%
Specific Oil Consumption (ml/Kwh)	2.14	0.804	62.43%
Specific Coal Consumption(Kg/ Kwh)	0.79	0.770	2.53%

National average

Table 1: CSPGCL PerformancePOWER TRANSMISSION

Chhattisgarh has total interstate transformation capacity of 23,205 MVA of which 90% of the capacity was installed in last 3 years. In last one year the capacity addition has been at 4300 MVA. The majority of the network is planned for exporting power outside Chhattisgarh with installed line length of 8300 ckt.km (7% of total network in country). The transmission export capacity in the

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state to other parts of the country has been shown below:

Export Capacity Towards (MW)	Existing Capacity	Under Construction	Under Consideration	Total
East	10,000	6300	-	16,300
North/West	12,000	14,400	-	26,400
South	-	-	6000	6000
	22,000	20,700	6000	48,700

Table 2: Export Capacity in Chhattisgarh

To meet the demand of Chhattisgarh intra state transmission network has been developed by CSPTCL which provides connectivity to CSPDCL consumers. A capacity of 6030 MVA has been 5 developed by CSPTCL to meet the demand. A summary of capacity expansion has been shown in the table below:

Particulars	Nov 2000	March 2015	Change (%)
400 kV (ckt.km)	277	1538	455 %
220 kV (ckt.km)	1594	3314	108 %
132 kV (ckt.km)	2974	5476	84 %
400/220 kV S/s	1	2	100 %
220/132 kV S/s	5	19	280 %
132/33 kV S/s	20	69	245 %

Table 3: CSPTCL PerformancePOWER DISTRIBUTION

The function of power distribution in the state is undertaken by CSPDCL. It currently caters to 43 lakh LT consumers and 2,336 HT & EHT consumershaving a total connected load of 7,102 MW. CSPDCL has 15.95 lakh BPL consumers who are given 480 units of free power annually. CSPDCL also caters to 3.46 lakh agriculture consumers with a total demand of 936 MW who are provided with free power up to 7500 units annually. The comparative of growth in key parameters is shown below:

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Particulars	Position as on		Percentage Growth
	Dec-2000	*May-15*	
Maximum Demand (in MW)	1,334	3,950	196%
LT consumers (In Lakh)	18.9	43	*128%*
Agriculture pumps (in Lakhs)	0.73	3.46	372%
BPL Connection (In lakh)	6.3	15.95	153%
HT consumers	530	2,336	340%
Connected load (in MW)	1,976	7,102	259%
Agriculture load (in MW)	191	936	390%

Table 4: CSPDCL Performance

III. ELECTRIFICATION

As per the census 2011, the state has a population of 2.55 Crores with 40% of population concentrated in Raipur, Durg and Bilaspur districts. Chhattisgarh household electrification had reached a level of 75% (94% in urban and 70% in rural areas respectively) as per the census 2011, which is comparatively higher than the overall India average of 67%. District wise household electrification data in the state is shown below:

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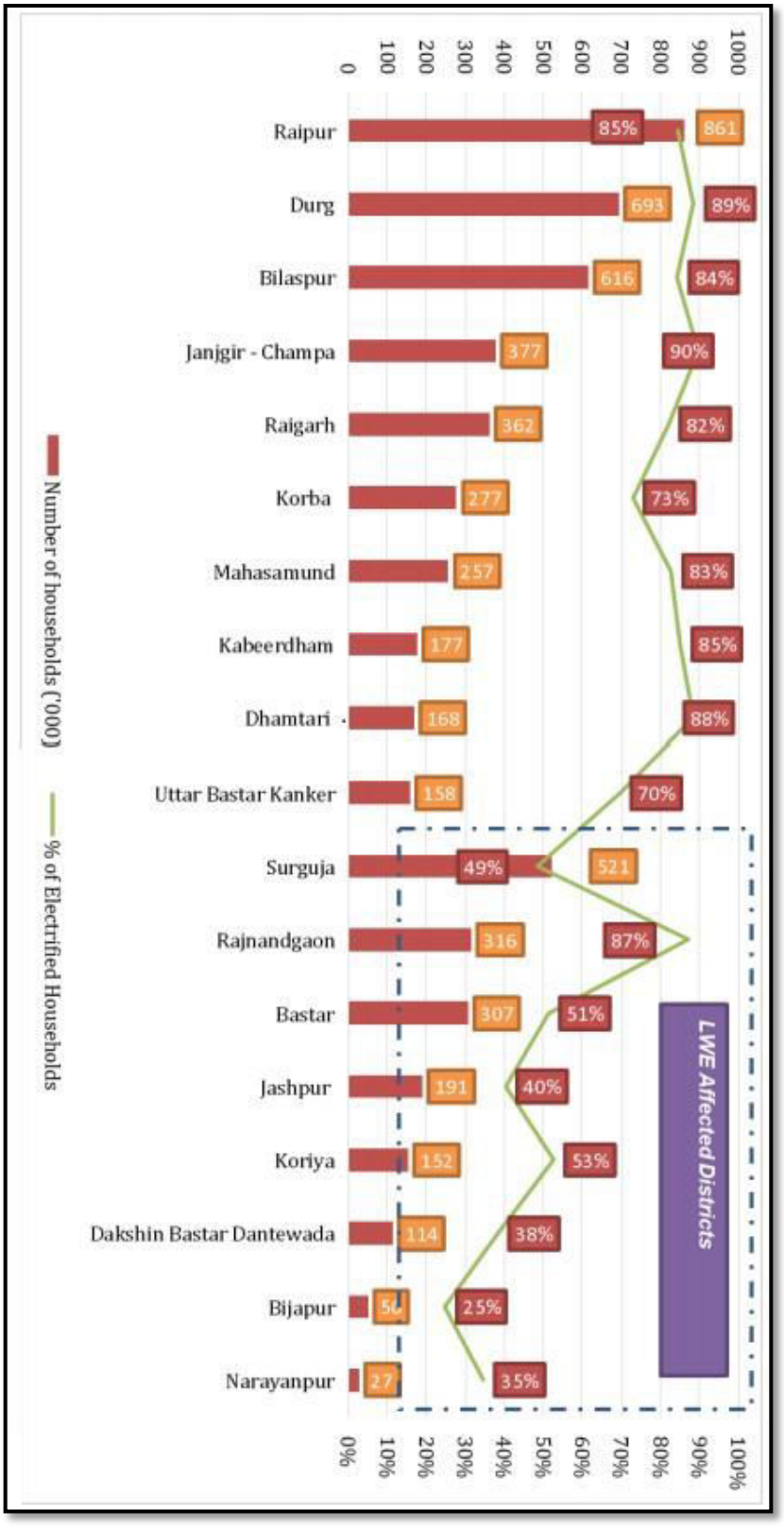

Fig 2 Household Electrification in Chhattisgarh (District Level - Census 2011)

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a. Per Capita Electricity Consumption

The population of Chhattisgarh has grown from 2,08,33,803 in 2001 to 2,55,45,198 in 2011 at the decadal CAGR of 2.06%. The same growth rate has been considered for estimating the population beyond 2011. The per capita electricity consumption of Chhattisgarh based on energy demand for the state and generation from CPP's in FY 2014-15 was registered at 1724 kWh. The corresponding all India average was 1010 kWh. The high per capita electricity consumption in Chhattisgarh as compared to the national average is on account of presence of the captive power plants installed by large industries in the state which have been growing rapidly due to abundant mineral resources in the state. Increase in access to power to rural areas of the state have also contributed to increase in per capita consumption. The per capita electricity consumption in the state is shown below:

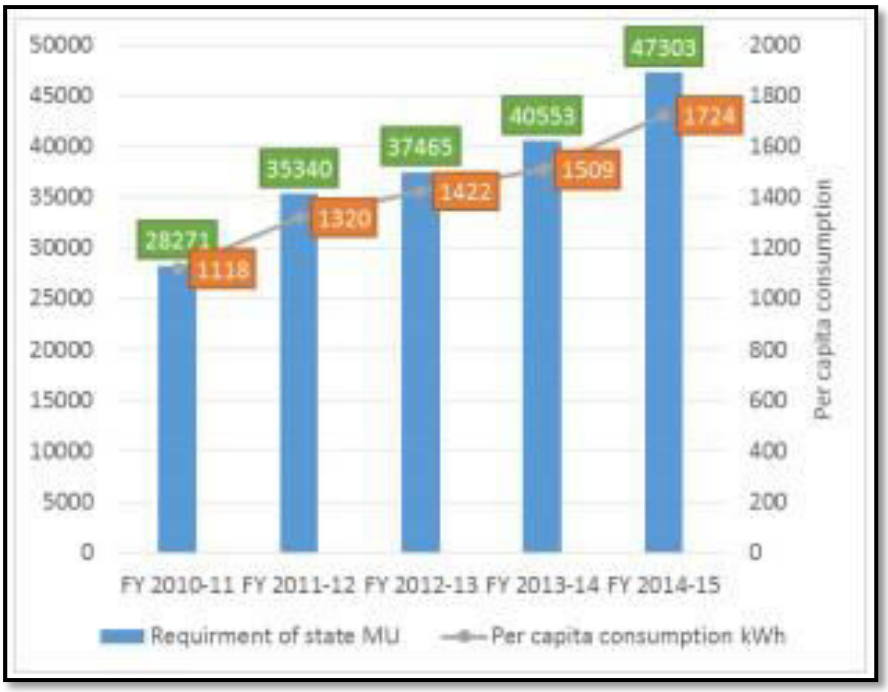

Fig 3 Per Capita Electricity Consumption in Chhattisgarh

IV. ANALYSIS OF EFFICIENCY AS PER ACTIVITY/TURNOVERRATIOS

As name suggests these ratios interpret the efficiency of a concern. Activity ratios reflect the intensity with which the firm uses assets in generating sales. These ratios indicate whether the firm's investment in assets is too large, it could be that the funds tied up in those assets, should be used for more immediate productive purposes. If the investment is too small, the firm may be providing some poor services to customer or inefficiently producing its products.

This ratio is meant to compute the paying period and receipt period of thecash. The company has paid its debts in how much time and it can receive its cash in how much time.

We can determine the efficiency of the company by these ratios:

- Stock Turnover Ratio

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- Debtors Turnover Ratio
- Average Collection Period
- Creditors Turnover Ratio
- Average Payment Period
- Working Capital Turnover Ratio
- Fixed Assets Turnover Ratio
- Current Assets Turnover Ratio

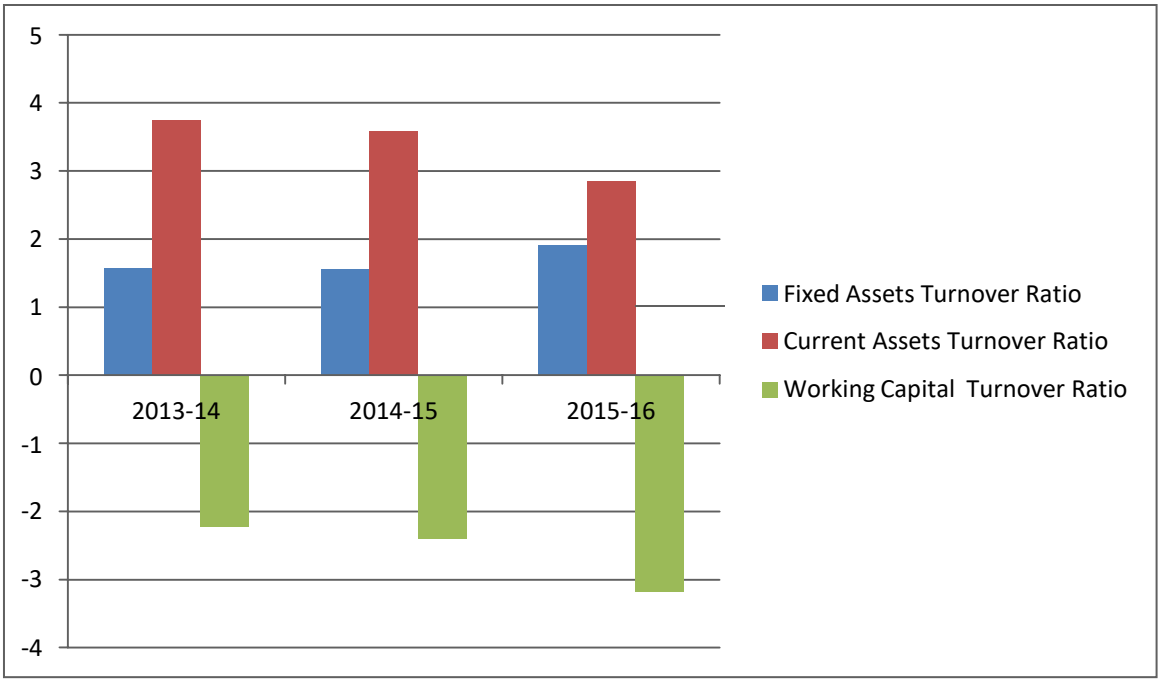

Fig 4 Graph showing Turnover Ratios

a. ANALYSIS OF SOLVENCY RATIOS

Solvency ratio is one of the various ratios used to measure the ability of a company to meet its long term debts. Moreover, the solvency ratio quantifies the size of a company's after tax income, not counting non-cash depreciation expenses, as contrasted to the total debt obligations of the firm. Also, it provides an assessment of the likelihood of a company to continue congregating its debt obligations.

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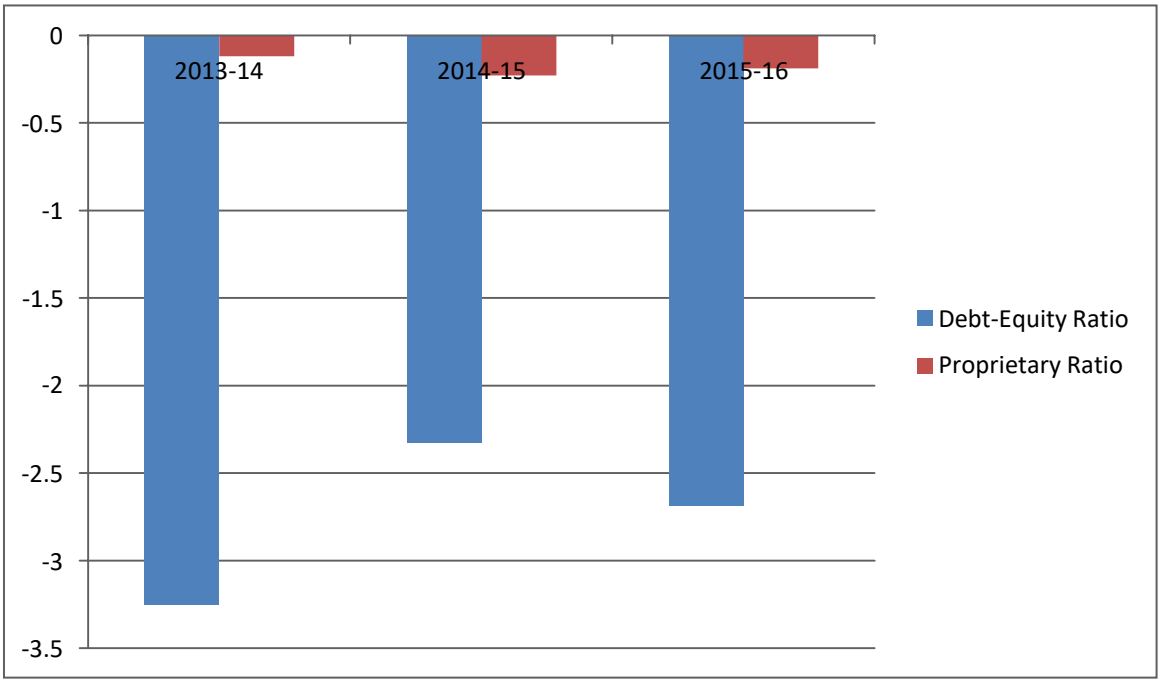

Fig 5 Graph showing Solvency Ratios

b. ANALYSIS OF PROFITABILITY RATIO

Profitability is a measure of efficiency and control. Earnings of more and more profits with the optimum utilization of available resources of business are called profitability. It expresses efficiency and effectiveness of business with which business has been operated. All parties to a concern whether outsiders or insiders to the business are interested in the profitability of the business.The profitability ratios include the following:

a. Gross Profit Ratio
b. Net Profit Ratio
c. Operating Ratio
d. Net Operating Profit Ratio

Fig 6 Graph showing Profitability Ratios

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c. ALYSIS OF OVERALL PROFITABILITY RATIO

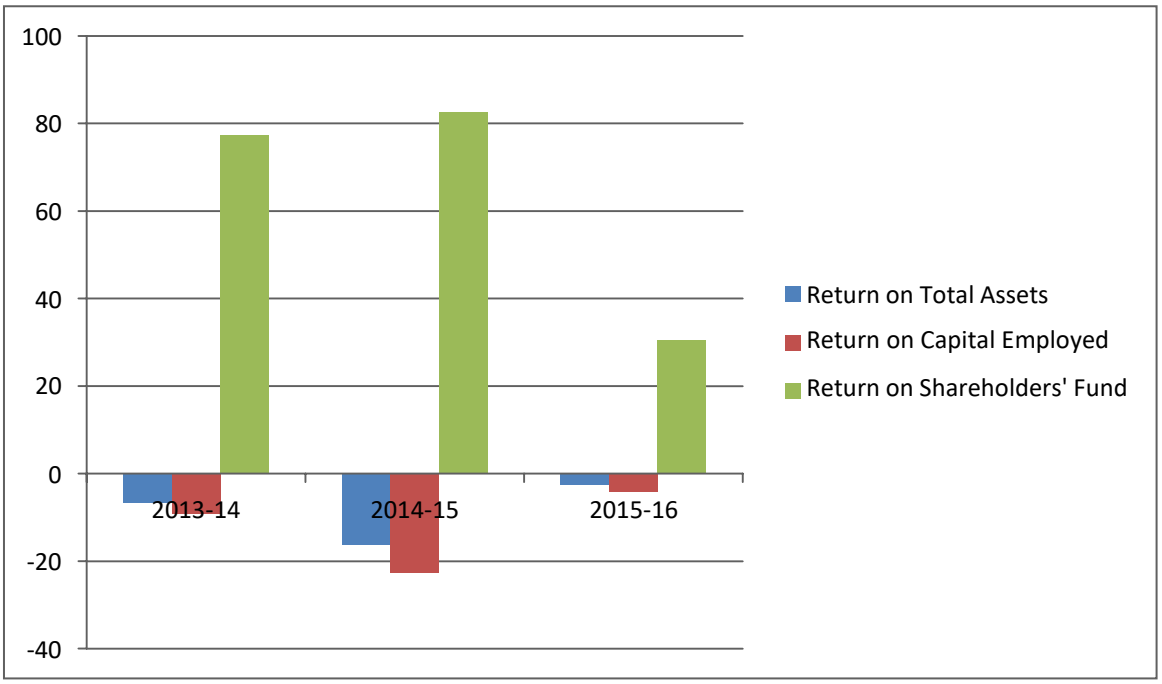

Fig 7 Graph showing Overall Profitability Ratios

V. FINDINGS & RECOMMENDATIONS

- The current ratio was 0.373 in 2013-14, which has increased to 0.4 in 2014-15 and a bit improvement in 2015-16, where current ratio has been increased to 0.53. Both the current asset and current liabilities are increasing. Company should try to maintain the ratio at the standard level. Company should try to pay its liabilities in time, which will help it to maintain a good financial position. Company can increase its current assets but not by increasing its level of inventory but by increasing its other current assets.
- The quick ratio of CSPDCL is less than 1:1. So it is not satisfactory. Also it is fluctuating every year due to fluctuation in inventory year after year. Company should improve the standard. It should not be more than that nor be less than standard ratio. Company should try to make good investments in short term assets. Company should decrease the increasing level of stock as it is affecting the liquidity of the company.
- The conversion of stock into sales is measured by inventory turnover ratio. As that inventory turnover ratio of CSPDCL is satisfactory it is increasing continuously which indicates the proper-investment in stock. It means we are able to effectively convert our inventory into sales that is more sales are being produced by a unit of investment in stocks. Company should take care of stock turnover ratio and try to maintain it. Company should decrease its conversion period. Company should increase the investment in inventory.
- As that CSPDCL is suffering from losses continuously means profit is decreasing. It is very critical situation. But after 2014-15 the loss ratio is decreasing, it shows that CSPDCL is in better condition

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From the previous situation. But it should try to convert its loss into profit in the coming years.

- The return on shareholder's funds had decreased which indicates that the company is now returning less to shareholders from morefunds of shareholders.
- If we see the fixed assets ratio of the company than we know that the fixed assets turnover ratio decreased in the year 2014-15 compared to previous year but it has increased in 2015-16 which shows that the company has utilized its fixed assets effectively. Company should reduce investment in fixed asset as sales areincreasing at the rate at which fixed assets are increasing.

VI. CONSTRAINTS IN RATIO ANALYSIS

Though ratio analysis technique has got number of advantages, it attracts equal number of disadvantages too. Some of important advantages are as follows:

1. The ratios of the other organization May not be readily available.
2. Different accounting policies may be followed by the constituent organization in the industry.
3. The constituent organization in the same industry may vary from each other in terms of age, location, extent of automation, quality of management and so on.
4. The technique of ratio analysis may prove to be inadequate in some situation if there is difference of opinions regarding the interpretation of certain items while computing certain ratios.
5. As the ratios are computed on the basis of financial statements, the basic limitation, which is applicable to the financial statements, is equally applicable in case of the technique of ratio analysis also.

Thus the ratio analysis points out the financial condition of business whether it is very strong, good, questionable or poor and enables the management totake necessary steps.

VI. CONCLUSION

After the study and analysis of financial statements of CSPDCL it can be said that there are huge inefficiencies in handling finance by the company whichhas led to the inclination of growth and productivity towards decline. Many of the ratios were found negative which represented the evidence of poor performance indicating that there is a high requirement of changes in policies and strategies of operations and finance department. Since the demand of the product/service is improbable to decline in current market scenario given the rationale of it being believed to be the utmost important requirement forindividuals after the basic human needs (i.e. food, clothes, shelter and health facilities), and given consideration to industrial and agricultural implication of provision of the aforementioned basic requirements to individuals in the economy keeps the demand intact among all kinds of consumers. Such conditions have contributed to favourable inventory turnover ratio.

The company does not have a good short term liquidity position as both the liquidity ratios (current ratio and quick ratio) are not favorable and appreciable which concludes that company has got insufficient assets to pay off short term debts as and when they fall due.

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Overall the company is not in a good position as it is incurring losses over subsequent years and the ratios like solvency ratio, overall profitability ratio, and some of the other ratios give a negative impactof the company. Because of continuous losses it is not able to maintain the standard ratios.

Therefore, the company is required to increase its profitability by making appropriate strategies about the improvement of proper allocation of assets and make a balance between assets and liabilities inorder to avoid heavy losses. The external liabilities of the company must be paid before the due date to maintain the goodwill of the company.

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