



RESEARCH ARTICLE

ENERGY CONSUMPTION AND DISTRIBUTION UNDER BONGAIGAON SUB-DIVISION- II APDCL (ASSAM), INDIA

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Abstract

Assam Power Distribution Company Limited (APDCL) is the only public company which is responsible for power distribution in Assam. This article analysis demand and supply gap of electricity of Assam and percentages changes of shortages, demand and availability of energy and also study the rural area of Bongaigaon's connected load mix, using R-square, trend analysis.

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Introduction:-

Definition of Electricity

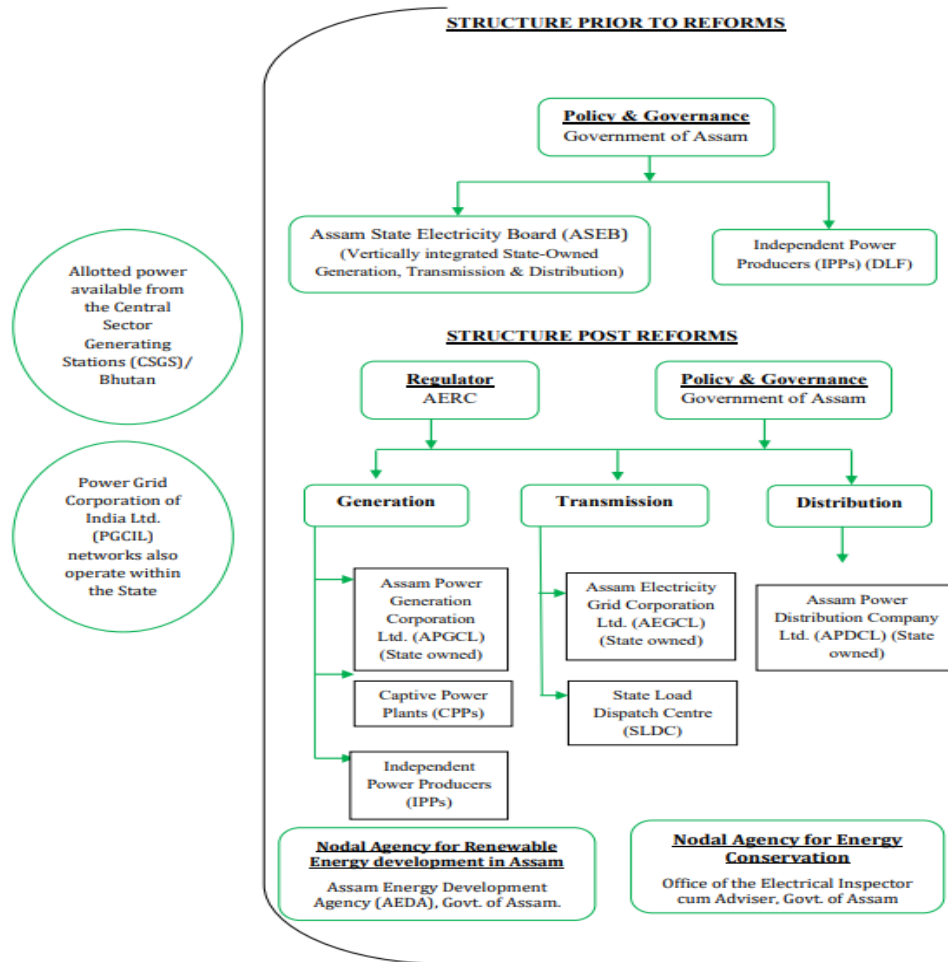
Electricity is the set of physical phenomena associated with the presence and motion of matter that has a property of electric charge. Electricity is related to magnetism, both being part of the phenomenon of electromagnetism, as described by Maxwell's equations. Various common phenomena are related to electricity, including lightning, static electricity, electric heating, electric discharges and many others (Wikipedia, 2020). Electricity consumption is the form of energy consumption that uses electric energy. Electric energy is the Actual energy demand made on existing electricity supply (wikipedia, 2020). Electricity has transformed the face of earth and changed the way people lived and worked beyond imagination in the past century. Electricity is one of the most important blessings that science has given to the mankind. It has also become a part of modern life and one cannot think of a world without it. Electricity has many uses in our day to day life. It is used for lighting rooms, working fans and domestic appliances like using electric stoves, A/C and more. All these provide comfort to people. In factories, large machines are worked with the help of electricity. Essential items like food, cloth, paper and many other things are the product of electricity. Modern means of transportation and communication have been revolutionized by it. Electric trains and battery cars are quick means of travel. Electricity also provides means of amusement, radio, television and cinema, which are the most popular forms of entertainment, are the result of electricity. Modern equipment like computers and robots have also been developed because of electricity. Electricity plays a pivotal role in the fields of medicines and surgery too – such as X-ray, ECG. The use of electricity is increasing day by day (The Hindu, 2020).

In the year 1600, English physician William Gilbert used the Latin word “electricus” to describe the force that certain substances exert when rubbed against each other. A few years later another English scientist, Thomas Browne, wrote several books and he used the word “electricity” to describe his investigations based on Gilbert's work (ATKINSON, 2014). Energy use is crucial to human survival and development. Improvements in lifestyles have historically been associated with increases in energy consumption and the access to appropriate energy services has always been seen as a necessary precondition for development (Pachauri, 2007). Electricity is vital in our economic activities and life. Energy is not merely an input material for production and business activities; it is also indispensable for residential lives. In modern society, commercial and industrial activities are closely linked with

electricity consumption (Zhaoguang Hu, 2013). (Thiede, 2012) shows that manufacturing company are facing diverse economic (e.g. shorter product life cycle, rising product variant diversity, increasing production volume fluctuations, rapid changing technologies, financial crisis) but also enormous environmental (e.g. climate change, resource depletion) and social challenges (e.g. aging personnel). (Alvi Sarowar, 2014) defined that, As technology is advancing the consumptions of power is steadily rising. There are three steps for proper electrification these are: - Electric Power generation, Electric Power Transmission, Electric Power Distribution. This three are equally important for proper electrification, without any one of this three the electricity system will be incomplete.

Traditionally, power distribution means is to provide power to individual consumer premises. Energy consumption, precisely the electrical energy has become a prerequisite for our everyday life.

Fig. 1.1:- Power Sector in Assam -An Overview.



Source: AERC ANNUAL REPORT FY 218-19

Assam Electricity Regulatory Commission (AERC)

Assam Electricity Regulatory Commission (AERC) is a regulator of electricity board of Assam was established under the Electricity Regulatory Commissions Act, 1998 (14 of 1998) on February 28, 2001 which main vision and mission are:

1. To ensure uninterrupted power supply at required voltages to all the consumers so that they can meet their requirements of power at affordable cost at any time, thereby the state can develop on the basis of such power supply.
2. To promote competition, efficiency and economy in the activities of the Electricity Industry within the State of Assam.

3. To regulate the power purchase and procurement process of the distribution utilities for sale, distribution and supply of electricity within the State of Assam.
4. To determine the tariff for electricity, wholesale, bulk, grid or retail, as the case may be, and the tariff payable for use of transmission facilities, within the State of Assam.
5. To encourage sustainable development by promoting renewable sources in power generation

Assam State Electricity Board

The Assam State Electricity Board (ASEB) is an electricity regulation board of the state of Assam in India. It is a Public Sector Undertaking managing the generation, transmission and distribution of electricity in the state of Assam with its successor companies Assam Power Generation Co. Ltd., Assam Electricity Grid Corporation Ltd. and Assam Power Distribution Company Limited.

Assam State Electricity Board was established in 1958 in the composite state of Assam under the Electricity Act 1948. The existing Board was reconstituted in 1975 after the state was trifurcated into Assam, Meghalaya and Mizoram in 1972. Two central government corporations, North Eastern Electric Power Corporation (NEEPCO) and the Power Grid Corporation of India Ltd (PGCIL) supplement the efforts of the state in power development in generation and transmission respectively.

Independent Power Producers (IPPs)

Independent Power Producers (IPPs) or non-utility generator (NUG) are **private entities** (under unbundled market), which own and or operate facilities to generate electricity and then sell it to a utility, central government buyer and end users.

Assam Electricity Regulatory Commission is a regulatory body which main mission and vision is to: promote competition, efficiency and economy in the activities of the Electricity Industry within the State of Assam. regulate the power purchase and procurement process of the distribution utilities for sale, distribution and supply of electricity within the State of Assam. determine the tariff for electricity, wholesale, bulk, grid or retail, as the case may be, and the tariff payable for use of transmission facilities, within the State of Assam. encourage sustainable development by promoting renewable sources in power generation.

To ensure uninterrupted power supply at required voltages to all the consumers so that they can meet their requirements of power at affordable cost at any time, thereby the state can develop on the basis of such power supply.

Generation Sector

APGCL is the successor corporate entity of erstwhile ASEB formed pursuant to the notification of the Government of Assam, for restructuring of ASEB under the Electricity Act 2003 (Central Act 36 of 2003). APGCL is a Company incorporated with the main object of generation of electricity in the State of Assam. Assam also receives power from the Central Sector Generating Station like NEEPCO, NTPC and NHPC located in the North Eastern and Eastern Region.

Status of Transmission System

Intra State Transmission System

Assam Electricity Grid Corporation Limited (AEGCL) is a State Public Sector Company registered under 'The Companies Act, 1956'. It was formed out of erstwhile Assam State Electricity Board (ASEB) in 2003 and was notified as the State Transmission Utility (STU). Its core business is to efficiently transport electrical power from electrical power bulk heads to the distribution company networks with the State.

Status Of The Distribution System

The Assam Power Distribution Company Limited (APDCL) is responsible for electricity distribution in the State of Assam having a consumer base of over 54.21 lakh consumers as on 31st March, 2019. APDCL is divided into 3 Regions, 8 Zones; 19 circles; 45 Divisions and 158 subdivisions.

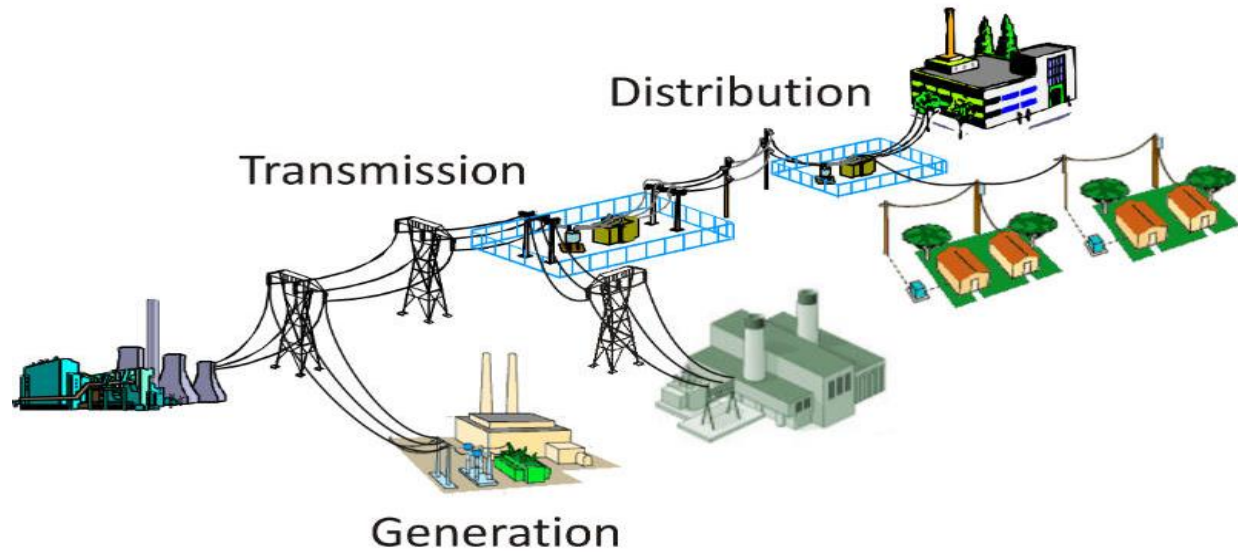


Fig: 1.2:- Electrification System.

About APDCL

Assam Power Distribution Company Limited (APDCL) is a public limited company whole owned by the Government of Assam. It was incorporated on the 23rd day of October 2009 and has been registered under Indian Companies Act 1956.

The main purpose of forming the Company was to take over, manage and operate the electricity distribution system, assets, liabilities, undertaking of the erstwhile Assam State Electricity Board (ASEB) pursuant to a notified transfer scheme in terms of Part XIII of the Electricity Act, 2003.

The primary purpose of the Company is to undertake distribution, trading and supply of electricity in the state of Assam or outside it in accordance with provisions of Applicable Law and all activities ancillary or appurtenant thereto. It has also the mandate to develop, maintain and operate the power distribution system in the state of Assam. In carrying out the work of supplying power, APDCL reaches every base of more than 33 lakhs. This is growing year by year. Power Purchase Power procurement of APDCL is predominantly dependent on the State Generating Stations of Assam Power Generation Company Limited (APGCL) and Central Generating Stations to meet its base load. Around 26% of power is allocated from hydro power stations with seasonal volatility. As such, in order to meet the peak demand of the State, APDCL was required to procure additional power on short-term basis through traders and from Power Exchanges Since APDCL is a public limited company and its main purpose is to distribute electricity in every corner of the state.

APDCL's sub – station can be divided into three regions

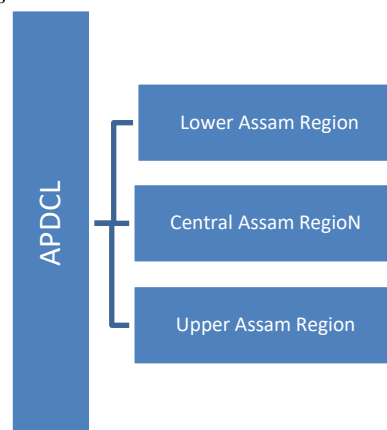


Fig: 1.3:- APDCL region wise.

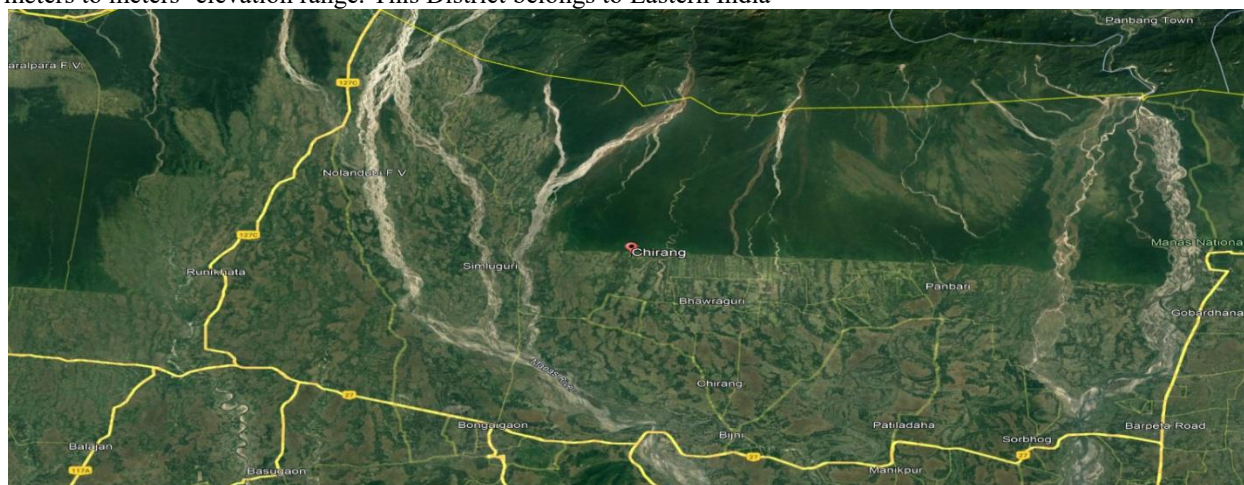
Under Bongaigaon Subdivision-II, there are total 5 sub-station & 33/11 kV transformer is used of load off-load tap changing.

Name of circle	Name of the Division	District in which located	Name of 33/11KV S/S	capacity of sub-station		
				No. of Transformer	No. of Transformer(MVA rating)	Total capacity (MVA)
Bongaigaon	Bongaigaon 2	Chirang	CHAPAGURI	2	2×5	10
			BENG TAL	2	2×5	10
			KAJALGAON	1	1×5	5
			SAMTHAIBARI	2	2×5	10
			DEOSRI	2	2×5	10

Area of the study:

According to the 2011 census Chirang district has a population of 482,162, roughly equal to the nation of Suriname. This gives it a ranking of 547th in India (out of a total of 640). The district has a population density of 244 inhabitants per square kilometre (630/sq. mi). Its population growth rate over the decade 2001-2011 was 11.26%. Chirang has a sex ratio of 969 females for every 1000 males, and a literacy rate of 64.71%. Bodos form the majority by about 32% while Muslims constitute 16%, Tea tribes 22% and 30% comprise others tribes and Assamese, Bengalis.

For the purpose of present study Bongaigaon Sub –Division 2 has been selected as field area, which cover Chirang district. Chirang District is one among 25 Districts of Assam State, India. Chirang District Administrative head quarter is Kajalgaon. It is Located 119 KM East towards State capital Dispur. It is smallest district in Assam State by population. It is Located at Latitude-26.6, Longitude-90.9. Chirang District is sharing border with Bongaigaon District to the west. Chirang District occupies an area of approximately 1169.9 square kilometres. It's in the 52 meters to meters' elevation range. This District belongs to Eastern India



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Objective of the Study:-

1. Analysis Connected load mix of Bongaigaon Sub-Division 2
2. Find the demand and supply gap of APDCL Assam
3. Find percentages changes of shortages, demand and availability of energy

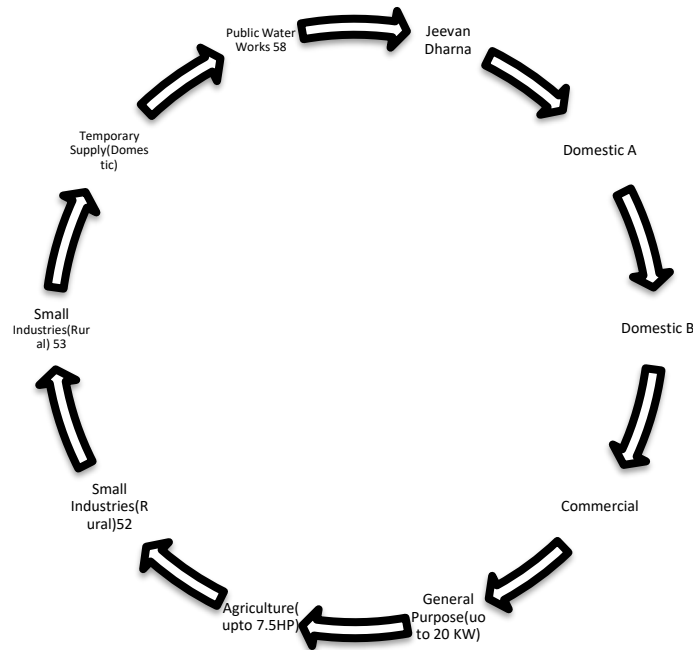
Tool for collecting of data:

The study is conducted in the Assam, under Bongaigaon sub-division 2. It is observed that most of the Urban and Rural people are having crisis of electricity. So to find out the shortages of electricity in Bongaigaon sub-division 2, this research has been taken.

The study is solely based on secondary data. This secondary data has been collected from various sources e.g. Journal, statistical handbook, web site, subs MRR sheets etc. In the study, we have used some statistical tools to prove or explain our study. Basic tools such as bar diagram, pie diagram, histogram, linear analysis, R^2 has used to explain objectives of the study and discuss the methodology.

Analysis of Objectives& data

This chapter deals with the various programs and function undertaken by the respected BONGAIGAON SUBDIVISION-2 AND ASSAM POWER DISTRIBUTION COMPANY LIMITED (APDCL) over different period of time.



Jeevan Dharna:

Supply of power to any premises exclusively for the purpose of own requirements with a Connected Load of not more than 0.5 kW and consumption up to 1 kWh/day or 30 kWh per month. If any Jeevan Dhara consumer consumes more than 30 units per month for 2 consecutive months, then such consumer should be transferred to Domestic A category and billed accordingly thereafter, irrespective of the number of units consumed. Domestic A: This tariff shall be applicable for supply of power to consumers having connected load below 5 kW for residential premises, exclusively for domestic purposes only. This shall also include supply of power to occupants of flats in multi-storied buildings

Domestic A:

Supply of power to consumers having connected load below 5 kW for residential premises, exclusively for domestic purposes only. This shall also include supply of power to occupants of flats in multi-storied buildings, if the premises have not been classified under Domestic B or HT Domestic and receiving bulk power at single point without any individual metering arrangements for domestic purposes.

Domestic B:

Supply of power to consumers having Connected Load of 5 kW and above up to 25 kW exclusively for domestic purposes only.

Commercial:

Supply of power to consumers having Connected Load up to 25 kW to all establishments and institutions of commercial nature and connected with trading activities, including commercial offices, Government and public sector commercial installations, commercial houses, optical houses, shops, hotels, restaurants, bars, refreshment stalls, showcases of advertisements, theatres, cinema halls, guest houses, laundries, dry-cleaners, Railway stations, public and private bus-stands not covered under any other category of consumers, copy works, X-ray installations, private nursing homes/clinical laboratories, photographic studios, battery charging units, workshops, petrol pumps, factory & printing presses not using motive power in the manufacturing process, private educational and cultural institutions, lodging and boarding houses.

General purpose supply:

Supply of power to consumers having Connected Load upto 25 kW to all Non-commercial and Non-domestic users of electric power like Government offices, Semi-Government Educational and cultural institutions, Government hospitals, dispensaries, Charitable institutions and Trusts (public or private formed solely for charitable or religious purposes), Dharamshalas, Non-commercial boarding and lodging houses and other Non-commercial institutions.

Agriculture:

Supply of power for agriculture / irrigation purpose in the agricultural sector having Connected Load upto 25 kW.

Small industry:

Supply of power for industrial purposes having licence from designated authority of appropriate Government and not covered under any other category, for consumers having Contract Demand/Connected Load upto 25 kW.

Temporary supply:

Electric supply of power at LT, which is temporary in nature for a period not exceeding one month.

Public water work: Public water supply maintained by Government or Government Corporations, Municipalities, Town Committees and Panchayats.

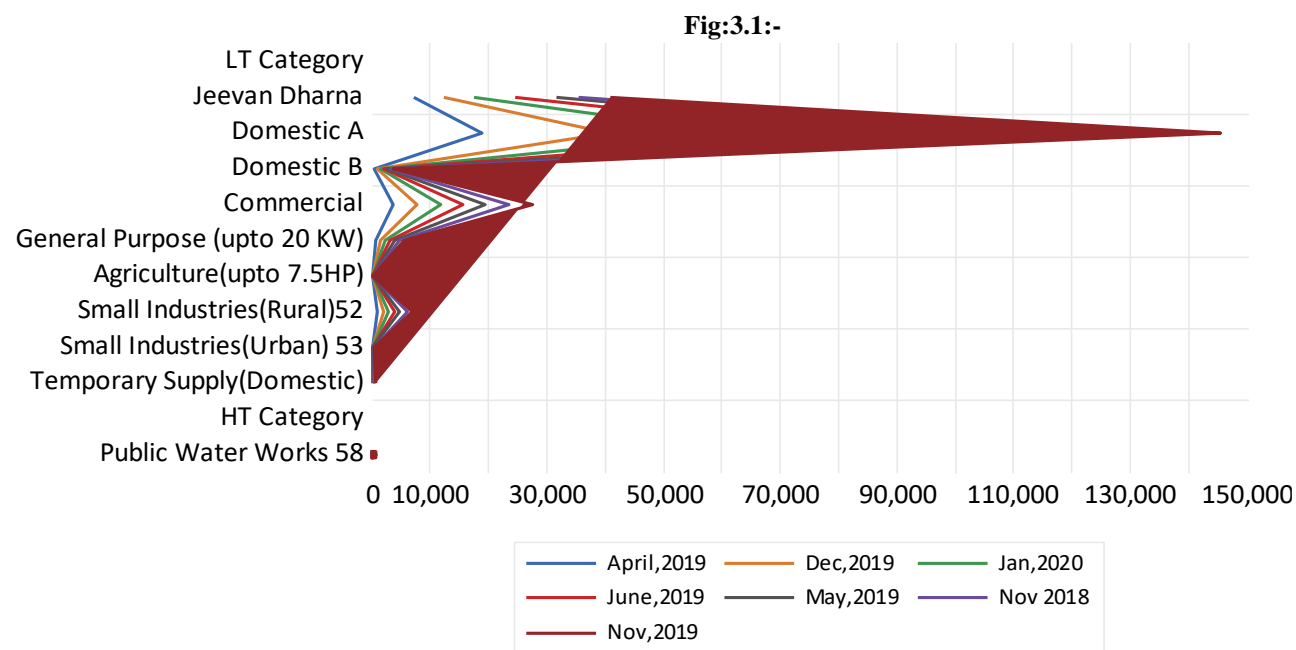
Connected load mix of Bongaigaon Sub-Division 2

In this we will analysis connected load of Bongaigaon Sub-Division 2, which distributes more than 11 items. And it can be divided into two categories: high tension or high voltage (HT) and Low tension (LT). Connected load: the total electric power-consuming rating of all devices (as lamps or motors) connected to a distribution system.

Table 3.1:- Connected load (KW)							
	Nov 2018	April,201 9	May,201 9	June,201 9	Nov,201 9	Dec,201 9	Jan,202 0
LT Category							
Jeevan Dharna	3784	7298.82	7189.98	6886.63	5540.85	5189.51	5094.99
Domestic A	23620	18761.68	18849.15	19196.04	21318.95	21780.5	21921.5 6
Domestic B	470.7	487.32	501.32	520.32	539.22	539.22	539.22
Commercial	4232	3696.72	3728.72	3766.72	3987.19	4056.19	4097.55
General Purpose (upto 20 KW)	891	756.11	758.11	758.11	796.11	802.11	804.11
Agriculture(upto 7.5HP)	11	4	4	4	4	4	4
Small Industries(Rural)52	1158	962.15	962.15	962.15	962.15	977.15	977.15
Small Industries(Urban) 53	69.87	53.87	53.87	53.87	53.87	53.87	53.87
Temporary Supply(Domestic)	0	59	32	16	97	377	59
HT Category							

Public Water Works 58	12	14	14	14	18	18	18
Source: BESD-II							

From the chart it can be seen that although almost 69% of the total consumers belongs to domestic A category, on the other hand Jeevan Dharna, commercial, domestic B, small industries(Rural), general purpose (upto 20KW) categories accounted for 11%, 12%, 1%, 4%, 3% November, 2018.



Above chart shows that Domestic A decrease to 58% but Jeevan Dharna increased to 23% and other remained same in April, 2019.

In May, 2019 there is increase in Domestic A e.g. 59% from 58% but Jeevan Dharna decreased to 22% and remaining same.

In June, there is large increase in Domestic A 60% also there is decreased in Domestic B, Jeevan Dharna 21%, 2%, but small industries and general purpose (upto 20KW) increase to 3% 2% and other remain same.

Again Domestic A, general purpose (upto 20KW), small industries(Rural) decline 69% to 64%, 3% - 2%, 4% - 3% in November 2019, but there is increase in Domestic B, Jeevan Dharna, 2% and 17%. As compared to November, 2019 Domestic A increased 64% - 65% but Domestic B, Commercial, small industries, general purpose (upto 20KW) remain same, on the other hand Jeevan Dharna decreased 17% - 15% in December 2019.

January, 2020, MRR shows that Domestic A, Jeevan Dharna, commercial, small industries (Rural) remain same remain same, but general purpose (upto 20 KW) increase to 3%.

Table: 3.2:- TOTAL CONSUMER REGULAR							
CATEGORY/YEAR&MONT	Nov-18	Apr-19	May-19	Jun-19	Nov-19	Dec-19	Jan-20
JEEVAN DHARNA	5336	16287	16171	15487	11314	10298	10324
DOMESTIC A	23262	24305	24305	24626	27555	28219	28129
DOMESTIC B	46	54	54	55	52	51	51
COMMERCIAL	1221	1321	1288	1267	1183	1228	1211
GENERAL PURPOSE(UPTO 20KW)	202	192	194	200	196	200	201

AGRICULTURE(UPTO 7.5HP)	4	3	3	3	3	3	3
SMALL INDUSTRIES(RURAL) 52	71	78	78	77	64	64	61
SMALL INDUSTRIES(URBAN) 53	6	4	4	4	4	4	3
TEMPORARY SUPPLY (DOMESTIC)	0	31	31	14	25	25	22
HT CATEGORY							
PUBLIC WATER WORKS 58	1	2	2	2	3	3	3

Source: MRR SHEET OF BESD-II

Fig: 3.3 shows that consumer in different month in different category, in Nov18 domestic –A was 60% where in april19 was 58 %, it is due to increase of consumption of electricity (above 5KW) from domestic –A to Domestic-B. Diagram 1,2,3,4,5,6,7 shows that there are no increases in commercial, agriculture, small industry (rural), (urban). Here TDC means consumer those are only for short period of time, some consumer is not regular consumer of electricity sometimes they don't consume for a month e.g. Automobiles, School, Colleges, Insurance companies etc.

Demand and supply gap of APDCL Assam

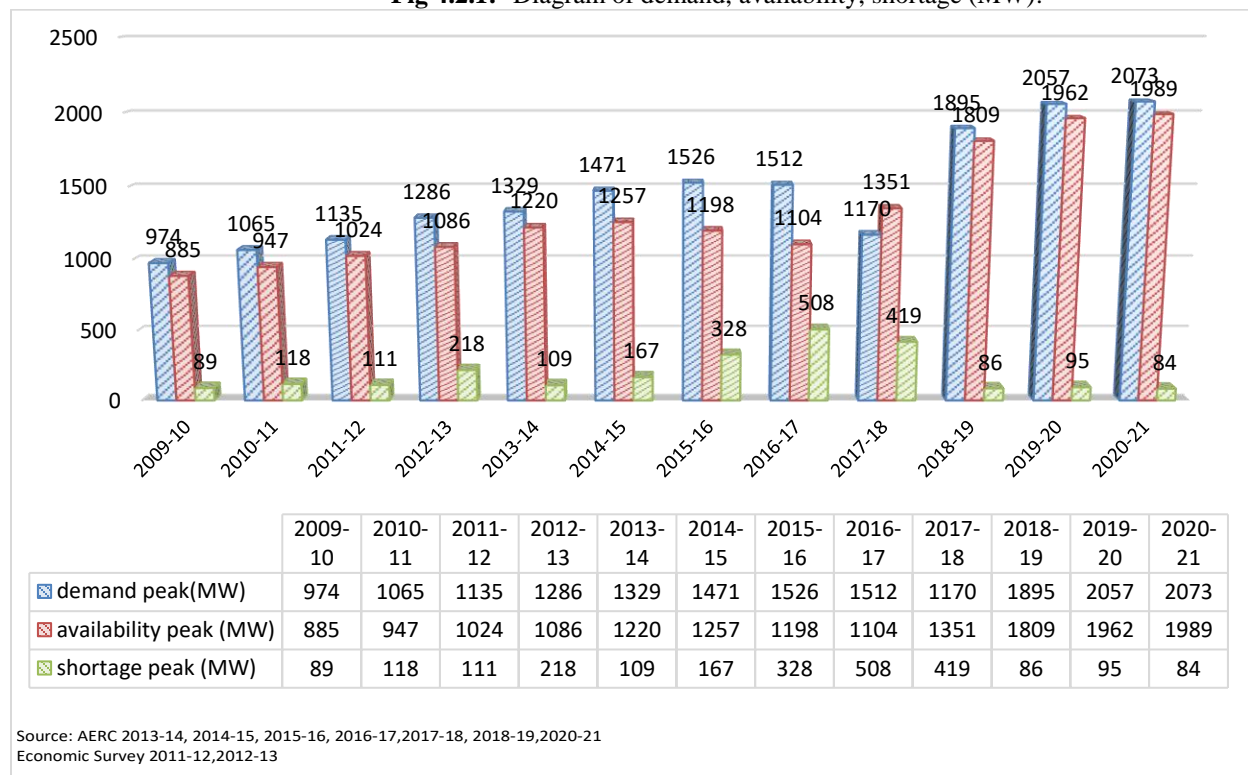
Assam Power Distribution Company Limited (APDCL) is mandated to supply electricity to all consumers of the state of Assam. The company has made all out endeavour to improve power supply position of the state and is now supplying power to the extent of 95% to 100% during Off- peak hours and to 90 to 95 % during Peak (evening) hours. However, the company expresses its regret to its esteemed consumers for occasional power shortage situation faced due to reasons beyond the reasonable control of the company. It is a fact that there has been a steep increase of demand for power during the last 3-4 years in the state. In Guwahati alone in the past five years, there has been a threefold increase in demand for power. Until a couple of years back, only 16% rural households were electrified, which has now enhanced to about 50%; but as per the National Electricity Policy, steps have been undertaken to electrify every household of Assam by the year 2019. As such, there has been a great increase in demand for power in the rural as well as urban areas in recent times.

Also with the increased development and better economic activities during the last few years, this year, Assam has been experiencing an average peak demand for power to the tune of 1400 MW. This is approximately 2 (two) times what it was five years ago. It is a matter of cheer that the 726 MW OTPC power project located at Palatana in Tripura has now been commissioned to generate and Assam is getting its share to a tune of 200MW which has contributed in reducing demand supply gap. Further, to tide over this shortfall due to increasing demand APDCL is exploring different sources of power. In this endeavor, APDCL has managed to procure power from DVC and NTPC to avoid inconvenience of loads shading to the esteemed consumers.

Till now, Assam is mainly dependent on hydro generations. This is about 60% of the total existing availability. Most of these hydro generators are sourced through Run of the River (RoR) which are solely dependent on the rainfall in the respective catchments areas. It was expected that these hydro generators would pick up to 100% of its capacity during this monsoon. Also, the gas based thermal power stations are generating far below their full capacity due to inadequate supply of gas etc. The total availability of power, at present, is around 1200 MW including State's own generations of about 260 MW. APDCL is making efforts to minimize this 200 MW deficit by procuring 100-150 MW from the open market. Efforts are also being made to enhance the percentage allocation of power to Assam from unallocated source in the Eastern Region. We expect that this would add up to some extent to minimize the demand-availability gap of power in Assam. The much awaited NTPC, Bongaigaon has started its commercial operation from 2nd April, 2016. The share of Assam from this station is around 56%. With the synchronization of the first 250MW unit at Bongaigaon, the availability of power for APDCL has increased by around 130 MW.

State's Power Availability and Shortage

Fig: 4.2.1 shows year wise demand, availability, and shortages of electricity in Assam which was distributed by APDCL. A comparison of the average peak availability and shortages for the years 2013-14 up to 2020-21 is given in chart below:

Fig 4.2.1:- Diagram of demand, availability, shortage (MW).

While peak demand increased over the years from FY 2009-10 to FY 2020-21, peak availability also increased in FY 2018-19 by 458 MW from 1351 MW in FY 2017-18, 2021-20 to 2020-21 by 72 MW. There was a decline in peak shortage in FY 2018-19 over FY 2017-18 by an average of 333 MW. From FY 2009-10 to FY 2018-19 shortages were increase but it has decline later from FY 2016-17 to FY 2018-19. After 2018-19 there is rapid increases on demand and also to meet demand availability are also increases.

In electricity, peak can be divided into two categories e.g. peak and off peak.

1. Peak/daytimes: 6am-8pm
2. Off-peak/ night time: 8pm-6am

Both the peak and off demand and availability for FY 2018-19 is shown in the table and chart below:

Table:4.2.2

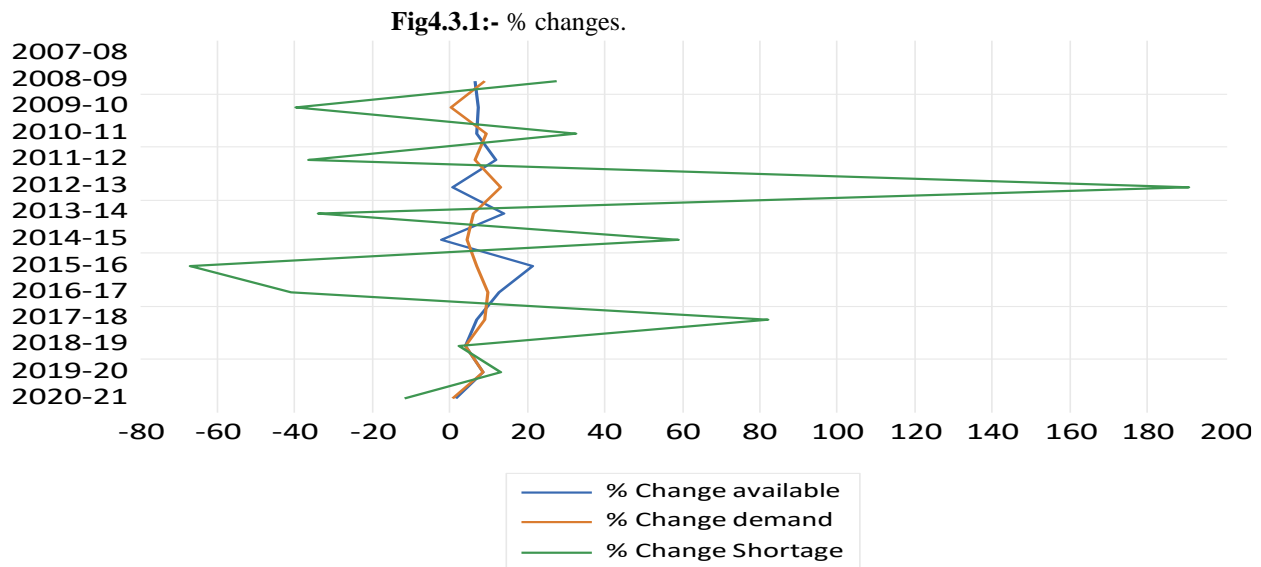
Source: AERC 201819		
Particular	Peak	Off peak
Demand (MW)	1895	1388
Availability(MW)	1809	1339
Shortage(MW)	86	49

Table:4.2.3

Source: AERC 2017-18		
Particular	peak	Off peak
Demand(MW)	1770	1230
Availability(MW)	1351	1116
Shortage(MW)	419	114

APDCL tried to overcome its power shortages through purchase from the Power Exchanges, Deviation Settlement Mechanism (DSM) and traders.

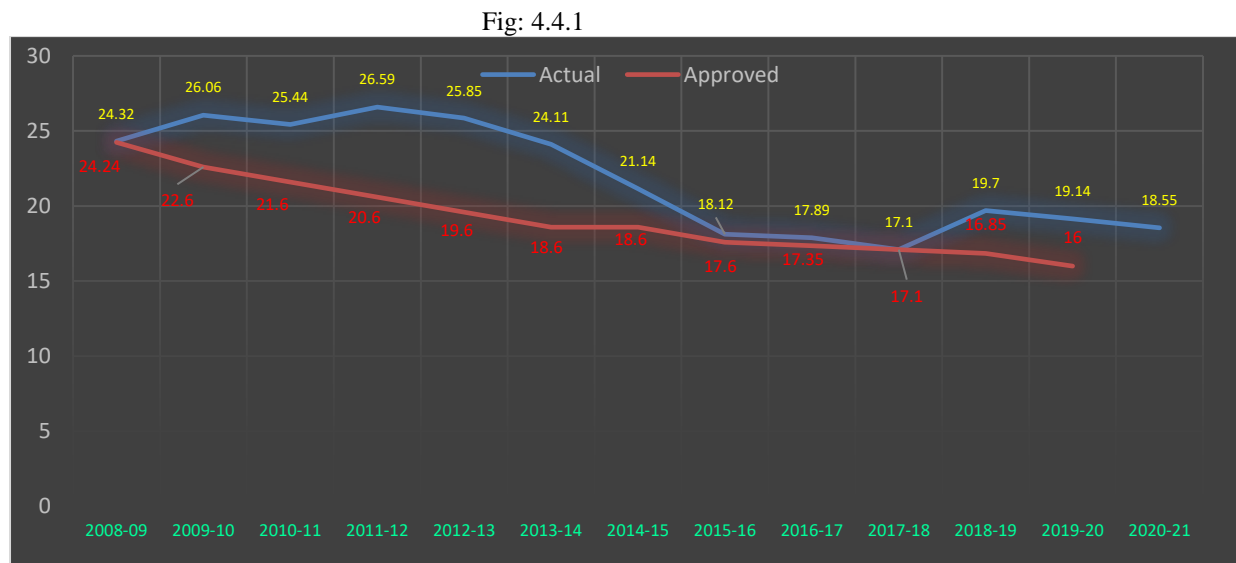
4.3 percentages changes of shortages, demand and availability of energy



From the above fig we can see that there is a huge change in the year 2012-13 highest energy shortages. While in year 2007-08, 2010-11, 2015-16, 2018-19, 2019-20 and 2020-21 no negative shortages (Data are extracted from Eviews12)

Distribution Loss

Distribution losses occur in the process of supplying electricity to consumers due to technical and commercial reasons. The trend in loss reduction since last 13 years from 2008-09 upto 2020-21 is indicated in the chart



Source: AERC

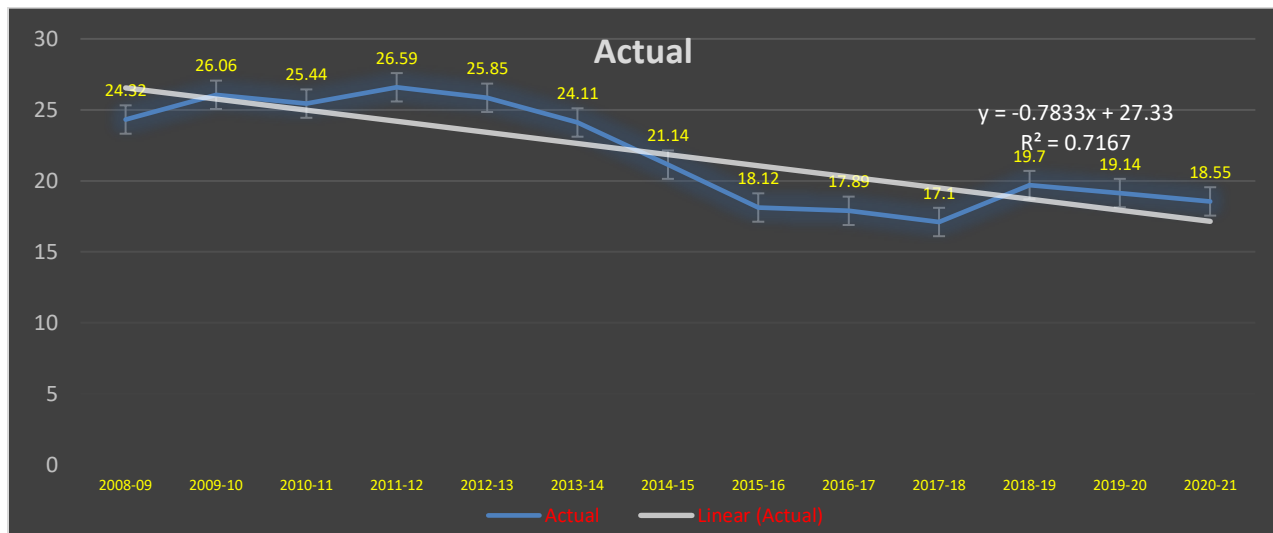
APDCL, in its Petition, submitted that it has achieved distribution loss level of 19.70% in FY 2018-19, as against the approved level of 16.85%. The actual distribution loss has decreased to 17.01% in FY 2017-18 from 24.32% in FY 2008-09. The improvement in distribution loss is a result of continuous monitoring by the Commission and the distribution licensee APDCL submitted that the actual Distribution Loss for FY 2018-19 is significantly higher than

the loss level of FY 2017-18. On the other hand, the approved distribution loss keeps decreased to 16.85% in FY 2018-19 from 24.24% in FY 2008-09. APDCL stated that the increments over respective previous years are primarily on account of enhancement of Low Tension (LT) networks under RGGVY/DDUGJY without adequate High Tension (HT) infrastructure. Further, in FY 2018-19 due to implementation of massive household electrification carried out under Govt. of India's flagship programme SAUBHAGYA, the losses have increased.

Trends Analysis

Trend line with intercept and parameters including r- square.

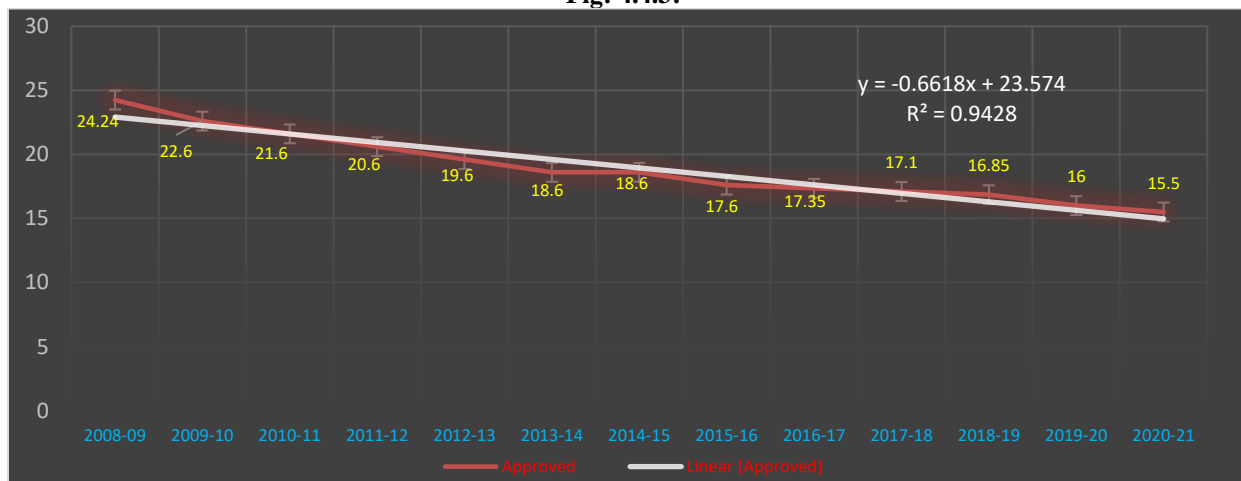
Fig .4.4.2



By using Regression Equation in trend line we can show the linear line, intercept and parameters including r- square. Here $y = -0.783x + 27.33$
 $R^2 = 0.716$

That means $a = 27.33$ which is intercept term or coefficient and $-0.783x$ is trend or coefficient. It means that on an average i.e. the mean value of the variable (independent variable) and $-0.783x$ is the trend i.e. at what rate it is increasing or decreasing over time. Here it shows it is decreasing over time for the period (ex. 2000-2008) at the rate of $-0.783x$ per annum or as per data format. $R^2 = 0.716$ means the relationship between these two variables is explained 71% or the dependent variable explains the dependent variable by 71%.

Fig: 4.4.3:-



Here $y = -0.661x + 23.57$

That means $a = 23.57$ which is intercept term or coefficient and $-0.661x$ is trend or coefficient. It means that on an average i.e. the main value of the variable (independent variable) and -0.7155 is trend i.e. at what rate it is increasing or decreasing over time. Here it shows it is decreasing over time for the period (ex. 2000-2008) at the rate of $0.661x$ per annum or as per data format. $R^2 = 0.942$ means the relationship between these two dependent variable by 94%.

Finding, Recommendation & Conclusion:-

Findings:-

Electricity is the power that driving the whole world. Now a days we cannot think even a moment without electricity. Without electricity the civilization will go back to the thousands of epochs. In our state Assam Electricity Regulatory Commission (AERC) is the mother organization in electricity power sector. AERC regulate all company in electric power sector.

1. As the availability status in Assam where electric energy requirement is always higher than the availability electrical energy. In 2013-14 demand was 1329 million unit (MU) and availability was 1220 MU, there was shortages of 109 MU. In 2016-17, energy requirement was 1612 MU and availability was only 1104 MU, the shortages of electricity were 504 MU highest in last 7 years.
2. APDCL is divided into 3 Regions, 8 Zones; 19 circles; 45 Divisions and 158 subdivisions. Among 158 subdivision Bongaigaon subdivision-2, is among them which falls in lower Assam region. BESD –II, cover total 5 sub stations and distribute electric to more than 43120 consumers (MRR, Jan, 2020). As monthly revenue return (MRR) shows that Domestic-A, consumer is more than other consumers, as per November 2018, MRR Domestic- A consumer was 60% where Jeevan Dharna 21%, commercial 12%, small industries (Rural) 3%, general purpose (upto 20KW) 2%. It has been seen that Domestic –A is increasing to 65% in January 2020, and decrease in Jeevan Dharna to 15%, but from the MRR it has observed that Commercial remain constant 14%.
3. Also studies shows that peak consume are more that off peak. 1809MW peak and 1339 MW off peak (2018-19) and 1351 MW peak and 1116 MW off peak in (2017-18).

Conclusion:-

Electrical distribution systems are an essential part of the electrical power system. Under Bongaigaon subdivision-II, most consumers are in rural area. There is no denial to the fact that electricity is needed for rural areas not just for lighting but accomplishing many framing operations done by the machines. Without the help of power supply the farmers work can get delayed. Which can hamper them in their work. Therefore, Chirang district needs 24×7 power supply, which will help the farmers in their work e.g. to run the water pump, and it can also help the people living in the village. E.g. electricity is also important for students, and electricity in rural area also ensures the safety of the people. It is the one of the most important element in bringing change and development in our society.

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