

Extensive Service Quality of Domestic Power Supply in Kerala

A study in the Vantage of Total Household Electrification in Kerala.

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Abstract

Service Quality is a topic of vigorous discussion among academicians and scholars in Kerala State where consumers are relatively more conscious about the cost, price and value aspects of products or services they consume. KSEB, a sparkling power utility in the rapidly growing Indian power sector, is the sole power supplier in Kerala. This study proposes to examine the service quality of KSEB in domestic power supply and the satisfaction level of power consumers in Kerala. As a part of the study, a new model of service quality, the “Extensive Service Quality” (ESQ) has been developed by integrating Power Quality and Cost Quality to the basic SERVQUAL (RATER) framework to have a better dimension of consumer satisfaction. The Study is based on both primary and Secondary data of perception of domestic consumers. ESQ Gap Analysis is used as the main tool of analysis of data. ESQ Mean Score of consumer perception indicates that they are moderately satisfied in the domestic power supply services. ESQ model may be a buttress to Power and other similar utilities in their road towards ‘affordable excellence’.

Key Words: *Extensive Service Quality (ESQ), Domestic Power Supply, Kerala State Electricity Board.*

1. Introduction

“India is on its way to becoming a global economic powerhouse, and energy will lie at the heart of this transformation” (Michael Waldron, EIA, 2017). Power Sector takes part a prominent role in the economic growth and development of any country. Power consumption is the most important index for measuring the phase of development of a country. Power generation and consumption are the vital components of infrastructure and crucial for the welfare of the Nations. India’s power sector is one of the most diversified in the world. According to ‘the key world energy statistics’ published by International Energy Agency (IEA) in 2019, India is the third largest producer of electricity in the world. Now India transfigured into energy surplus country’ from ‘energy deficit country’. Kerala state is the first state in India which achieved total electrification of households while most of other states

struggling for rural and village electrification. The credit of total electrification is indebted to the KSEB Ltd. Kerala State Electricity Board was constituted in 1957 for carrying out the business of electricity power generation, power transmission and power distribution in Kerala State with an envision to be the best power utility in India. Its mission is “to provide quality electricity to Consumers adequately, safely, sustainably at affordable cost”. The Board inciting the overall advancement of Kerala State.

The state of Kerala is popularly known as a consumer state. Besides the state is benchmarked its position in terms of literacy. Kerala is also well known for standard of living of the people. Most of the consumers are cost, value and quality conscious in Kerala. KSEB is formed as natural monopoly and its acts are said to be of self-centred nature and there arise an allegation that they impose heavy burden of cost on the consumers. KSEB has nearly 1.3 crore consumer base in Kerala. Kerala bagged “National Energy Conservation Award” for its remarkable performance in the field of power sectors in India. Domestic Power supply means the supply of electricity for household uses. This study making an attempt to study the service quality in domestic power supply and thereby, the satisfaction level of domestic consumers.

1.1 Extensive Service Quality (ESQ)

Consumer satisfaction basically related to service quality. When an entity meets and exceed the expectation of consumers there is said to be service quality. Even though the KSEB is established for carrying out the power business for profit through their profit centres, it is essential to have a look on its overall service form the side of consumers because it is a public utility organisation established by the government. Consumer satisfaction is wider concept that consists service quality and other attributes related to consumer perceptions such as price of the product, quality of the product etc., So in this study along with the service quality, the influence of other important aspects such as power quality, power cost quality on consumer satisfaction of KSEB are also evaluated. So, the study introducing the ‘Extensive Service Quality’(ESQ) Model which is a comprehensive analysis of service quality, Power quality and Quality of cost of power.

$$ESQ = SQ + PQ + CQ$$

(where ESQ= Extensive Service quality, SQ = Service Quality, PQ = Power quality and CQ= Cost quality)

2. Literature Review

World Bank Study Report (2011)², reported that Kerala is showing a bench marking performance in Indian power/electricity sector in terms of profit after tax (PAT), minimum Aggregate technical and commercial losses (AT&C-14% only), maximum metered power connection, low electricity theft etc.,

Severin Bornstein (2002)⁴ opined that restructuring of electricity market is more complex than other markets like oil market, gas market, airline/transport market etc, because of its unusual market combination of extreme inelastic supply and demand.

IIM, Kozhikode (2015)¹⁰, through their KSEB’s Customer perception survey pointed out that customer satisfaction index in rural area is higher than the urban area and it shows that expectation of urban consumers is more than that of rural consumers.

Jain et al(2010)¹¹, with an intension to study the performance efficiency of power sector utilities of thirty states in India for the year 2007-08, applied Data Envelopment Analysis (DEA) model with one input and two output variables. Total cost was taken as input variable and unit of energy and total energy consumption as output variables and study results established the role of cost benchmarking in the cost control of power utilities in India.

Sumir Lal (2005)¹⁴ through his case study argued that the weakness of Indian power sector reforms that it has failed to improve the equation between reformed utilities and their consumers. Sumir Lal also indicated that only energy efficient utilities can survive in coming competitive power market.

Power Finance Corporation data for (2003–11)¹⁵, Ranked KSEB as one of top utilities in India which are directly serving consumers by considering its performance consistency. In 2010, Kerala bagged National Energy Conservation Award for its remarkable performance in the field.

Ranganathan (2004)²⁰ has presented that the Electricity Act,2003 offered a vast possibility in power sector which will results into competition in generation and privatization in distribution of power but a proper homework for addressing the upcoming issue is lacking.

Thakur (2005)²¹, In the study by using Data Envelopment Analysis Model he compared the cost efficiencies of almost all state-owned power sector utilities in India and clearly pointed out the area of performance strength and weakness of power utilities in India. The study thrown light towards the future possibilities of massive cost reduction of power utilities.

Benadino.et. al (2020)²², analyzed the factors effecting the efficiency of public lighting in Spain. The study revealed that with regard to public lighting, efficiency of public management is more than that of private and mixed management and the efficiency of local government with highest revenue budget is enhancing year after year.

3. Relevance of the Study

Electricity power is inevitable part of human life. As the living standard of people enhances, requirement of power also increases. Even though there is face shift of energy generation and sources, the power consumption increasing day by day. Power demand in the country has increased at higher rate and is expected to rise in the coming years. Now, Consumption patten, mode of educational service, alternate fuel for transportation and so on, every aspects of rural life demanding electricity or other form of innovative energy. To meet the growing as well as emerging demand of power in rural sector the power utilities required to invest more in power generation and distribution. Whereas, most of the power utilities in India were under the blame of underinvestment in power generation and distribution due to their poor financial position and this leading to poor upkeep and maintenance of assets, particularly in rural areas. Therefore, strengthening and augmentation of sub - transmission & distribution infrastructure is also considered necessary to ensure reliable and quality power supply in rural areas. The Government of India has launched the scheme “Deendayal Upadhyaya Gram Jyoti Yojana” for rural / village electrification and providing electricity distribution infrastructure in the rural areas has been subsumed in the DDUGJY scheme. This project was declared as successfully completed in Kerala on May 29th 2017 one year before the deadline for the completion of the programme, May 2018. Government of India claimed that the programme successfully completed in April.2018. Despite this, several news reports argued that the numbers were inflated, and villages were electrified only on paper. These arguments have to be verified up to an extend and with the massive changes in power generation,

transmission and distribution sectors of the country, the power utilities sectors are required to be sufficiently competent to meet the expectations of the consumers, quality power at lowest cost.

4. Research Problem

Since Kerala is a consumer state, the consumers are more cost-value-quality conscious. The state acclaimed appreciation with respect of 100 per cent urban as well as rural electrification. Even though Kerala State Electricity Board claiming that it provides quality electricity power at lowest cost as it visions and mission envisages, the frequent increases of power price were evident in Kerala. More over there is a negative remark on KSEB that it is more self-centred. KSEB is public utility concern which has a huge customer base of 1.3 crore. After the appreciable implementation of DDUGJY, KSEB focuses to provide quality, reliable and uninterrupted power supply to consumers and to improve efficiency and quality of its services. In this context it is crucial to study how the domestic consumers are perceiving the 'so-called quality services of KSEB'.

5. Objectives of the Study.

There are two objectives in the present study.

1. To analyze the Extensive Service Quality (ESQ) of Kerala State Electricity Board as perceived by the Domestic Consumers.
2. To compare the level of overall satisfaction of Urban and Rural Domestic Consumers.

6. Hypotheses.

There are two hypotheses set for the study.

1. H_01 : There is no significant differences in the service quality expected and experienced by the household consumers of KSEB.
2. H_02 : *The* overall service satisfaction level is homogeneous in urban and rural domestic consumers of KSEB.

7. Research Methodology.

The research design of this study structured as:

7.1 Research Approach

The research approach used for the study is survey method. The study is basically a descriptive research design.

7.2 Sampling size

The sample size is limited to 100 domestic/household consumers of Kozhikode district in Kerala. Out of 100 samples 50 samples drawn from two urban domestic consumers and 50 from two rural domestic consumer.

7.3 Sampling technique

The sampling technique adhered by the study is simple random sampling.

7.4 Collection of Data

In the study primary and secondary data sources were used. The primary data were collected by serving questionnaire among power consumers and secondary data were collected from books, websites of KSEB, CERC, KSERC, IEA, and various articles and other publications.

7.5 Tools of analysis

Service quality is analyzed by using Gap Analysis model with 'RATER' variables and the difference in urban and rural consumer satisfaction is analyzed through Chi-Square test. Tables, Radar chart and the picture model of ESQ are also used in the study

Scope of the study

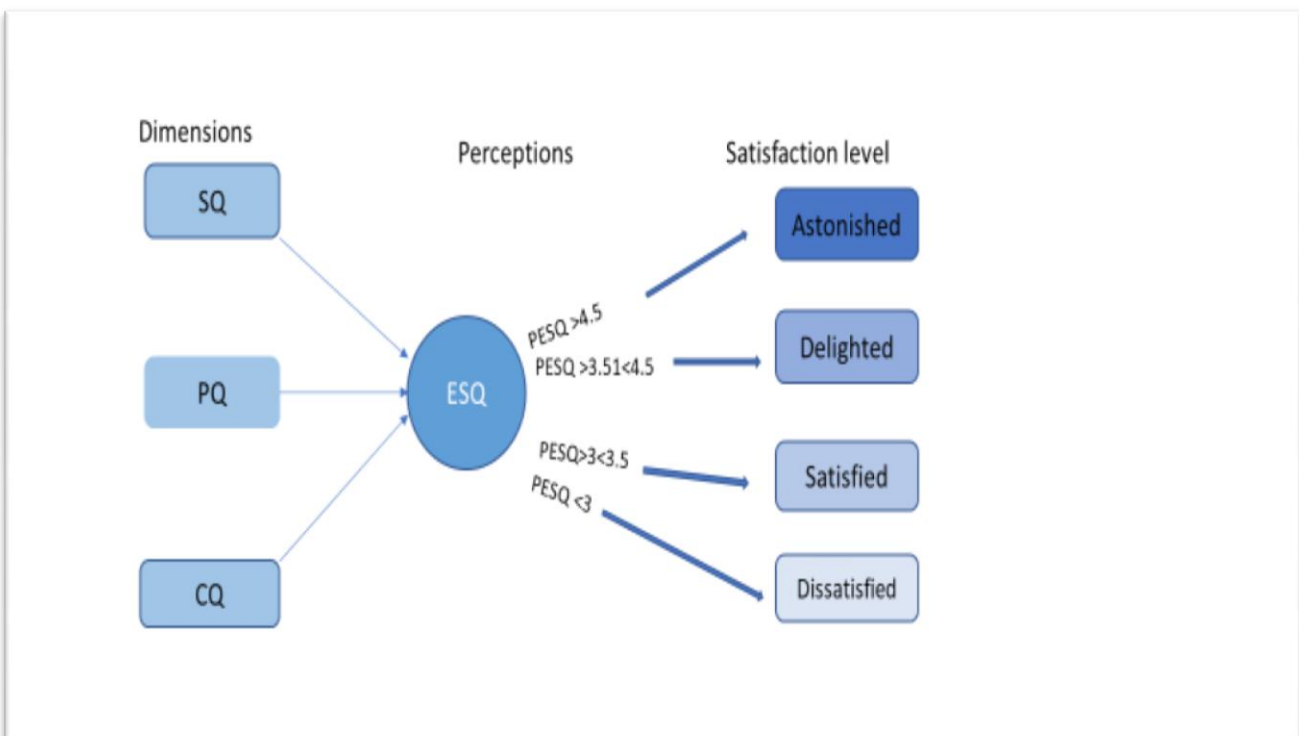
The study covers a survey conducted among the urban as well as rural domestic consumers in Kozhikode District for analyzing their perceptions towards Extensive Service quality (ESQ) of KSEB.

8. Results and Discussion

The core aim of the study is to analyse the effect of service quality, power quality, power cost and re-instatement of power supply on KSEB's domestic consumer satisfaction. In this model, along with the service quality of power utility concern its power (product of power utilities) quality and Cost (amount charged by power utility concern from its consumer are also studied.

- I. Service quality
- II Power quality
- III. Cost Quality

Figure 8.1. Extensive Service Quality (ESQ) Model



PESQ: Perceived Extensive Service Quality

8.I. Service Quality

Service Quality in this study followed user-based definition i.e., quality of service is lie in view of beholder who considers service quality as their satisfaction rate. Popular SERVQUAL developed by A. Parasuraman, Valarie A. Zeithaml and Len Berry with RATER dimensions: Tangibles, Reliability, Responsiveness, Assurance and Empathy are utilized here.

8.II. Power Quality

Power Quality (PQ) in this study means the voltage stability and the pace with which the KSEB re-instate power supply in the occasions of domestic power supply disturbances. Consumers perception regarding power quality were obtained in the rating scale of 5 to 1 and consumers agreements are rated as in the case of SQ analysis mentioned above.

8. III. Cost Quality

Cost Quality here means the affordability of power cost charged by the KSEB from domestic consumers and better payment options and facilities provided for remitting cost of power (billed amount).

Opinion relating to perceived service quality were obtained in the rating scale of 5 to 1. The highest point, 5 represents ‘strongly agree’ and lowest point, 1 represents ‘strongly disagree’. Gap between expected services and perceived services are assessed to find out the causes of consumer satisfaction or dissatisfaction on the services provided by the KSEB.

H₀1: *There is no significant differences in the Extensive service quality expected and experienced by the household consumers of KSEB.*

Table 8.1. ESQ Score for KSEB

I. Service quality Statements	Perception							Mean score
	SA (5)	A (4)	N (3)	D (2)	S D (1)	Total	TS	
Tangibility								
<i>Modern looking equipment</i>	15	8	38	20	19	100	280	3.42
<i>Facilities visually appealing</i>	18	41	41	0	0	100	377	
<i>Employees are well Dressed and appear neat</i>	47	39	8	6	0	100	427	
<i>Materials visually appealing</i>	6	10	53	24	7	100	284	
Reliability								
<i>Promise to do things at right time</i>	15	25	18	25	17	100	296	3.03
<i>Show sincere interest to solve problem</i>	22	34	16	17	11	100	339	
<i>Get the things right without repeat</i>	10	8	12	36	34	100	224	
<i>Error free records</i>	18	36	29	13	4	100	351	
Assurance								
<i>Staff instil confidence</i>	24	24	12	24	16	100	316	3.43
<i>Safe in dealing with Employees</i>	24	24	12	24	16	100	368	
<i>Staff are courteous</i>	29	34	6	18	13	100	348	

<i>Staff have knowledge</i>	19	35	24	12	10	100	341	
Responsiveness								
<i>Staff are expected to tell exactly when service is performed</i>	27	25	35	13	0	100	366	2.78
<i>Provide prompt service</i>	9	19	13	36	23	100	251	
<i>Staff are always willing to help Consumers</i>	9	8	28	40	15	100	256	
<i>Staff always respond to Consumers request</i>	9	8	21	38	24	100	240	
Empathy								
<i>Give individual attention</i>	15	14	16	20	35	100	254	2.74
<i>Operating hours are convenient</i>	30	32	15	16	7	100	362	
<i>Understand specific needs</i>	16	10	5	40	29	100	244	
<i>Employees giving heartfelt treatment to Consumers.</i>	11	8	17	35	29	100	237	
II. Power Quality Statement								
<i>Voltage stability</i>	23	34	10	18	15	100	217	2.82
<i>Re-instatement of Power supply</i>	29	31	8	22	10	100	347	
III. Cost Quality Statement								
<i>Affordable Cost (Power Charge)</i>	11	38	9	30	12	100	306	3.32
<i>Cost/Bill payment flexibility</i>	20	48	9	16	7	100	358	

SA= Strongly Agreed, A=Agreed, N=Neutral, D=Disagreed, SD=Strongly Disagreed and TS=Total Score

Table 8.2 Gap Score for KSEB with their relative ranking

<i>ESQ</i>	<i>Dimensions</i>	<i>Expected Max Score</i>	<i>Perceived mean Score</i>	<i>Average Gap Score ESQ dimensions (AGS)</i>
<i>SQ</i>	<i>Tangibility</i>	5.00	3.42	-1.58
	<i>Reliability</i>	5.00	3.03	-1.97
	<i>Assurance</i>	5.00	3.43	-1.57
	<i>Responsiveness</i>	5.00	2.78	-2.22
	<i>Empathy</i>	5.00	2.74	-2.26
Average SERVQUAL (gap)score =\sum AGS/5				1.92
<i>PQ</i>	<i>Power quality</i>	5.00	2.82	-2.18
<i>CQ</i>	<i>Cost quality</i>	5.00	3.32	-1.68

ESQ Gap Mean score=(SQ score+ PQ score+ CQ Score) /3 = (1.92+2.18+1.68)/3 = **-1.92**

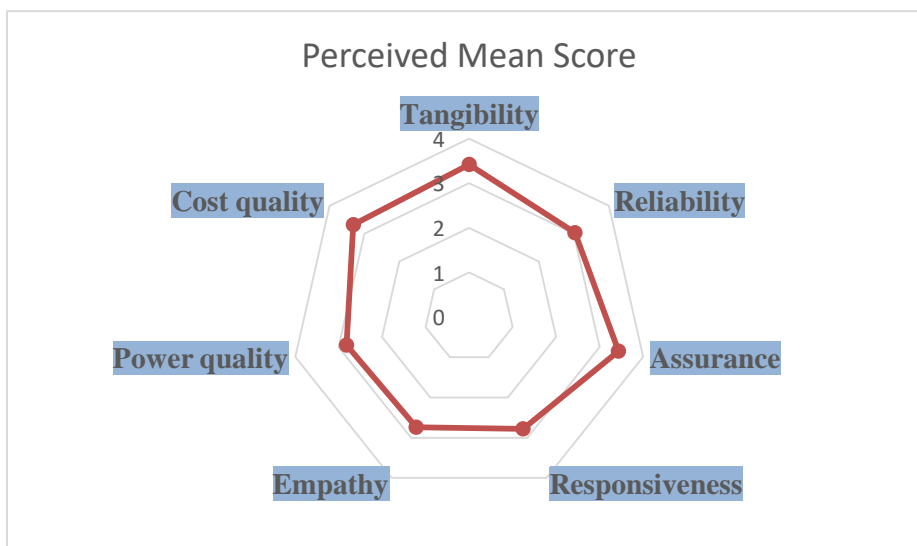
It is clear that there is a gap in between consumers Extensive Service quality expectation and Extensive Service Quality perception. Hence H_0 rejected. H_1 , ‘*there is significant differences in the Extensive service quality expected and experienced by the household consumers of KSEB*’ is accepted. In this analysis, SQ gap score and ESQ gap score came to be same, ie.1.92. While comparing main components of ESQ: Gap score of PQ is more than SQ and CQ which hints that PQ needs more attention.

Table 8.3. Perceived ESQ score

<i>Dimensions</i>	<i>Perceived Score</i>	<i>Mean</i>
Tangibility	3.42	
Reliability	3.03	
Assurance	3.43	
Responsiveness	2.78	
Empathy	2.74	
<i>Service Quality Score</i>	3.08	
<i>Power quality</i>	2.82	
<i>Cost quality</i>	3.32	
ESQ mean	3.07	

Table No.8.2 reveals that ESQ mean is just above 3.07 which means that consumers were just satisfied in the domestic power services provided by the KSEB. The Shaded cells of the table indicates satisfied dimensions of ESQ and others not. Tangibility, Assurance and Cost quality dimensions perceived by the consumers nearing to the consumers delight.

Figure 8.2. Radar Chart- Perceived ESQ



In all the ESQ dimensions it can be seen that Perceived mean scores (range 2.74 to 3.43) are less than Expected mean score (5). Since the PESQ less than EESQ it is inferred that overall satisfaction on KSEB is only moderate. However, in Tangibility, Reliability, Assurance and Cost Quality dimensions KSEB ensuring a better satisfaction to the domestic consumers.

From Tables 1 and 2 it is found that with regard to the “tangibility” service quality dimension, the average service gap score (-1.58) is lower than the average ESQ score (-1.92). So, it can be inferred that most of the consumers have an opinion that tangibility dimension of service of Kerala State Electricity Board is effective. With regard to “Reliability” dimension, the average service gap score (-1.97) is a jot higher than the average ESQ score. It hints that the Kerala State Electricity Board is able to perform their work in certain promised time and the employees are committed and sincere while dealing with the consumers. Employees also offers and executes error free transactions up to a high extent. But the consumers pointed out that while they facing a problem in connection with supply of power, employees are not paying attention first time to resolve the problem. Consumers were forced to lodge many requests for resolving the problem. Hence, it is a deficiency and it lower the rating quality of service, thus turn in to dissatisfaction. In connection with “Assurance” dimension, the average service gap score (-1.57) is less than the average ESQ score (-1.92). So, it is noticed that most of the consumers of KSEB saying that assurance dimension is fairly effective. Further, it is observed that the behavior of the KSEB employees infuse the confidence among the consumers and opined that knowledge level and skills of employees are high, resulting in a favorable perception of the consumers. It also stated that employees’ courteousness and assurance safety and security to the consumers are much effective.

With regard to “responsiveness” dimension, the average service gap score (-2.22) is much higher than the average ESQ score (-1.92). So, it is evident that most of the consumers of KSEB concomitantly states that responsiveness dimension has to be improved a lot. Besides, it is visible that the KSEB employees are not quickly attempt to the complaints and queries of consumers, which is not a gesture good service approach. KSEB employees are not lagging in communicate to the customer the exact time of processing the transaction, and their preparedness to help the consumers are not impressive, thus resulting in not delivering a quick service to the consumers. In the case of “Empathy” dimension, the average Service gap score (-2.26) is much more than the average ESQ score which reveals that the empathy dimension is not up to the mark. It is an indication that KSEB employees are lacking in serving and assisting the consumers’ specific needs and the employees has to pay more care and attention to deliver sincere service to the consumers.

While integrating PQ and CQ to SQ no changes has been found in the ESQ score. It should be remarked that average PQ gap score (-2.18) is more than average SQ score as well as ESQ mean score (1.92) which reveals that in PQ dimension, consumers don’t have a favorable opinion i.e., consumers are not satisfied in the power stability and re-instatement of power supply. With regard to Cost Quality, gap score (-1.68) is less than ESQ and SQ mean score indicates that in this dimension KSEB’s service is effective up to an extent. However, it is evident in the table -1 that consumers don’t considered as cost of power is affordable.

Difference in Level of overall Satisfaction

H₀2: *The overall service satisfaction level is homogeneous in urban and rural domestic consumers of KSEB.*

Table 8.4: Overall satisfaction of consumer of KSEB

	Extremely	Moderately	Not Satisfied	<i>Row Totals</i>
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	satisfied	Satisfied		
Urban Domestic Consumers	14 (10.50) [1.17]	29 (25.50) [0.48]	7 (14.00) [3.50]	50
Rural Domestic Consumer	7 (10.50) [1.17]	22 (25.50) [0.48]	21 (14.00) [3.50]	50
Column Totals	21	51	28	100 (Grand Total)

The chi-square statistic is 10.2941. The p-value is .005816. The result is significant at $p < .05$. Hence null hypothesis is rejected. The Overall service satisfaction level is not homogeneous in Urban and Rural Domestic consumers of KSEB.

9. Conclusion

Consumer satisfaction is directly related with 'affordable excellence' which can be achieved through quality service, quality product and affordable price. The primary mission of KSEB is to provide quality power at affordable cost as demanded by the consumers of the Kerala and to act as radical stimulant for the development of the state. The present study assessed the gaps between consumer expectation and perception on various dimensions of service quality, power quality and cost quality. Among service quality dimensions, in tangibility, reliability and assurance, domestic consumer gets satisfaction but in responsiveness and empathy, consumers are dissatisfied. In power quality dimensions, domestic consumers have less degree of satisfaction while Cost quality giving a higher degree of satisfaction. However, most of the consumers don't have an opinion that cost of power is affordable. Mean Score of consumer perception indicates that they are moderately satisfied in the domestic power supply services of KSEB. Like that overall satisfaction level is different in urban and rural consumers of KSEB. Voltage instability and unaffordable cost are the dissatisfying factors of rural domestic consumers. KSEB can ensure 'affordable excellence' in power sector of India if the aforesaid dissatisfying factors are minimised. For this, the Extensive Service Quality (ESQ) model is of great use.

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