



The Causes behind the Load shedding and to Find out possible solution in solving the Problem Study of Karachi Region

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ABSTRACT: In this paper, problem of electric load shedding has been find out and its solution. The data was collected from the entire Karachi, because target population is considered Karachi as our research location. The sample size selected is 50, from the KESC. The results show that energy crisis is no way getting better in Karachi. Although Karachi is the biggest industrial city of Pakistan facing problems due to load shedding; there are hundreds of problem in this city related to load shedding, like Industrial Production, unemployment and water supply etc. Hot weather is also being the reason behind load shedding that affects the residents of the Orangi, Landhi Town, Gulistan-e-Johar, Gulshan-e-Iqbal, deffence, p.e.ch.s, karsaz, Liquatabad and Nazimabad, They are compelled to remain awake all night because of persisting power failures or sometimes had to rush to parks and roads outside their homes.

KEYWORDS: Load shedding, Karachi, electric city.

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I. INTRODUCTION

When the supplying company receives more demand for electrical power than its generating or transmission or installed capacity can deliver, the company has to resort to rationing of the available electricity to its customers. This act is called load shedding. This question may be referring to the kind of load shedding which often occurs in places where the total electrical power load which can be taken by consumers greatly exceeds the available amount of energy which can be generated by the local power station or national network of power stations. This is a situation which is common in many developing countries. As soon as total power demanded exceeds a certain percentage - usually 98% - of the maximum possible power that can be generated, parts of the distribution network have to be disconnected. Such disconnections are known as "load shedding". If load shedding was not done the generating equipment's overload breakers would automatically shut down the whole power station to protect its alternators (electrical generators) from very severe damage. Such damage would be extremely expensive to repair and would take a lot of time to do. So in practice, to keep the power stations running 24/7 under such conditions, load shedding is applied to different parts of the distribution network at various set times throughout a regular "power availability" period of, usually, a week. For example, parts of the network supplying homes and small business offices may only get power for two or three hours at a time every day or every other day, whilst important places - such as hospitals, major factories and, typically government offices - may get power almost 24/7.

II Load shedding in Pakistan

Electricity is in short supply in Pakistan, and as a result electric load shedding, break downs, power outages, fluctuations, blackouts etc are a common feature in the country. Whether it is summer or winter, load shedding is there. Sometimes it is scheduled, while on other occasions it is totally unscheduled. The latter is the

worst because it causes untold problems and hardships to the electricity dependent community. It can be confidently said that the electric supply has never been reliable at any time in Pakistan.

There are many factors behind electric load shedding in Pakistan. These factors include shortage in river waters, over population, new connections, electric supply to villages, low generation of electricity, fewer dams, power theft, line losses etc. Then load shedding is the result of corruption, inefficiency, mismanagement and defective planning in WAPDA besides incomplete projects like Kala Bagh Dam, misuse of available resources, no generation from atomic and solar energy, lack of consensus and the apathy of the government contribute to load shedding.

Load shedding is a great curse. It brings untold misery to people belonging to all walks of life whether they are students, patients, businessman, industrialists, farmers, laborers, mechanics, house wives etc. It brings all economic, Agricultural and industrial progress to a standstill. The fluctuation plays havoc with the electric equipments like refrigerators, VCRs, Televisions, and Computers etc. The foreign investors shun investing money in different fields due to load shedding starts a long episode of helplessness and frustration.

Pakistan cannot make progress in any field in the presence of load shedding. Therefore government should take all possible measures to end load shedding from the country. First of all it should remove corruption, inefficiency and mismanagement from WAPDA. New mega dams should be constructed without further delay. The present available resources should be developed immediately. Power should be generated from solar and nuclear energy. Power theft should be stopped forthwith. On the other hand people should make wise and proper use of electricity. They should turn to using energy saving device. No doubt such steps can help a great deal in ending load shedding from the country.

I.II Load shedding in Karachi and elsewhere

One of key difference between a developing country and a developed (civilized) country is the power management. Electricity has become a basic need, and its unhindered, continuous and smooth supply is the necessity, but in countries like Pakistan, it's still a luxury and more or less an elusive dream.

Whether it is the mega city like Karachi or a remote small city like Kohat, the aggravated story of dismal power supply remains the same. Throughout the country, in all the four provinces, in every major or minor city, in every town or village, there nothing exist like solid and robust power supply.

The so-called load-shedding remains the integral part of rural and urban life. It doesn't even go away in winter, but in the summer, it becomes the thorn in the eye. The abuse and curses WAPDA gets in summer, if written on paper and loaded on Titanic, Titanic wouldn't require a storm to get drowned.

Hide and seek role played by electricity only irate the consumers more. It not only snatches the mental and physical peace, but also results in massive financial losses in regard of electronic appliances. Frequent power breakdowns have turned lives of people miserable.

Whenever the protests are raised, government's obstinate clowns shrug and with an intelligent and scornful frown blame the scarce water storage units. **Whose fault it is? Who has to resolve these issues?** Of course, it's the government duty. That is why they are the government. It's their responsibility provide the people with basic utilities like power supply and others. If there are problems, they are the ones to resolve them, if they can't do it, they have no right to remain in power. And people, why in the hell we always elect these people with vested interest who always deceive us?

Hide and seek of electricity is making the life pathetic. It not only snatches the mental and physical peace, but also results in massive financial losses in regard of electronic appliances. Frequent power breakdowns have turned lives of people miserable.

II. OBJECTIVES

Our research objective is:

- To find out the reasons behind this serious and critical issue.
- To explore the effects of load shedding on different sectors.
- To find out is it being the reason behind increasing crime rate nowadays.
- To calculate to what extend it has affected daily life, manufacturing sector, transportation and communication.
- And finally to suggest some recommendations to overcome this problem.

III. METHODOLOGY

Targeted Population:

My targeted population is entire Karachi, because target population is considered Karachi as our research location.

Sampling Techniques and Methods:

I have used different techniques for conducting our survey:

- Judgment
- Quota
- Convenience

Sample size:

The sample size selected is 50.

Location:

Location of research is Karachi; in Karachi I have covered all four zones: east west north and south.

Confidence Interval:

I used judgment sampling because I targeted some individuals by myself.

Research Design

Sources of Data:

The sources of data I have used are:

- **Primary sources**
 - ✓ Survey
 - Questionnaire
 - Interview
 - Mail survey
 - ✓ Observation
- **Secondary Sources**
 - ✓ Newspaper
 - ✓ Statistical reports
 - ✓ Guidelines from different professionals
- **Sampling Designs:**

Sampling to conduct the research on formal basis. It is based on tight structure, precise methods and technique
- **Methods of Data Collection:**

We used both the methods at a time.
- **Survey:**

In survey we have used different tools like Questionnaire, Interview and Mail
- **Observation:**

In observation I have observed different situations where people are suffering because of load shedding.

Control of Variable:

My control of variable is Ex-Post facto, because I have to conduct research in a Natural Environment.

Purpose of study:

My purpose of study is Causal, because we finding the causes and effects of load shedding.

Time Dimension:

My time dimension is Cross Sectional, because I have collected data only once, in a specific period of time.

Topical Scope:

My topical scope is Case Study, because I'm considering only Karachi (micro level), it is specific and few variables are used.

IV. RESEARCH INSTRUMENT

My research environment is Field Environment, because it is a natural condition.

➤ Data Collection

IV.I Tools:

- Questionnaire
- Interview
- Mail survey
- Observation

IV.II Number of researchers involved:

I have conducted the research with the help of different people who gave me information and helped me to complete this report.

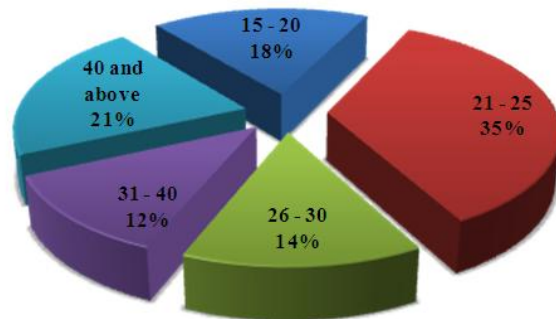
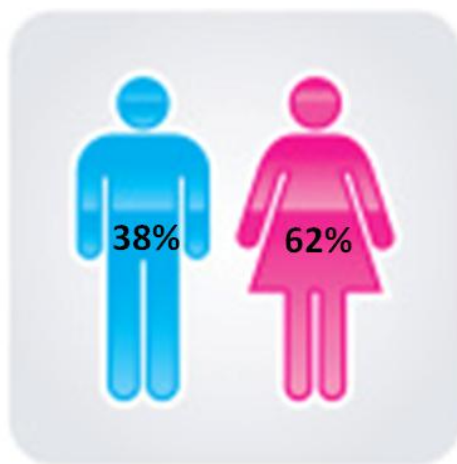
IV.III How I managed irregularities:

- People hesitated to respond me when I approached them because they thought their information will be leaked out but I assured them that their answers would not be revealed to anyone.
- Officials facilitated me after filling their pockets.
- I convinced our parents for providing me with the extra money to proceed my research process further.
- To communicate with the Tailor (interviewee) and other illiterate people I had to use their style of talking.
- To overcome the weather problem I had to take mineral water and beverages along with me.

IV.IV how long it took:

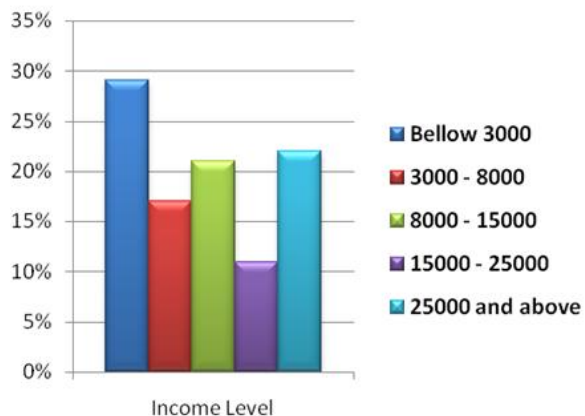
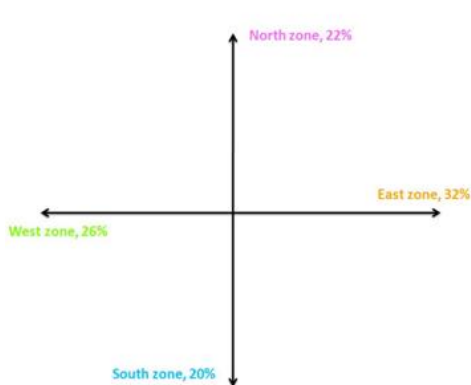
- My research took a whole month to get completed.

Gender: Age group:



Income level

Karachi North	Karachi South	Karachi East	Karachi West
North Nazimabad, buffer zone, north karachi, FB Area, Maymar, Orangi and nearby areas.	Saddar, Cantt, Clifton, garden, Defence, zamzama, korangi and nearby areas.	PECHS, Bahadurabad, Karsaz, KDA scheme 1, Gulshan-e-Iqbal, Gulistan-e-Johar, Korangi, Shahrah-e-Faisal, malircantt and nearby areas.	Chundrigar, SITE, Kharadar, Lyari, Kemari and nearby areas.



Data Analysis

Graphs:

Occupation:



Figure 1 Shows the Occupation of the respondents

Monthly electricity bill:

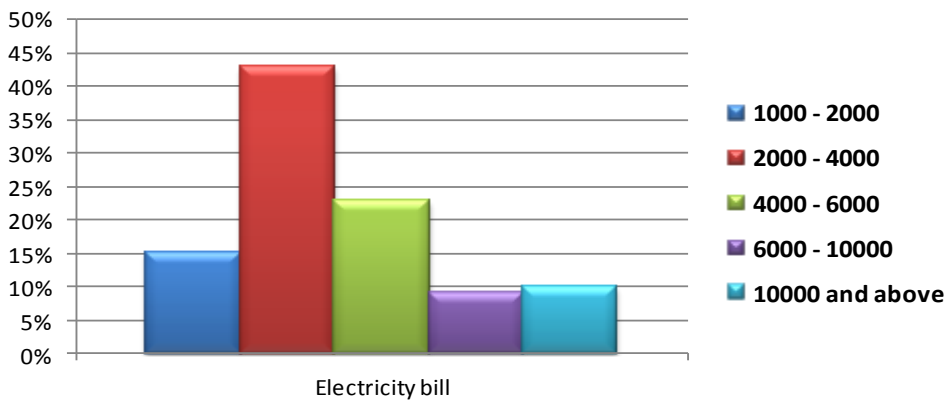


Figure 2 shows the monthly income of the respondents

Duration of Power Breakdown:

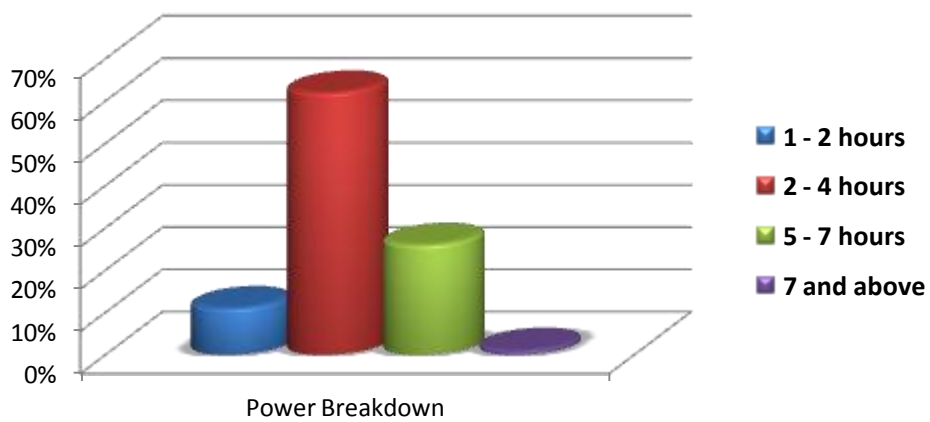


Figure 3 shows the power breakdown

Bearable Duration for Load shedding:

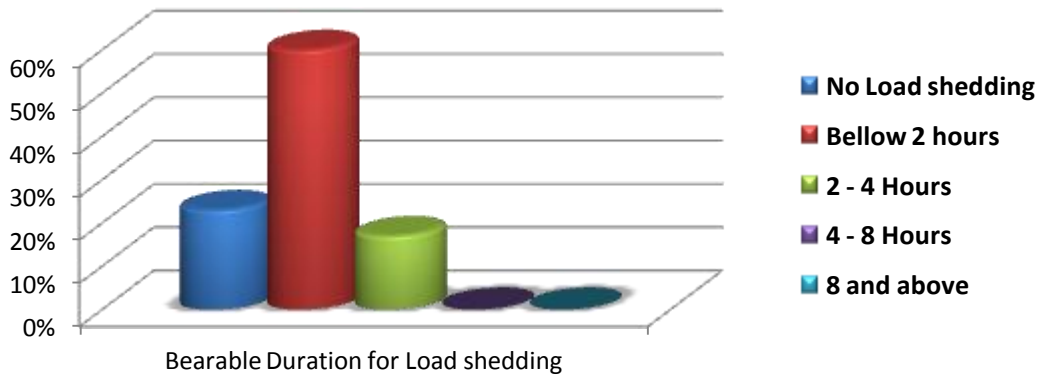
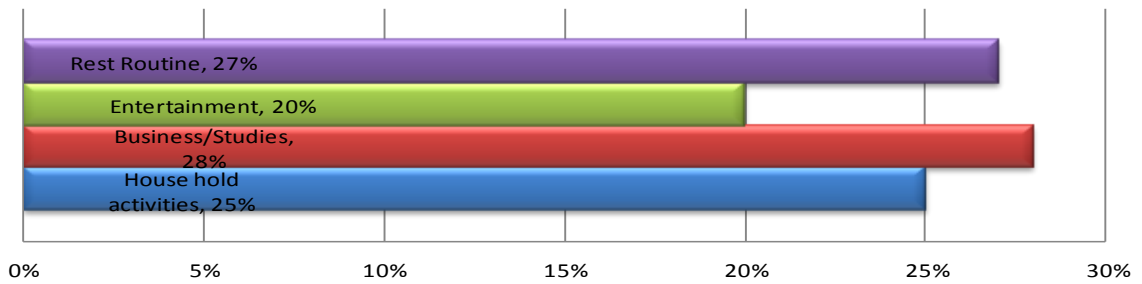
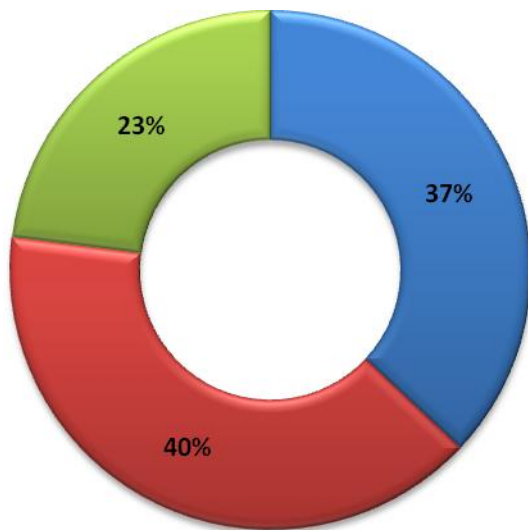


Figure 4 Bearable Duration of Load shedding

Effects of Load shedding on:



Usage of

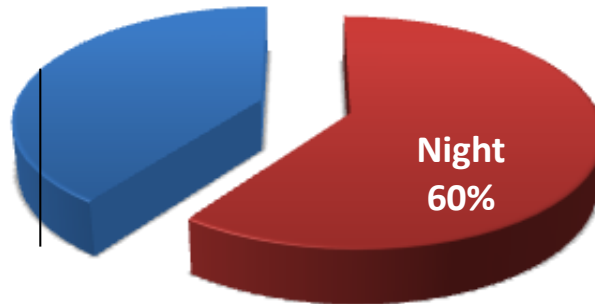


Invertors

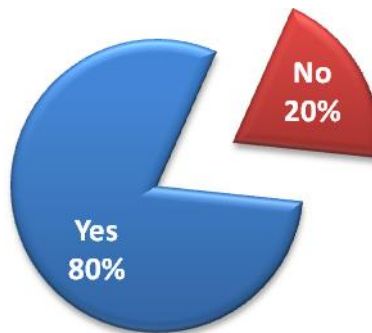
- Generators
- UPS
- Emergency lights

Invertors:

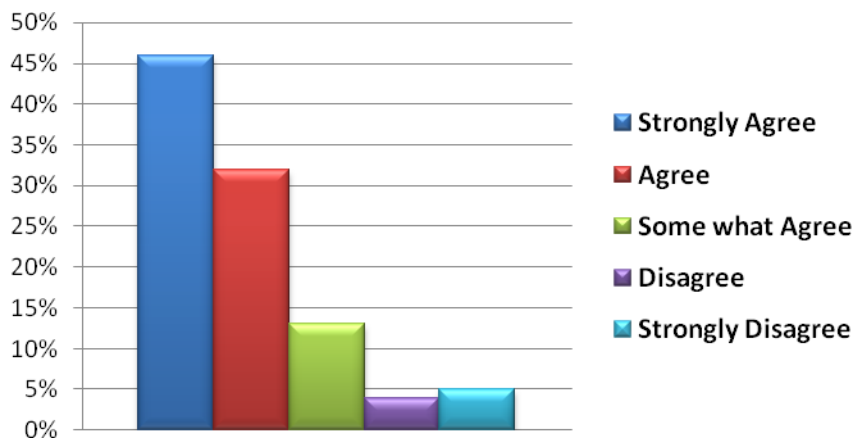
Comparison of Effects of Load shedding According to Timings:



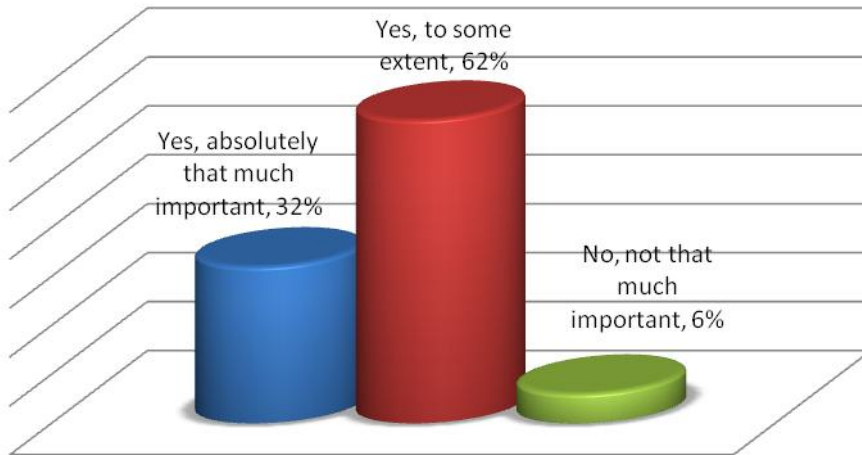
Load shedding is responsible for increasing the crime rate of Pakistan:



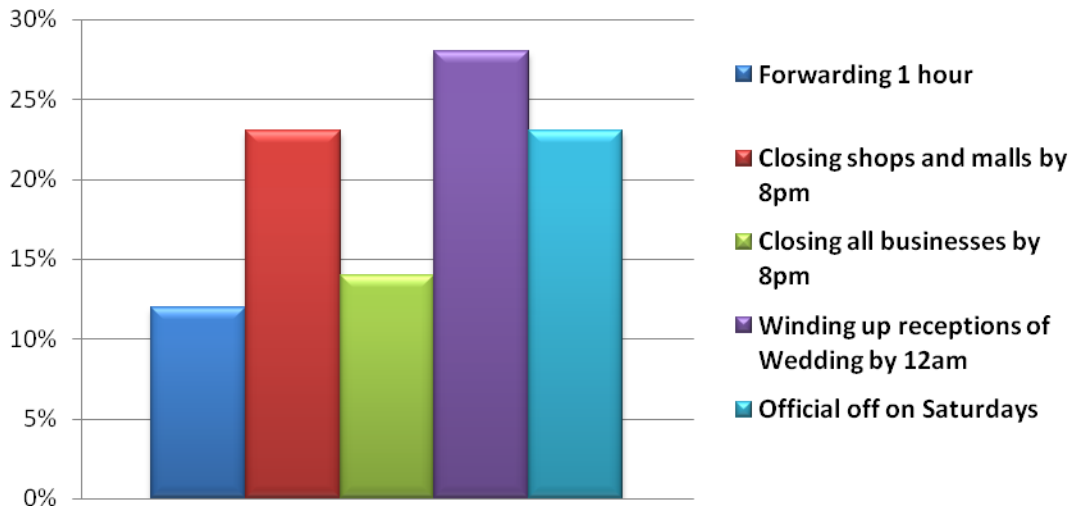
Load shedding: biggest problem faced by Pakistan



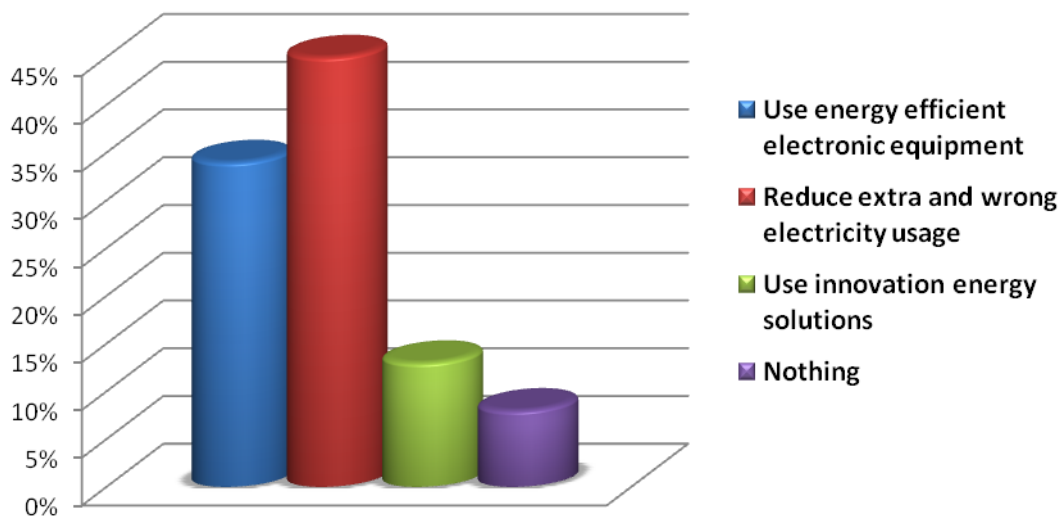
Load shedding a problem as important as poverty, terrorism and illiteracy



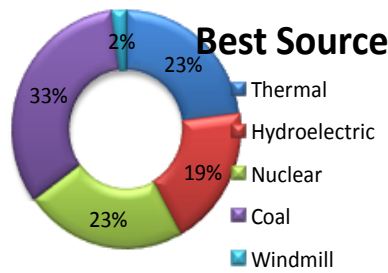
Effectiveness of the steps taken by government



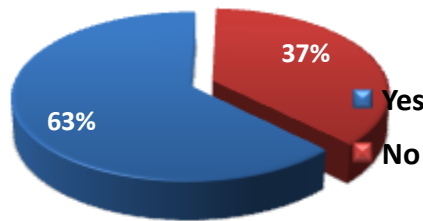
Peoples' Personal Approach to overcome this problem



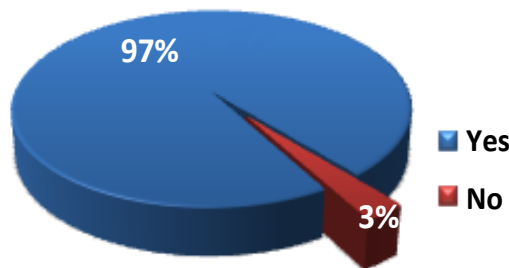
Best source of overcoming power electricity shortage



Rental power plants will solve the current load shedding



Kala Bagh Dam



Testing of Hypothesis

a) 70% of the People consider Load shedding to be the reason for increase in crime rate in Pakistan.

- $H_0 : P = 0.7$
- $H_A : P \neq 0.7$
- **Level of significance:**

$$\alpha = 0.5\% \Rightarrow 0.005$$

$$\alpha/2 = 0.0025$$

- **Critical Value($Z_{\text{tabulated}}$):**

$$\pm z_{0.0025} = \pm 2.81$$

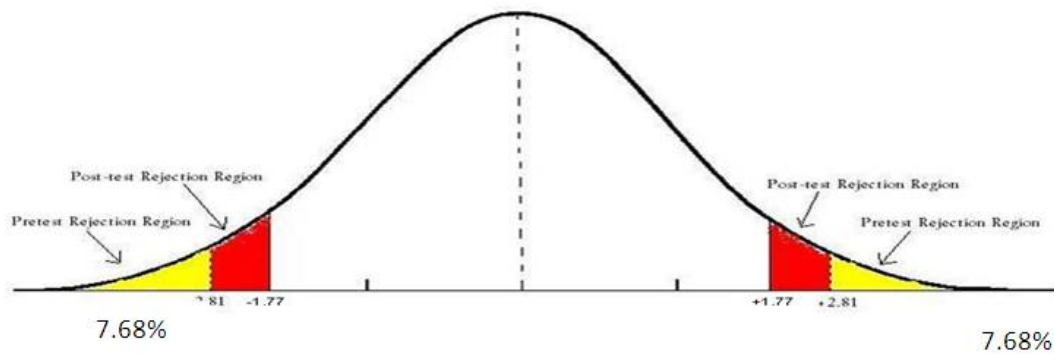
• **Test Statistics:**

- This calculated value of z-score is located in z-score table at 0.0384
- This is Non directional = $\alpha \times 2 = 0.0768$
- $0.0768 \times 100 = 7.68\%$

$$Z_{cal} = 1.77$$

$$Z_{Calculated} = \frac{0.8 - 0.7}{\sqrt{\frac{0.8 \times 0.2}{50}}}$$

• **Post-test Normal Curve:**



I claimed that 70% of the People consider Load shedding to be the reason for increase in crime rate in Pakistan, this became my null hypothesis. I took level of significance 0.5% with critical value ± 2.81 to test it. I performed a two tail test and concluded that I should accept the null hypothesis as the actual rejection region is less than proposed rejection region. The calculated value lies in the acceptance region at 1.77. But if I recall the Type 1 Error then I should reject it, because due to this our rejection region is increasing. I would accept it at (P-Value) 7.68% level of significance.

b) 80% of the People think that government can NOT solve this problem.

- $H_0 : P = 0.8$
- $H_A : P \neq 0.8$
- **Level of significance:**

$$\alpha = 5\% \Rightarrow 0.05$$

$$\alpha/2 = 0.025$$

- **Critical Value ($Z_{tabulated}$):**

$$\pm z_{0.025} = \pm 1.96$$

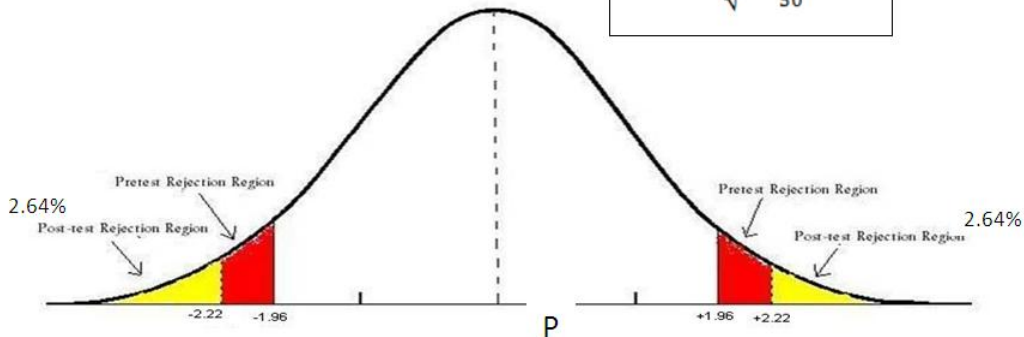
• **Test Statistics:**

- This calculated value of z-score is located in z-score table at 0.0132
- This is Non directional = $\alpha \times 2 = 0.0264$
- $0.0264 \times 100 = 2.64\%$

$Z_{cal} = -2.22$

$$Z_{Calculated} = \frac{0.65 - 0.8}{\sqrt{\frac{0.65 \times 0.35}{50}}}$$

• **Post-test Normal Curve:**



I claimed that 80% of the People think that government can NOT solve this problem, this became my null hypothesis. I took level of significance 5% with critical value ± 1.96 to test it. And performed a two tail test and I concluded that I should reject the null hypothesis as the actual rejection region is greater than proposed rejection region. The calculated value lies in the Proposed Rejection region at -2.22 . But if recall the Type 2 Error then I should accept it, because due to this my rejection region is decreasing. I would accept it at (P-Value) 2.64% level of significance.

c) 90% of the People are in favor of KALA BAGH DAM.

- $H_0 : P = 0.9$
- $H_A : P \neq 0.9$

• **Level of significance:**

$\alpha = 5\% \Rightarrow 0.05$
 $\alpha/2 = 0.025$

• **Critical Value ($Z_{tabulated}$):**

$\pm z_{0.0025} = \pm 1.96$

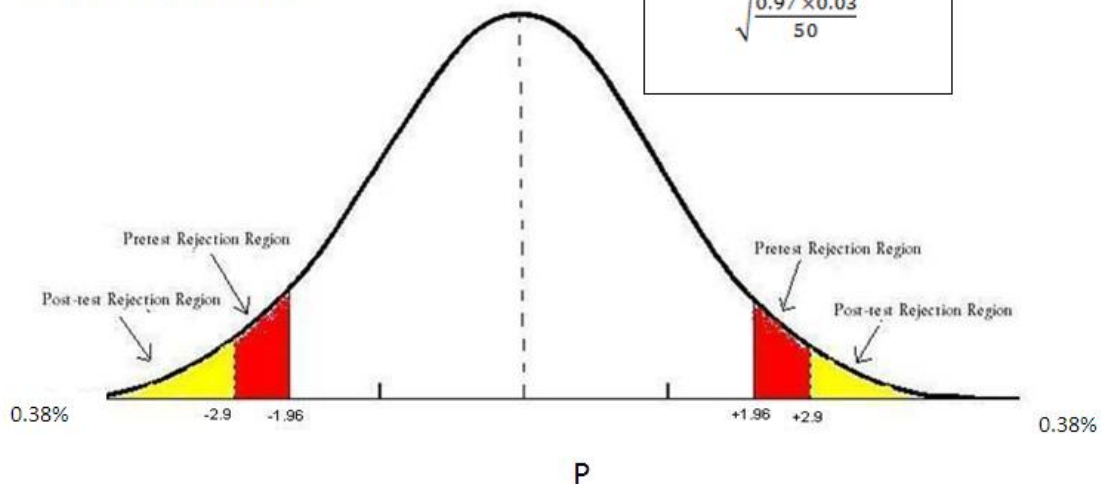
• **Test Statistics:**

- This calculated value of z-score is located in z-score table at 0.0019
- This is Non directional = $\alpha \times 2 = 0.0038$
- $0.0038 \times 100 = 0.38\%$

$Z_{cal} = 2.9$

$$Z\text{-Calculated} = \frac{0.97 - 0.9}{\sqrt{\frac{0.97 \times 0.03}{50}}}$$

• **Post-test Normal Curve:**



It was claimed that 90% of the People are in favor of KALA BAGH DAM, this became my null hypothesis. I took level of significance 5% with critical value ± 1.96 to test it. I performed a two tail test and concluded that I should reject the null hypothesis as the actual rejection region is greater than proposed rejection region. The calculated value lies in the Proposed Rejection region at 2.9. But if I recall the Type 2 Error then I should accept it, because due to this our rejection region is decreasing. I would accept it at (P-Value) 0.38% level of significance.

V. OBSERVATIONS

In this situation I observed that students are deady affected by Power failure. As students are the future of Pakistan but unfortunately our future is at stake because students are suffering this power failure during exams and they get disturbed, they are unable to study properly during night and even at day times, as the weather has become very harsh and temperature is increased because of global warming. They are unable to sleep properly and this affects their health as well.

It is observed that the markets are also affected badly due to power breakdowns. Some shopkeepers run generators because of load shedding which makes market a miserable place during power cut, as generators create the irritating noise and people avoid visiting market during day time because of this, they like to visit markets more at night time but government has band that which affects the businesses of the shopkeepers badly.

As we can see in this picture that people are protesting against government as they did not take any proper decision for the reduction of load shedding. This protests shows that people are now frustrated, and want this problem to be solved

While taking this picture I observed that Load shedding is not only affecting the students but the teachers as well. They are not able to teach students properly and students are unable to concentrate during lecture.

This is the newspaper's head line that I took as my observation. About this picture is observed that it is a two sided picture; one side of this picture is that poor people can't afford invertors for their homes. That's why they are compelled to sleep at roads or streets and our government is sleeping in their homes with Air Conditioners. The other side of this picture is that even media is focusing on these areas but government is paying deaf ears to them.

VI. LIMITATIONS

Respondents were not ready to respond for interviews. The attitude of the officials was very rude with us. They did not respond at first then I visited them again and they made me wait for long but they facilitated us after getting bribed. During my research I have observe a protest was happening in a market by the shopkeepers after getting frustrated because of power failure. My researchers stuck in that protest and got injured by the "Lathi Charge" done by Police to control the situation. I faced a budget shortage in our research process. As I'm student and I do allocate my budget according to my pocket money, but I face shortage because I'm forced to visit the officials twice or thrice and that increased my transport expense. When I approached Tailor for the interview, and face language barrier because he was unable to understand my questions. Due to this hot weather, I faced difficulties while conducting interviews and doing observations.

VII. FINDINGS

I did conduct a research on Load Shedding and I took a sample size of 50 in which 38% were male and 62% were female, I got more respondents from the age group of 21-25. And got the highest response from the people who have income level below 10,000. I have covered all four zones of Karachi; North Zone, South Zone, East Zone and West Zone.

Occupation:

21% Of The Respondents Were From Job Side.

Monthly Electricity Bill:

43% People Suffer Electricity Bill Ranges From 2000 To 4000.

Power Break Down:

62% People Suffer From 2-4 Hours Of Power Breakdown Daily In Their Locality.

Bearable Duration for Load Shedding:

60% Were In A Favor Of Below 2hours.

Effects of Load shedding on:

28% Said That Business Activities And Studies Are Highly Effective.

Usage of Invertors:

40% Prefer UPS.

Comparison of Effects Of Load Shedding According To Timings:

60% Said That Load Shedding At Night Affects Them The Most.

Load Shedding Is Responsible For Increasing The Crime Rate Of Pakistan:

80% Said Yes, It Is Responsible.

Load Shedding: Biggest Problem Faced By Pakistan:

46% Strongly Agree That It Is The Biggest Problem.

Load Shedding a Problem As Important As Poverty, Terrorism and Illiteracy:

62% Said Yes, It Is A Problem As Important As Poverty, Terrorism And Illiteracy To Some Extent.

Effectiveness of the Steps Taken By Government:

28% Are In A Favor Of Winding Up Receptions Of Wedding By 12am.

Peoples' Personal Approach to Overcome This Problem:

42% People's Personal Approach to Overcome This Problem Is to Reduce Extra and Wrong Electricity Usage.

Best Source of Overcoming Power Electricity Shortage:

33% Favored Coal as the Best Source.

Rental Power Plants Will Solve The Current Load Shedding Problem:

63% Said Yes.

Those who said No mentioned the reasons:

It requires oil and we don't have much oil.

Flawed trick of government to make money.

It needs oil and gas and we don't have enough oil and gas.

It's very expensive

Shortfall is too great to be overcome by RPP.

It is one of the biggest problems of Pakistan which rental power plant can't solve. It may solve the problem for a short period of time but not for longer period.

It's not an efficient way of solving such a big problem.

We should have the permanent solution.

People can afford it.

Can The Present Government Resolve The Issue?

65% Answered No.

Kala Bagh Dam:

97% Answered Yes, reasons being:

Country needs many dams. We must start with Kalabagh and all other pipeline dams as AP.

Dams would be very effective.

It would help a lot.

Because it will help to grow the electricity of Pakistan.

It will reduce the electricity problem.

It will help the country to reduce the shortage of electricity

We need more and more dams to generate enough electricity.

It is in the larger interest of the country.

It is good for agriculture and electricity.

Dams are the back bone of any country.

We can solve water problem and also can generate cheap electricity.

It helps to generate electricity.

It is in the general interest of Pakistan.

It increases water level and help in making hydro electricity.

It can solve the energy crises.

Water supply of Sindh would be affected.

VIII. CONCLUSION

After conducting this research it is conclude that the energy crisis is no way getting better in Karachi. Although Karachi is the biggest industrial city of Pakistan facing problems due to load shedding; there are hundreds of problem in this city related to load shedding, like Industrial Production, unemployment and water supply etc. Hot weather is also being the reason behind load shedding that affects the residents of the Orangi, Landhi Town, Gulistan-e-Johar, Gulshan-e-Iqbal, deffence, p.e.ch.s, karsaz, Liquatabad and Nazimabad, They are compelled to remain awake all night because of persisting power failures or sometimes had to rush to parks and roads outside their homes.

Karachi Electric Supply Corporation (KESC) has paid deaf ear to the suffering of the people. People keep on protesting but the duration of load shedding has increased insteadup to 10 hours mostly unannounced. Students and business class are suffering the most.

Government knows the problem but is unable to provide any relief to Karachities. Despite promises made at the time of election, Pakistan People's Party (PPP) and Mutahida Qaumi Movement (MQM) are busy in accusing the management of KESC for the present crisis than doing something substantive. Government of Pakistan said continuously they follow IMF order and their finance minister instruction to increase monthly unit rate. In august 2008 per unit rate is 3.71 now in April 2010 per unit price is 7. There are some reasons behind load shedding described below:

1- Electricity Generation Resources:

We don't use latest technologies for generating electricity like Wind, coal, Gas and Nuclear Power. We just concentrate on the process of hydroelectricity. A very few MW we generate by other technologies.

2-Water issue:

Load-shedding is being carried out in the country because of insufficient level of water resources. The water resources are at 36 percent, which is the lowest in history. We need to build "kalabaghdam" because T-communication investment=\$12billion, Ups + battery import=\$10billion, But We required only \$7billion on KALA BAGH DAM project. We can generate 7500MW electricity and unit will be 0.60 paisa's only. But unfortunately our few illiterate people and leaders don't realize the importance of this dam on the other hand mostly people are in a favor of this dam but unfortunately nobody is there to raise their voices that's why we are continuously lacking behind and going to Dark Age back!

3-The People of Pakistan:

In most cases it's not only the government that is responsible for the downfall of the electricity or economy in this country including the social and political downfall. It is the people who also contribute to the problems. It is our deeds that we facing, How many of us saving electricity? How many of us don't steal electricity?

Recommendations

After conducting this exhaustive research, I am now concluding with some suggestions with a hope that they would be very effective if followed.

Suggestions for Government:

i. Let the Kala Bagh Dam be built:

After conducting a proper research I got to know that 97% people want this dam to be built. And we Pakistanis have 2nd largest Dam, 3 nuclear reactors and 5 rivers. There would be no load shedding in fact we would have excess of electricity if these resources are utilized properly.

ii. Go with the offers provided by Iran and china:

IRAN offered urgent electricity to Pakistan at rs.1.18 per unit & china offers us just at rs.300 per month bill with unlimited use but Govt. Is kicking these opportunities & making heavy & expensive agreements with IMF for rental powers from America.

iii. Don't let IMF destroy our economy:

IMF is doing nothing just misusing its aid to destroy the economy of Pakistan. We Pakistanis have 2nd largest salt mine, 5th largest gold mine, 5th largest coal reserve, 7th largest copper mine, Still begging from IMF! In Pakistan electricity is rs7 pr unit it will be increasing after 2months according to IMF agreement.

iv. Suspend Raja Pervaiz Ashraf:

By suspending Raja Pervaiz Ashraf Minister of Water & Electric Supply government can save Pakistan and peoples of Pakistan, because 200% commission is earned monthly with Electricity by Minister Raja Pervaiz Ashraf.

v. Replace the overall staff of KESC with youth:

Suspend all Line Man / Meter reader / KESC employee who involved in illegal connection, all line man/meter reader are involved in illegal connection, no one has asked them till date. Bring youth to these sectors.

Suggestions for KESC:

vi. Try some new and modern techniques for producing electricity:

Many techniques are there except the one KESC is currently using, like Coal, Thermal, nuclear, solar, windmill. In fact during my research I got to know that 33% people suggested coal energy to be used for generating more

and cheap electricity. Solar power is even cheaper than coal, it just needs heavy investment but that is just once, after that it would produce cheapest electricity because its maintenance is really cheap.

vii. Entire Wiring system is needed to be repaired:

Proper wiring system from PMT to Electric pool in every street/area, because during the research I got to know that there are a lot of areas where more than 10 years old wiring system is being used, and because of the use of air conditioners load increases and those wirings are not efficient enough to bear that much load.

viii. Improve the infrastructure of KESC itself:

When I went to the KESC office and found it to be in a very pathetic condition (as shown in my observation). KESC needs to improve its infrastructure first.

ix. Collect all the outstanding bills:

Collect electricity bill from all political parties as well, who use free electricity in their offices. KESC can save 700 MW per month.

x. A proper watch on Kunda system:

Remove all kunda system / illegal connection from every electric pole. As shown in one of my observations that many large companies are having kunda installed this is the theft of electricity and should be stopped.

Suggestions for Public

- Save electricity by avoiding extra use of power
- Stop stealing electricity.
- Inform KESC about the kundas being used at different places.
- Reduce the usage of electricity during prime time (8pm to 11pm).

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