THE IMPACT OF ELECTRICITY POWER CUTS IN MKOBA HIGH DENSITY SUBURBS OF GWERU CITY, ZIMBABWE

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ABSTRACT

The study sought to explore the impact of electricity power outages on the residential consumers of Mkoba high density suburbs in Gweru city, Zimbabwe. Fundamentally, the examination of this topic has been stimulated by criticism of erratic and unreliable power supply to residential consumers in spite of the several advance payments made by consumers to the power utility company. The qualitative research approach was used to solicit various ideas, opinions, perceptions and attitudes on the impact of power outages to consumers despite the recently introduced electricity prepaid meters hoping for an improved power supply. Data were collected through face to face interviews, focus groups and open ended questionnaires. Purposive sampling was employed to collect data for this study. Data were thematically analysed in line with the qualitative research approaches. It emerged from the empirical findings of the study that residential consumers are heavily affected by incessant load shedding. The unreliable and unplanned cuts have damaged refrigerators, radios, television sets, electric stoves and many other electrical appliances. Consumers are incurring huge costs against the depreciation of their living standards. This study recommends that the power utility ZESA must encourage consumers to switch to the use of solar, gas and other accessible forms of power. Also ZESA through government needs to invest heavily in the generation, distribution and maintenance of electricity supply to consumers and other productive sectors of the economy. There is also need for a deliberate policy by government to engage the local and international stakeholders to stimulate direct foreign investment.

Key words: Power outages, load shedding, ZESA, wood fuel and residential consumers.

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Background to the study

Zimbabwe's years of economic and political instability, especially in the last decade of the Zimbabwe crisis, have had catastrophic effects on the national economy, much of which has left many of its once-vibrant sectors and industries significantly depleted (Kamidza 2009: 6). Power shortages have impacted most countries at varying degrees but more prominently in Zimbabwe. The Zimbabwe Electricity Supply Authority (ZESA) has been responsible for the generation, transmission and distribution of electricity in Zimbabwe for a long time now. It has five major power stations, with a total capacity of 1,961 MW (Karekezi, *et al*, 2002). The beginning of political challenges in 1999 in Zimbabwe has impacted negatively on several fronts. In response to the deteriorating economy the government pursued a political agenda which has seen the country's economy plunging into deep crisis. The deterioration of the economy made it impossible for the government of Zimbabwe to afford adequate provision of electricity power both to industry and domestic consumers. Moreover, the country was facing a macroeconomic financial crisis that made it difficult for the governments, both the Central and state governments, to fund power projects through budgetary support **(**Delhi Electricity Regulatory Commission, 2013). For about 50 years the industry operated as a regulated monopoly (Mangwengwende 2005:5; World Bank 2008). Owing to the above events the government decided to restructure the power sector into a number of boards. The power sector was unbundled into four subsidiaries. The Electricity Amendment Bill of 2003 thus recommended the formation of the successor companies under ZESA holdings: Originally it was Zimbabwe Electricity Supply Authority (ZESA) and the restructuring process culminated into, Zimbabwe Electricity Transmission and Distribution Company (ZETDC), Zimbabwe Power Company (ZPC) Enterprise and Powertel Communication and ZENT. The rationale for the restructuring was to increase efficiency and provide the opportunity to correct previous imbalances in management and operations in the electricity sector.

Although the measures meted out included more than one distribution they all fall partly under government. Of these subsidiaries ZETDC is mandated to provide distribution of power to the industries and domestic consumers. In spite of the breakdown of Zimbabwe industries there is critical shortage of the commodity for domestic consumption. The power industry can not provide adequate electricity to domestic consumers not in Gweru high density suburbs only but in the whole nation. Zimbabwe needs about 2200 megawatts of electricity at peak consumption

but generates just below 1300 megawatts, while relying on imports to fill the gap (Staff Reporter 2014). Due to ageing equipment, power generation is often disrupted following breakdowns. In most cases, the Load shedding had a number of negative impacts both on the nation's economy and social life of citizens (Zano 2014). The generators operate below capacity. The Zimbabwean load shedding triggered outages which are a result of the following undermining supply factors (ZPC, 2009): lack of investment by government in the power utility for expanded electricity generation, internal conflicts, drought reducing water supply to the hydro-electric power station, under supply of coal to the thermal power station, vandalism of equipment and transmission wires, incorrect pricing, excessive regulation and skills flight (ZESA, 2009). Interruption or outage is defined as the complete loss of supply voltage or load accent. While a planned outage occurs when electrical lines or equipment have to be temporarily taken out of service for repair or to allow network maintenance and alterations. The domestic sector was the worst affected as it could not negotiate reduction in its outage time (Zimbabwe Chamber of Commerce, 2009). Zimbabwe has five major power stations, with a total capacity of 1240 MW (ZESA 2007). These facilities do not meet electricity demand. Electricity generation in Zimbabwe is mainly from coal and hydro plants, with a capacity of 1240 MW, while the Kariba hydropower plant generates 780 MW (ZESA 2009). So far there are two main sources of power in Zimbabwe, with Kariba hydro power electricity producing a capacity of 780 MW, and Hwange coal thermal power producing 460MW giving a total of 1240. Zimbabwe resorted to buying electricity from the neighbouring countries and they are demanding cash upfront. Since over 70% of ZESA are imports of foreign currency related, proper plant, transmission and distribution equipment maintenance was impossible (ZESA 2006). ZESA's costs of operations have increased considerably, particularly those related to payment for import of power in foreign currency and servicing of foreign debt (ZESA 2006).

Serious electricity load shedding started in 2000 soon after the land reform programme in Zimbabwe (Kayo 2001). The country was starved of foreign currency required to meet importation of fuel and electricity (Ministry of Energy and Power Development 2005). Foreign suppliers demanded advance payment before electricity is supplied. The supply was constrained whereas demand was growing high from growth in urban households, rural and growth point electrification (ZESA, 2007). In 2006, Zimbabwe suffered foreign currency deficits, tight

economic sanctions, hyper-inflation, coal mine squabbles and high brain drain which further worsens power generation problems (ZESA, 2006). In 2007 Zimbabwe was disconnected from South Africa ESCOM. This followed the same trend with other neighbouring countries due to payment problems. ZESA technicians and engineers also blamed the poor quality transformers and related equipment being acquired (ZESA, 2009). The performance of these equipment resulted in high levels of network electricity losses of 17% in 2009. Zimbabwe was importing 40% of its electricity requirements in 2005 (ZESA, 2009), but imports dropped dramatically after that. The generation of electricity in 2009 was at 55% of the potential capacity (ZPC 2009). To meet local demand the rest had to be imported (ZESA, 2009).

The situation became almost impossible and the power utility decided to resort to planned and unplanned load shedding. Load shedding is an organised form of electricity outages (Eto, Divan & Brumsickle 2004). Increased energy consumption is correlated with increased life expectancy, improved health, decreased mortality rates and improved productivity since the 1940s. A World Bank study (1998) found that improved energy supply contributed approximately 0.8 to 1.9 percent of the accelerated annual growth of the Asian Tigers. Electricity facilitates an array of end-use equipment, including those for cooking, cooling, lighting, safe storage of food, clean water and sanitation (Ikeme & Ebohon 2005). Domestic consumers have also been caught in the crossfire and are now forced to adjust to unscheduled power cuts and run for hours on end without supplies from ZESA (News Day, September 29, 2014). All the productive sectors and households are negatively affected by unreliable electricity supply (Mayo 2004; Zimmerman, Lave, Restrepo, Dooskin, Hartwell, Miller, Remington, Simonoff, & Schussler 2005) and Zimbabwe's producers and consumers experience very high levels of electricity unreliability (Mangwengwende 2005:1). In 2008 and 2009, most industries were operating below capacity as a result of power outages and other problems (Confederation of Zimbabwe Industries, 2009) There is no doubt that the current power shortages have raised the ire of consumers who after paying heavily for electricity in prepaid tokens, find themselves digging deeper into their pockets to buy gas, paraffin, firewood and candles to power their homes (News Day, September 2014). Rationally, this study is important as it can be used in a cost benefit analysis for developing or improving the power systems in Zimbabwe. Besides the power outages in Zimbabwe has be come a cause for concern and there is very little research conducted on the impact of power

outages to residential consumers in urban areas. It is so surprising that some places in the country never experience such disturbing load shedding timetables (Madanhire 2014). Therefore the state of affairs must be unravelled.

PROBLEM STATEMENT

Activities ranging from the supply of power to basic survival needs of the populace have been affected in Zimbabwe. This has impinged on the quality of life of almost every citizen. Energy being an imperative for economic development and human survival has ever remained a scarce resource despite advance payments by consumers in anticipation of its supply. The incessant power outages have resulted in appalling high levels of human suffering and degradation, closely tied to this are insufficient power supplies to residential consumers of Mkoba high density suburbs in Gweru city. The main problem is to establish the effects related to supply of electricity for the purpose of taking decisions regarding a fair supply of the commodity against the cost of electricity bills levied for each end user. It is indeed upsetting to see a location very close to your home with electricity almost every day while it's a complete blackout in your area (Madanhire 2014).

Objectives of the study

The study sought to explore some of the following objectives:

- To explore the impact of power outages to Mkoba residential consumers.
- To come up with mitigating interventions to improve supply of energy to residential consumers.

Research questions

- What are the effects of power outages to Mkoba residential consumers?
- What mitigating strategies can be adopted to improve a fair supply of power to consumers?

Purpose of the Study

The purpose of the study was to explore the impact of electricity power cuts to residential consumers of Mkoba high density suburb of Gweru city.

Methodology

The research adopted the qualitative interpretive approach. A case study design was employed in this study. The qualitative approach was preferred because it allows the researcher to gain understanding of this social phenomenon from participants' perspectives in their natural settings, (McMillan and Schumacher, 2010). All the participants of this study were purposely selected and data were analysed thematically in line with qualitative research approaches. Data were collected through face to face interviews, open ended questionnaires and focus groups. The responses of the interviews were captured for further interpretation. Three focus groups of nine participants each were conducted and thirty participants answered the open ended questionnaires. This study had chosen to use various sources of data analysis so that diverse points and views cast light up on a topic. Thus qualitative researchers generally use this technique to ensure that an account is rich, robust, comprehensive and well-developed, (Denzin, 1978). All the data gathered in this study were transcribed and analysed thematically in line with qualitative research approaches. Themes emerged from the data.

Findings and Discussion

The main objective of the study as alluded earlier on was to explore the impact of power outages to Mkoba residential consumers. All the results of the study found were discussed as follows.

Impact related to destruction of house hold appliances.

The economic crisis of the mid 2000 rendered useless the gains of the 80s. Many are reverting to the use of wood fuel because of the sudden increase of the electricity load shedding in the area under study. This study revealed that Mkoba high density suburbs were rocked by incessant power disruptions either during the day or less frequently in the night before 8pm. The abrupt power disruptions have created human suffering due to the damage made on consumer house hold gadgets. Load shedding had a number of negative impacts both on the nation's economy and social life of citizens (Zano 2014). The study revealed that consumers are incurring losses due to power outages. One consumer confirmed this and said, *"I think more that 97% of consumers are being short-changed by ZESA. We suffer a double tragedy where our electrical gadgets are damaged due these unplanned power cuts. Besides we sometimes spend more than*

12 hours without this important service." Zimbabwe's producers and consumers experience very high levels of electricity unreliability (Mangwengwende 2005:1).

The research further revealed that the electricity unreliability comes along with high cost to the consumers. Worse off the consumers do not have the bargaining power to settle for at least scheduled power supplies with reliable time tables. Some consumers had this to say,

> *"The effects of these interruptions are quite costly to us, we as residents have incurred damages of refrigerators and their compressors, radios blowing off, electricity bulbs, electric cooking stoves, television sets and other electrical appliances. These assets could no longer function unless we further incur the costs of repairing them. There are no guarantees that the gadgets could operate continually without being succumbed to the same predicament. Electricity is meant to improve our living standards instead it is diminishing and demeaning our living standards and statuses."*

The comments made by the consumers tend to suggest that power outages are bringing untold suffering due to loss of property and increased cost of living. The burden associated with electric power costs are pruning the consumer's gains and leave them to regret and there is no viable option to power that can beat electricity. (Zano 2014) endorses that domestic consumers have also been caught in the crossfire and are now forced to adjust to unscheduled power cuts and run for hours if not days on end without supplies from the perennially bungling ZESA. The study found out that electricity supply to Mkoba high density suburbs were erratic and it was difficult for consumers to put in place strategies to minimise or avert the intermittent power failures . *"I have two refrigerators whose compressors have been damaged from these power disruptions. What an inconvience today I beg a neighbour to use his fridge to preserve my food. ZESA is making us baggers."* Such complaints were common from the interview participants. It emerged that the power utility does not stick to its time tables and inconveniences have come to be huge costs to consumers.

Impact related to food loss

There are many costs associated with electricity outages and these costs are borne by a wide spectrum of users (World Bank, 2005). The findings of this study established that electricity surges bring up unaffordable costs to the consumers. The major cost cited is the depreciating of food value, loss of food which would have turned bad due to fridges that stay prolonged hours without electricity. The participants to the question on what optional ways they could take to avoid food spoilage showed that there are no mitigating strategies to take to prevent perishable food to go bad. Most of the reports made by participants in the focus group concurred with responses from interview participants. They advanced that,

> *"We do not know what we should do but we are severally exploited by our power utility Supplier. We have reasonably lost large chunks of meat which could not maintain in natural temperatures during loss of electricity. There are many losses which include vegetables, milk, fruits and many other food stuffs. ZESA does not compensate us. One gets the cash wants and buy wants it is hard in Zimbabwe nowadays just to get one US dollar.*

The above comments seem to imply that the residents are suffering at the mess of inadequate supply of energy power. While many have received the metered ZESA model they have lost confidence in the power supplier. The losses incurred are difficulty to quantify and propondence of consumers to eat poisoned food was mentioned more often than not by the participants. *"Some of the diseases which affect us are a result of eating hazardous food which has been affected due to lack power energy."* Outages also have negative health and living condition effects (Terreblanche, Nel and Opperman 1992). The results of this study seem to emphasize a point that electricity is so precious that it is meant to preserve food, improve living standards and enjoying all the utility benefits of the service but given the situation during the time of study the gradient of consumers' quality of life is in sharp decline and the situation is going unchecked. The lack of intervention by the power utility seems to spell the unending problem and hard times that await the nation into the unknown future.

Provision of electricity is being perceived with mixed feelings among the consumers. It was revealed in this study that some villages rarely get power disruptions while others are lamenting in the pitch darkness. It is indeed upsetting to see a location very close to your home with electricity almost every day while it's a complete blackout in your area (Madanhire 2014). This situation seems to suggest that load shedding is not fairly done during the time of this study. The power utility seems to use criteria that are not known to customers on how it manages to supply electricity under circumstances that are not fair or above board. However, the degree of complains have varied during this study between the regular and non regular users of the needed commodity

Electricity option related effects

The electricity users in Mkoba high density suburb perceived power outages as an excessive ploy by the power utility to down grade them and reverse their gains to wood fuel. It emerged that over 95% residents resort to firewood for cooking and candles, torches, even cell lamps for lighting. The residents are forced to fork out cash to buy firewood which is too expensive since wood fuel as gained in price taking advantage to the unreliable power supply. Empirical evidences have shown that electricity goes on and off five times in an hour, and has created the serious problems for consumers to balance off their energy requirements. At times the residents may go for more that 16 hours without the commodity, while people need power for cooking, heating water for bathing, in fact preserving food in fridges. When asked how the consumers account for the impact in power cuts, residents in a focus group assured out the following comments,

> *"We thought our problems have come to an end when ZESA introduced the prepaid meter models. Sadly the bad load shedding problem had actually worsened when every consumer expected an improvement. In fact ZESA makes us to pay in advance hoping for a fair deal, nonetheless we are always on the loosing side. We want clean energy, firewood is expensive and is polluting our suburbs, and you can't like it."*

The study further revealed that firewood is the main form of fuel used in the study area and less than 5% residents have an option to use both firewood and gas for cooking and heating. The price of fire wood tends to go up due to the high demand of the fuel. All respondents in the survey indicated that supply of fired wood was unreliable and this has its own ills. Although the consumers are willing to pay for the service the degree of hardship and discomfort impacts negatively. The police sometimes apprehend those who sold fire wood from the peri-urban settlements. It emerged that the firewood was believed to have been stolen from near by farms and apparently buying of poached wood is illegal and against the law. It become difficulty to buy the firewood in a free atmosphere and those who were licensed to sell wood fuel could not meet the demand of the commodity. The characteristics of poverty are dominating the scene and hovering in the study area. He says, *"Poverty! Poverty! We are living in abject poverty."* The prevalence of poverty compels many households to subsist on the natural resources (like firewood), causing overexploitation of these resources and resulting in social 'bads' like deforestation, and contaminated drinking water sources (Saghir, 2005). Furthermore, at the physical level, cases of environmental degradation are reflected by numerous patches of denuded woodland and decertified landscapes, which are vulnerable to soil erosion during both dry and wet seasons, (Mapira and Munthali, (2013). This research found that there were spill over effects to the erratic supply of electricity. At times people were questioned by the law enforcements agents on where they got the supplies of wood fuel in anticipation to try and thwart the effects of deforestation and soil erosion which is evident and posing a threat to peri-urban settlers. .

Impact of electricity power cut on lighting

The effects of power outages go beyond the annoyance experienced from the outage itself. In this area of study it was found that lack of electricity renders consumers vulnerable and are co-opting in the use of solar lighting, diesel lamps, gas lamps, torch batteries, paraffin and sometimes one or two who afford diesel powered lighting. Residential consumers acknowledged further their sentiments on power interruptions and its impact,

> *"The power quality and reliability is frustrating and options to shortage of lighting are one of our challenges."*

"Sometimes we end up using paraffin lamps and to some extent diesel lamps. The impact of these types of lighting are devastating to our healthy but we have no better option. What can we do when we do not have money?"

"Our children can not write home work, they can not study. There are several incidences of accidents that do occur from some of these lighting choices we use. Some houses have caught fire from candles and some from these poor lighting lamps"

In light of the above statements made by the residents, power lighting has proved to be a challenge to their quality of life. Out of the participants to the interviews 100% concurred that lighting is more challenging than heating since wood fuel may replace electricity heating. "*Power lighting has tremendous costs, especially to us from the low income group. My children's room was burnt to ashes because of the candle light."* says one resident. One of the reasons is that the city has traditionally depended solely on hydroelectric power from the national grid (Munowenyu, 1996). From the above reactions it seems to point out that shortage of electricity lighting is costing the consumers thousands of dollars. The spill over effects affects the children's education as poor lighting is not ideal in reading at night. More so some families do not even afford candles and the use of diesel and paraffin lamps may lead to ill health. Tuberculosis has also been associated with the household use of wood, as well as the chronic respiratory diseases such as chronic bronchitis; which has been found to develop in women after long years of exposure to the pollutants (World Health organisation 2002). The issue of supply and demand of electricity is constrained by financial impediments. This fuel causes cancer, asthma and other respiratory diseases. Simmons (1998) endorses that exposure to even low levels of diesel exhaust is likely to pose a risk of lung cancer and respiratory impairment. It is quite apparent from the situation during the time of the study that consumers' lives were at risk incited by unplanned load shedding. All this escalate to loss of health and life and depreciation of living conditions.

Many complains were also raised by the consumers. Residents who formed the focus group pointed out that,

"Once electricity is out we are on it. Criminals thrive their opportunities in the dark. Our lives are at risk. We are robbed, mugged, beaten, maimed, injured and killed in the dark. Although the police do some patrols many robberies and thefts are reported during the times electricity is switched off."

In addition to being responsible for deaths and injuries when they interfere with elements of day-to-day life, outages pose a real public safety hazard. When an area of a city loses power, police and fire-fighters must be diverted from protecting neighbourhoods to recovery operations and to make sure citizens are safe (Rouse and Kelly, 2011). The sentiments from the residents clearly underscore the costs that befall the community during absence of power light in the night. The costs of momentary interruptions at night are severe and unwelcome. *"The pedestrian has the euphorbia of criminals and even the one in doors is unsure on when the burglar would strike,"* said one participant. Such incidences spell the great impact of power failure during night time.

Conclusions

- Power outages result in hassles, inconveniences and immeasurable costs to residential consumers.
- The direct cost which occurs following an outage are costs of equipment damage, food spoilage, loss of light and generally deprivation from social activities, usage of certain essential appliances and poor living standards.
- The power supply to Mkoba high density suburb is very unreliable and the problem seems to have no immediate intervention for now and the future.
- The power outages have seriously undermined and causes customer's discomfort and anxiety both of which are intangible losses and cannot be quantified in monetary values.

Recommendations

Based on the findings of the study, the study comes up with the following recommendations:-

- The power utility company should try to encourage other forms of energy such as solar and gas for household cooking and heating to curtail electricity demand for short term consumption.

- ZESA through government needs to invest heavily in the generation, distribution and maintenance of electricity supply to consumers and other productive sectors of the economy.
- In spite of inadequate power supplies ZESA must professionally cede electricity power to consumers by exhibiting transparency in the way the energy is supplied. It must be rather fairly distributed to all residential consumers without any favour.

This study recommends further similar research be conducted nationally in order to have an in depth insight of the problems associated with power outages and thus the government can realign its policies for economic development.

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