

HOW DOES THE ENERGY CRISIS AFFECT SMALL-SCALE INDUSTRIAL WORKERS IN DISTRICT SWAT, KHYBER PAKHTUNKHWA, PAKISTAN

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ABSTRACT

Electrical energy is perhaps one of the most pivotal sources that had pushed human being to a substantial growth and development around the globe. It is considered one of the major indicators in socio-economic development of a nation specially since, the development of power bulb and advance means of production. However, the higher dependency over electric sources had led to gap between the supply and demand ratio of electricity throughout the world, particularly in third world countries like Pakistan. Consequently, the country Pakistan observing acute shortage and thus led to heavy load shedding especially in the remote and rural area of the country. The unannounced and frequent shut down of electricity directly and indirectly effecting each and every sector especially, the industries and their laborers in a very large scale. The current study has carried out with major objective to scientifically investigate the effect of loadshedding on small scale industrial sector and their laborers in District swat of Khyber-Pakhtunkhwa, Pakistan. The nature of the study is qualitative however, the primary demographic information has disclosed in frequency and percentages. As per the requirement of the study the convenient sampling techniques has utilized for collection of information from sample respondents. Further, a total of 30 sample respondents constitutes the sample size where ten each from Marble, Plastic, Garment, Silk and Cosmetic industries were studied randomly. Moreover, interview guide encompassing all the study variable was followed as tool of data collection. The data was then analyzed thematically with supporting literature review and secondary information. The result of the data discloses that due to heave power outages the industrial sector of the region has collapsed leading thereby to socio-economic and psychological problems challenges for the workers. Due to such unemployment and poverty, it was difficult for the workers to maintain their family expenditures and activities of daily lives. To avoid industrial unemployment and uplift industrial growth in the country and especially in the region, the government shall be practical toward the development of power sector. Priority shall be given to hydro generation as well as the industrial sector to be declared exempt of load-shedding throughout he country.

Energy Crisis, Small Scale Industries, Workers, Unemployment, Poverty, Swat KPK-Pakistan.

INTRODUCTION

Energy is considered a universal currency that perhaps pushed human being to significant development; mechanization and industrialization globally. it plays important role in our daily lives, operates machines, bring changes in shape of matter, provides sources for recreational, delight, entertaining, acquaintance, socialization, dispositional growth and more specially energy bring lenience and acquit in daily lives of modern world (Smill, 2004; Mehta, 2005). Human being used different energy sources for their socio-personal advancement and pecuniary development of subsequently stretched. Starting from the very basic and simple society of human being (hunting and gathering) the muscular power of mankind was the major source of performing work. With shift of simple society to agrarian the muscular power of energy was replaced by animal power especially in agrarians' base society. However, with the beginning of steam engine and electric bulb the general energy sources were transformed to energy (electricity) for effective functioning of substantial apparatuses with enhance productivity in western world (Liaqat, 2013). The study of Khan et al, (2012) show that due to speedy development, industrialization, overpopulation and excessive use of electricity for human advancement have witnessed greater dependency over electricity sources throughout the world. Due this frater dependency on electric sources gap between demand and supply ratio of energy has happened reputedly, effecting the general progress and expansion in the region, particularly the manufacturing sector and their workers in the world, specifically in emerging nations like Pakistan.

Energy

According to the physical definition, energy is the corporeal capability of a structure to do work and produce things (Stern & Cleveland, 2004). However, in this study energy has castoff for electrical energy or electricity which is as a main source of operating industries in the study area.

Energy Crisis

Industrial development and population growth have led to a surge in the global demand for energy in recent years and thus a gap has been created between demand and supply of electricity and

energy at the national level. Thus, the term has been used in the context of crisis leading to heavy load shedding in the area.

Load Shedding

A rolling blackout usually refers to as rotational load shedding or feeder rotation, is an intentionally engineered electrical power shutdown where electricity delivery is stopped for non-overlapping periods of time over different distribution lines in a particular region (Ziagos & Wedel, 2007). The rolling blackout are a last-resort measure used by an electric utility (Power Supply) to evade overloading in operating electrical grids and total blackout and shutdown of power system. In context of the current study, the concept of load shedding has been utilized for planned and unplanned blackout in the area which effect the industries and their workers in the study area.

Industry

Industry is usually concern with manufacture of goods or services within an economy or it is the major sources of a group or company is the pointer of its pertinent trade and engineering. In simple, when a large group has multiple sources of revenue generation, it is considered to be working in different industries. Manufacturing industry became a key sector of production and laborers in each country (George & Stigler, 1956). However, in the context of the current study, industry has been limited to small scale industry i.e. plastic, marble etc. in the area under study.

Laborers

The idea of workers and laborers are seminally used in all human society from very simple to modern especially after the industrial revolution, industrial development; the concept was modified to worker, usually related to those people who work for cash money on daily or monthly basis. (Pakistan Institute of Labor Education and Research, 2014). The concept of workers or workforce in the current study has been utilized for workers working in specified local industries engaged on daily wages, fixed pay for weekly or monthly basis.

Literature Review

It is a great shortfall in supply ratio relatively to demand of the population in a region. Since greater dependency over energy sources, and no more

focus on the development of the cheap energy sources, load shedding is a general phenomenon and usually remain a massive concern for emerging countries like India, Nepal, Bangladesh, South Africa and more specially to Pakistan. According to Shah, (2012) India's electricity demand is on the rise, driven by high population growth, the changing life style, higher electrification rates and rapidly growing economy. The annual growth in energy demand has estimated as 8% very recently, doubling the historical average annual growth rate of electric demand rates of the past thirty years. Whereas the power production sector of the country has been neglected, consequently, 9-10 hours load shedding in urban areas and up-to 12 hours in rural areas of the country has carried out on daily basis. Further, the problem of electric crisis is in more sever and intensive situation in Bangladesh. There are 4000 MW generation gap of power supply, leading to heavy load shedding in shape of every alternative hour in the country (Khan& Islam, 2012). In response to the challenges, the country has taken immediate measures to curb with the problem of energy crisis on urgent basis. In this regard, the government and concerning agencies has shifted the oil generation plants to thermal and Hydro generation power plants in the country. Due to certain technical and productions reasons the heavy flood of 2008, severely damaged and drowned the major electric generation stations in the country. Soon after the gap between demand and supply generation ratio, the country observed more than 20 hours power shut down per week (USAID, 2009). During power-shut down majority of the industrial sector remained closed, they constantly downsizing their workforce leading to sever job insecurity, poverty, unemployment, as well as high fertility ratio to the country (Saunder, 2002).

Energy Crisis in Pakistan

There are a series of socio-economic and political causes for ongoing massive power cut in country Pakistan. The very first is with the poor transmission and century old distribution of power supply system in the country. Besides, these technical and non-technical causes, the political interference in power sector, poor administrative and centralized power production system, less focus on the development of Hydro generation and increasing trends in electricity consumption as well

as numbers of consumers are powerfully influential grounds of load shedding in Pakistan (EIA, 2008). Further, inadequate imbursement to Pakistan State Oil (PSO), late and no payment to independent power plants (IPPs), inheritance of expense as well as abandon of future demands, electricity theft, commission and omission among power and distribution companies' employees and dogmatic disagreement concluded Kala Bagh dam, the country has been observing massive shut down of electricity of its history since last two decades (NEPRA, 2011; PDP, 2012; The Daily the Dawn, 2009; The Daily the Nation, 2014). The ongoing load shedding of electricity in Pakistan started in 2005-7, where the total production capacity of electricity production was about 12000 mega-watt against the demanding proportion of 19000 mega-watt. The shortfall increased and hit the digits of 9000MW, in June 2007-08 because majority of power station and IPPs were unable to afford oil for their operations (Haq, 2008). Consequent of huge shortfall, the power distribution companies observed 15 to 18 hours load shedding in urban areas while up-to 22 hours in rural area of the country. Such massive blackout produces many negative consequences and decreasing of overall GDP of the country (Saleem, 2013). Besides, the massive power cut negatively targeting the domestic and commercial consumer as well as general people in all walk of the country. As electricity is mandatory for operating machines and its short fall severely hit the production capacity of industrial sector as well as their laborers badly. Majority of the large- and small-scale industries remain closed consequently downsizing their workforce, leading thereby to other socio-economic and emotional problems for deprived employees of the segment. Due to such unexpected joblessness of workforces, these workers feels problematic to maintain their every-day expenditures, especially house rent, children education, health, special culture celebration and spiritual centenaries. Such inconsistency additional leading to radical upsurge in delinquencies, mainly street crime like target killing, rubbery, theft, kidnapping, smuggling etc. (Zeshan, 2014).

The cited literature discloses that unannounced power outages exist in the country and had much disunite influence on the industries, their owners and workers leading thereby affecting the socio-

economic and psychological well-being of the workers in study population. Keeping in view all these secondary information this research study has been carried out to scientifically examine the ongoing energy crisis and its effect on small scale industrial workers in District Swat.

Methodology

Research is always a systematic way to be followed for solving a question or producing an answer to uncertainty with the help of some procedural rules including study the issue, experiment, observation, analysis, comparison and reasoning (Rajasekar, 2013). Thus, research is performed under special procedures known as methodical procedures. Research methodology thus includes, numerous phases implemented for to give answer to research question align with study objectives scientifically.

Nature of the Study

The current study is qualitative in nature, where both secondary and primary information attempting to label the spectacle in feature. Further, the secondary information of the study, the researcher has carried out a detail review of literature in which special attention has been given on selecting the papers, books, journals and particularly, internet sources. As the current problem of electricity crisis is very new and thus very low secondary data is available on the problem, therefore the researcher taken majority of the data from newspapers and internet sources. Further, the extracted information from these sources including have been cited in thematic order. In explanation, a qualitative study focuses primarily on information involving in-depth analysis of phenomena with no such use of statistical or numerical techniques to provide measurement of quantity (Allyan & Bacon, 1992). The current study is primarily based qualitative research design; thus, a detail description of the field data has been made and views of the participants have been thematically approached to produce and test the given propositions. However, the personal information has been obtained regarding age, gender, economic position, level of education and family, thus quantitative analysis is used because such analysis explore each variable in a data set separately, look to the range of values on the basis of some statistical measurement in the form of current tendency, average, frequency as

well as cross relationship as well. Thus, the same approach has been adopted to analyze the personal information while the objective based information has been discussed under separate themes.

Universe and Population of the study

The current study has carried out in District Swat and Mingora city, of Malakand division of Khyber-Pakhtunkhwa, Pakistan. Moreover, the study has been delimited to manufacturing sectors of the city where thousands of workers and their families are directly and indirectly related to industrial services, and thus the workers of these small-scale manufacturing sector constitute the population of the study.

Sampling Procedures

Based on the requirement of the study convenient sampling technique has been utilized as this is a non-probability sample techniques mostly followed in market study and qualitatively survey. Further, a total of 30 respondent from ten selected industries (three from each specified industry), with specification to those industries have no backup electricity supply sources were studied.

Data Collection

For collection of primary information from sample respondents in the study population the interview schedule encompassing all the study variables alongside demographic information was formulated and advanced in the field.

Interviewing and recording

After the development of a well-structured tool for data collection, the researcher visited the selected industries and after taking consent from owner, manager, as well as workers of the manufacturing sectors interview were directed from the sampled respondents in a detached room to circumvent an unpleasant situation. Besides, the researcher continued to record the interview in cell phone as well as in papers which were then translated to English through transcription.

Data Analysis

After the completion of primary information, the collected information was further proceeded through various stages, i.e. transcription, coding, classification and editing, finally the description was made about various themes under thematic

analysis. However, the personal information has been presented in form of table with relevant frequencies and percentages.

Ethical Consideration

The current study is conducted by following ethical standards and the full confidentiality, dignity and respected has been sourced.

Results and Discussion Section-A Personal Information

Age and Marital Status of the Respondents

The field information in table no-1 regarding the age of the sampled respondents disclose that 4 no

workers age was from 24-30 years, 05 no of workers were 31-37 years, similarly, 05 no workers were in category of 38-44 years, while majority of workers (08) age were in category of 45-51 years. further, a very low portion of sampled respondents were noted as age group of 52-58 years and 07 numbers out of total (30) sample workers age were observed above 59 years. Moreover, the field data show that majority of workers (16) out of 30 were married, 12 out of 30 were unmarried while very low portion of sampled workers (2) out of 30 were found engaged with regards to marital status of the respondents.

Table –I Age and Marital Status of the Respondents

Age	Frequency	Percentage
24-30	04	17
31-37	03	10
38-44	05	17
45-51	08	27
52-58	02	7
59 and above	07	23
Total	30	100
Marital Status		
Married	16	53
Unmarried	12	40
Engaged	02	7
Total	30	100

Education Qualification and Nature of Profession of the Respondents

The given data (as presented in tabular form with frequency and percentage) about the education status of the respondents clearly demonstrate that 09 (30%) of the sampled workers were uneducated, whereas rest of sampled workers were literate. Further, among the educated workers 05 that is 16% out of 21 workers have primary education, 09 that is 30% have middle level of education, similarly 06 (20%) having matric qualification while only 1 no of sampled workers out of total educated workers (21) was found with F.A/F.Sc. level of education. In context of nature of profession, the table disclose that 04 (13.3%) of the sampled respondents were permanent laborers of the industries, 23 (76.6%) were working on daily basis while 03 (10%) were working on monthly

basis in specified sampled industries. This information thus clearly indicate that majority of the sampled respondents were educated, however, the level of education varies from group to group and levels i.e. from primary to high and higher secondary level. Further, the involvement of educated people in manual work is justified due to non-availability of the employment and jobs in the government industries in universe of the study. Furthermore, mainstream sampled respondents were working on hourly basis where the income of such respondents be contingent on their production they produce on daily basis. Further, due to electric load shedding and crisis in the area, these workers were severely affected and were found in serious socio-economic issue.

Table-II Education Qualification and Nature of Profession

Education Qualification of the Respondents	Frequency	Percentage
Illiterate	09	30
Primary	09	30
Middle	05	16
Matric	06	20
F.A/F.sc and above	1	04
Total	30	100
Nature of Job		
Permanent	04	13.3
Daily Pays	23	76.6
Monthly Base	03	10
Total	30	100

Field Survey; 2024

Monthly Income and Number of Dependent Family Member

The income level of the respondent determine the standard of life, problem associated and the inequality persisted among factory workers, which is the focus of the current study. Such information in the current study is an important indicator to know how electricity shutdown effect the working hours, income and family well-being, which further, leads to inequality and socio-psychological problems for factory workers. The income of the sample respondents is presented in Table no-III, illustrate that most of the sampled respondents have very love level of income i.e. 19 (63.3%), which range between 5000-9000. Further, 05 no of sampled workers income were note in range between 10000-14000, 04 (13.3%), of workers

income were in range from 15000-19000, while very low portion of sampled respondents income were noted as above 20000 rupees in the study population. Similarly, the table on dependent family member demonstrate that 07 no of sampled workers dependents family size were 0-4 members, 17 no of workers (56.66) dependents family members were noted 5-9 members, 05 no of sample workers family size were 10-14 no while only 1 workers' family size were above 15 dependent family members. Thus, it is obvious from the tabular information that majority of the respondents have 5-9 family dependents members. Further, it is worth mentioning that the earning/income and the expenses made by an earner on 5-9 dependents in a crisis situation is difficult to provide basic facilitation of life.

Monthly Income and Number of Dependent Family Member

Monthly Income of the Respondents	Frequency	Percentage
5000-9000	19	63
10000-14000	05	17
15000-19000	04	13
Above 20000	02	6.6
Total	30	100
Number of Dependent Family Members		
0-4	07	23.33
5-9	17	56.66
10-14	05	16.66
Above 15	01	3.333
Total	30	100

Field Survey; 2014

Section-B

The section B of the study comprise of analysis of the primary information which has presented in thematical form of analysis alongside with relevant discussions. The thematical analysis is refers to qualitative analytic method for identifying, analyzing and reporting pattern (themes) within data. It minimally organizes and describes the data set in rich detail. However, frequently it goes further than this, and interpret various aspect of the research topic (Braun & Clark, 2006). Though it is rarely acknowledged but it is a common method of qualitative data analysis employed field as well as societal, behavior, and health sciences. Further, this analysis contains of regarding through textual information, devising and identifying themes therein, and further to interpret structure of the themes and the contents there in. Thus, in this part of the study different themes have been developed, analyzed and discussed with supportive literately information whereas an attempt has been made to maintain anonymity of the sampled workers in align with ethics of the research.

Load Shedding and Unemployment of Laborers

The study of Hussain et al., (2012) show that common people and industrial workers are more severely affected by ongoing massive power outages in the region. It is affecting jobs and livelihood and is sinking our economy to a great extent. Since 2008, Pakistan has been experiencing challenges with regular disruption to its electricity supply. And this maximizes the inconvenience and inevitable disruption to business and household alike (Khan, 2007). Similarly, according to the field data and analysis of information, unemployment varies from situation to situation and factory to factory but it is obvious that sudden and unexpected condition arises from heavy load-shedding which has various socio-economic and psychological consequences on the industrial workers. Due to sever power crisis in the study area, the unemployment ratio has been increased for industrial workers because most of the factories have been closed down and even majority of the factory management have downsized their labor force. In this context, a respondent also supported the notion in the following words:

“..... During the heave and unplanned Load-shedding, our factory management is facing problems for hiring workers and even most of the

workers have been removed from the jobs. This is direct impact of load-shedding on the labor working and we have no option for life and survival...” (S-2-35-4-06).

Further, the field information of sampled workers discloses that, all the small industries of the locality were relaying on electric machines and the black-out have undesirable moments of the manufacturing outputs and their employment as well. Most of the factories are considering cutting down the cost of production through downsizing in their workforce, which to them is an assault on the workers. The respondents thus considered it an increase in the dearth, joblessness and disparity of the industrial workers in small-scale industries. In this milieu, a quotation from an interview of respondents has been given:

“.... The small-scale industries of the locality are totally dependent on electricity and due to heavy short fall of electricity, I am facing many serious consequences in my domestic management. My purchasing power has been reduced to greater extant and I am asking for loans from the shopkeepers and other friends and relatives....” (G-03-58-04).

Likewise, majority of the sampled workers responded that due to sudden exertion from industrial services usually leading to other socio-economic and political disturbance in the industrial zones leading thereby to law-and-order situation in the region. As soon the industries collapsed, they downsizing their work strength without alternative job and prior notice. In this connection one of the sample worker replied:

“.... In my factory, at least 150 workers have been expelled from the work during the last three months and only 43 workers are working but he earning capacity has been reduced to a great extent. We are dependent on power and only a small percent of workers is busy in work to earn”(D-5-44-09-07).

The ongoing massive power outages that have gripped the area during the since last decade have also had a major impact not only on the economic and political but also the social well-being of the industrial workers. The crisis has been identified on the industrial workers in term of its direct and trickle-down effects i.e. between availability and the level of social human development as most of the respondents were found in sever crisis of managing their domestic expenses and even to cure

health and treat family members. It is thus evident that the crisis of the load-shedding has torn into the social fabric, economic aspect as well as the everyday life of the industrial workers.

Load-Shedding and Poverty of Laborers

Energy is compulsory for advancement of a region and is thus directly correlated with vigorous financial progress (Kaseke & Hosking, 2013). Likewise other Asian the country Pakistan is too much passing from transition from agrarian base economy to industrial one. However, still now a very low portion of the country is related to electricity. The people actually have power experience difficulties around 61% of the time (Aliyu et al., 2013). The economy of the country is shaking one and the resources to generate energy is miserably utilized (Global Energy Network Institute, 2014). When power fails, the laborers of the sector may be trapped in their pounders, which leads to economic difficulties and poverty risks to the workers (Kaseke & Hosking, 2013). The area under study also relies on the operation of machines in factories while the main source to run in the machine is electricity. As observed from the data, the crisis of energy supply remains for more than 16 hours a day, where the factory work remain interrupted and have many pecuniary and communal significances for both the owners and laborers of the sector. As told by a researcher:

“...The heavy and unannounced loadshedding and interrupted electric supply has suspended consequently the majority of the workers suffers and due to sever outages, the industrial sector in which we are working is deprived of regular income. Our factory is in total loss and has severe impact on the poverty ratio of the workers....”(S-3-10-51).

Lack of electricity also causes problems for workers to produce products well in time and they have to work for more than their limit with no proper routine. However, it has been noted that energy grid is arguably in electric shortages due to lack of expansion and here is no such urgent alternative to resolve the issue (Harrison, 2005). The people in general while those associated with the industrial economy have been crippled down due to crisis in supply of electricity (USAID, 2013). From the analysis of the field data, people of the locality and particularly the workers depend on factory works were worried about their

employment and income. Further, they were compelled to search for other income and other energy sources as well. In this context, a respondent replied as:

“.....In my life of 30 years, I have earned daily wages working habit and I have no skill other than this. Due to crisis of energy or load-shedding, most of the time I remain without work in the factory and I am trying to search for another work because now I am in dire need of earning to endure my existing in the community and fulfill the socio-economic and culture happenings of my household....”(M-1-0-09).

The literary information further indicate that the shortfall of electricity has leads to overuse of generators for energy and it is estimated that about 20% of the domestic and 10% of the industrial energy is produce in this manner. Further, currently the government has no such immediate plan to help solve the energy crisis for the industrial sector in Pakistan. The country has a reputation of having high level of corruption at the administration and government level affecting the energy sector as well (Jamil & Faisal, 2013). In this context, the field information provides similar results and the majority of the industrial workers and management has no alternative resources to cope with problem of electricity crisis. Further, most of the respondents were of the opinion that the root of corruption especially in energy and power department have devastated the system and economy of the country as well as the income status of the industrial owners. A respondent explains the same situation as:

“.....People are using illegal means to use electricity and do not pay the bills and taxes to the government. The government employee and power supply department are also involved in providing illegal connections to the factory owners which not only creates energy crisis in the country but also effect the common people....”(S-6-34-07-05).

This is factual that the Pakistan is passing through developmental phases but the substitute form of electricity is not used probably because of the non-availability of experts or non-seriousness of the concern section. Currently the country is utilizing four different types of energy; natural gas, oil, hydro and coal. However, the energy sector is heavily depending on hydro method for electricity production, which has slowed down the development of alternative form of energy because

of no development since more than 20 years (Jamil et al., 2013).

Conclusion

Since the starting of current energy crisis in Pakistan in 2005-6, the country went through surplus electric generation. The ongoing energy shortages started in year 2005-7 and had crossed the level of 6000 megawatt several time during the mid-June of year 2011-2012 and had exceeded 7000 megawatts accordingly. This flaring demand has resulted in regular load-shedding of 10-12 hours in urban areas and 18-20 hours in rural areas of the country. The massive and unannounced load-shedding in the Pakistan has severely rubs the country economy and industrial development. Industrial production has been severely hit consequently the sector face challenges and constantly downsizing their work strength. Majority of the industrial sector remain closed which further leading to unemployment of workers and poverty. The field data reveals that alongside other socio-political impact, the unemployment and poverty of workers, the workers are constantly worried for their family affairs and daily routine, leading thereby impact on the socio-personal well-being of the workers. Thus, the study conclude that the energy crisis (load-shedding) is the most burning and major issue of in the country has created many problems for industrial workers especially for small scale industrial workers in the study universe.

Recommendation

To minimize the effect of power crisis on over all sector especially, on small scale manufacture sector of rural area and their employment, the concern agencies and governments department take practical and leading action for eliminating load-shedding and facilitating industrial sector and their laborers for uninterrupted back up sources. In this connection the concern bodies must resolve the problem of energy crisis on special priority level. The power development policy must launch without any political gain. Focus must be given on hydro generation development and consent on Kala-Bagh dam shall be made by all stakeholders and provinces of the country. Further, to minimize the consequences of load shedding on small scale manufacturing sectors, the government should clearly declare industrial zones in the country. The industrial zone shall be exempted from massive

power outages whereas in case of emergency, technical and environmental faults, the load-shedding shall properly announce. Moreover, the government must provide job security to industrial workers, especially to small scale industrial workers and shall provide them permanent services like other departments and ensure minimum wages in any of the situation. Through these attempts manufacturing sector of the region and their labors will go easy for speedy production with no job insecurity, thus will powerfully contributing to local and national economy.

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Dedication:

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