

The Impact of Energy Crises on Industrial Sector in Khyber Pakhtunkhwa

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Abstract

Energy is the backbone of economic development, and its shortage poses serious challenges to industrial growth and sustainability. Pakistan has been experiencing persistent energy crises characterized by electricity shortages, load shedding, and rising energy costs, which have adversely affected businesses and industries. This study investigates the impact of energy crises on the industrial sector of Khyber Pakhtunkhwa, with a focus on Peshawar Industrial Estate. A quantitative approach was employed using survey questionnaires distributed among 100 firms, supplemented by interviews and observations. The findings reveal that energy shortages have led to reduced productivity, declining investments, unemployment, increased operational costs, and closure of several small and medium enterprises. The results also highlight dissatisfaction among industrialists regarding government efforts to resolve the crisis. Statistical analysis confirms a significant negative relationship between energy crises and industrial performance. The study concludes that energy shortages are a major constraint on Pakistan's economic growth and industrial competitiveness. Recommendations include consolidating energy institutions, encouraging investment in renewable energy, and offering tax relief or subsidies to industries to mitigate the crisis.

Keywords: Energy crises, Investment, Unemployment, Khyber Pakhtunkhwa, Peshawar Industrial Estate and Pakistan economy

Background

Energy resources are the vital component of any successful economic country, it is also considered as the life line or back bone of any successful nation. Humans have prospered when they invented and discovered the use of energy for their activities and since human civilization has been making the best use of the energy for the development and prosperity of their life (Abbasi, 2019). According to Asif (2019) sufficient amount of energy is required by different nations to improve their economic activities and growth, they also require energy to improve the life standard of an individual and eliminate the ills of poverty which prevails in the countries which are economically undeveloped or underdeveloped. Additionally, he was of the view that individuals' energy consumption is a special indicator to find out the socio-economic development in any country (Asif, 2019).

The human population has increased drastically, if one observes the history of human civilization, with such increase their need for energy has also increased drastically. According to the report of United Nations, by 2050 the human population will increase by 9.1 billion in south Asia and African countries which will result in more demand for food and of course energy resources but as the population is growing the demand for energy resources are increasing with deflecting of non-renewable resources. In Pakistan electricity consumption is more than the supply that is not only affecting social life but the economic growth too that is declining day by day. These entire crises in energy sector are ruining the economy of the country (Agha, 2018). The energy source in Pakistan is the backbone of every sector whether that is agriculture, industrial, commercial or any other sector. It is the most vital component of life developing and improving condition of people in the country. Electricity is not only requirement of household activities but also important component in development of economy. It provided employment

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opportunities to people in the country. It is one of the contrasting factors among developed and developing countries. Pakistan is presently facing a serious energy crisis. Despite strong economic growth during the past decade and consequent rising demand for energy, no worthwhile steps have been taken to install new capacity for generation of the required energy sources. Since, the demand exceeds supply and hence "Load Shedding" is a common phenomenon through frequent power shutdowns. Electricity consumers across the country had a bad day on Sunday, when the gap between the demand and supply kept fluctuating between 5,000 to 7,000 megawatts, resulting in extensive power cuts of seven to 10 hours. The Ministry of Water and Power said the demand crossed 20,223MW at 8pm, compared to peak generation of 15,400 to 15,700MW, a shortfall of 4,786MW (Iqbal, 2019).

Electricity shortages have been causing substantial damage to Pakistan's economy and constitute a binding and powerful constraint on the country's growth. They constrain growth in terms of GDP unavoidable and have very significant negative impacts on employment, international competitiveness and exports, and poverty alleviation. For the ordinary citizens, extensive load shedding is causing significant disruption of their daily life. For the industrial, commercial, and agricultural users, the cost of the rise in power shortages have been enormous. Pakistan's industry has been effectively crippled. The textile sector source of over half of the country's exports and about 40 percent of its manufacturing jobs-has been hit hard. Especially small businesses have been paralyzed (Kardar, 2019). Up to 10 hours of load shedding in cities and 15 hours load shedding in rural areas are going on across the country.

Problem Statement

The energy crises did not emerge suddenly. It is the direct result of imprudent and reckless energy policies over the last three decades that impeded the development of cheap and abundant domestic energy sources. Pakistan's energy bankruptcy is ultimately due to massive institutional and governance failure. During this research work the researcher explores the causes of energy crises in Pakistan and its impacts on industrial sector. Government is making all efforts to increase and diversify its energy supply with long-term vision of the power sector to meet Pakistan's energy needs in a sustainable manner. Pakistan has embarked on wide-ranging initiatives. Till now government remained successful in attracting foreign companies to undertake new exploration and production activities. The China-Pakistan Economic Corridor (CPEC) will also become a source of coordination for developing energy related projects through indigenous energy resources such as coal, hydro and renewable sources.

Significance of the study

The purpose of the study is to explain the effect of energy crises on industrial sector of Pakistan. The research has been generalized by studying the industrial and economic development of Peshawar industrial estate. The present study has tried to reveal the problems faced by the different industries operating in Pakistan suffering due to shortage of energy for their business operations.

Objectives

The study includes the following main objectives to be studied in the conduction of the research.

1. To seek whether there is any impact caused by the energy crisis on the major industries of Pakistan.
2. To find if there is a negative impact of the energy crises on the businesses of Peshawar, Pakistan.
3. To find out the decline in the businesses of the industrial sector in Peshawar.

Research Question

1. What is the impact of energy crisis on major industries of kpk?
2. What is impact of energy crisis on business of Peshawar Pakistan?
3. How Are businesses in industrial sectors declining?

Literature Review

Pakistan energy problem

Companies working in Pakistan have a break down lot and their profit margin has reduced by an important portion just because of the lack of energy prevailing in Pakistan. This thing has impacted not only the sectors but individuals at large are being impacted. The govt. must support the market market so it can boost up the overall

picture is that Pakistan is experiencing extreme deficiency in energy market mostly in phrase of energy. The market is a backbone which not only gives the nation its rightful picture in the entire globe as string economic system but as well as enhancing the quality of life of individuals residing in a nation (Ahmad, 2019). Pakistan's energy issues began in 1990s. The problem raised in 1970s, with the launched of large dams i.e. Mangla and tarbela leading to brief time of robust hydro-driven energy creation which ably responded to requirement. A deficiency of 8500 megawatts (MW) was observed in June 2007 i.e. 40% of country's requirement. Since then, Pakistan is experiencing acute energy issues (Business Recorder, 2019). According to Khan and Begum (2019) Pakistan has missing its labour energy because of the downsizing of the companies as the companies were not in a position to manufacture or generate goods as required due to brief fall of energy. On the other hand they also supported the argument and said that the govt provides already less energy to the sectors in summer time and stops the gas offer in the winter months season due to which companies companies have flattened and greater part had to shut down as they were un able to cope up with the problem created everywhere (Khan & Begum, 2019). Research shows that the ability prices and the burden losing are unfortunately the govt created which is not able to give the required quantity of other types of types of energy to the professional market of Pakistan. However it has been observed by reading the record of WAPDA that professional market is the significant customer of energy in Pakistan but Pakistan has not given much attention towards the effective manufacture of types of energy and greater part of the companies has experienced due to no or low provision of energy and other energy resources which is not enough for the development purposes of the organization (Kardar, 2019),

Another problem that residing standards have been reduced as Pakistan's is affected by serious energy downturn that has begun in 2000 and kept on improving due to the neglecting approach of the govt and other responsible authorities. individuals missing their tasks in large numbers as organizations couldn't bear the price of having employee, most of their financial commitment was on to make use of electrical energy resources to run their company so the price was paid by the large numbers of labor and inductors in Faisalabad , Karachi and Peshawar was impacted at bigger hence individuals could not manage their basic needs anymore which lead in the improved amount of poverty. (Kugelman, 2020). The little method companies became extinct from the market as they could not work with the given quantity of energy to the market especially to method and small-scale companies. They were not in a position to run their companies effectively and efficiently. The problem aroused when the govt declared fill losing of gas in the winter months season and almost no light for 20 time in summer time, in such circumstances it was difficult for businesses to run and make earnings (Muhammad, 2019). Pakistan's 38 percent income from the professional market has impacted due to energy issues. Investment has been impacted and traders are no more interested to invest their money in companies in Pakistan as they see no more earnings. The companies are unable to restore their initial price and the financial commitment has reduced not only nationally but internationally. Worldwide investor seems two factors as main barrier in Pakistan for companies on is terrorism and the other is lack of energy especially energy (Abbasi, 2019). If Pakistan remain an energy lack condition it will soon get flattened as its economic system is dependent on resources and loan by globe financial institution and IMF, and these organizations not only seek enhancement but enhancement in professional market and the professional market is not showing and significant enhancement or development and it's on the verge of getting default after 20 decades. For objective to overcome the deficiency Pakistan has entered Iran Pakistan gas pipeline to match the requirements of gas for public and personal market which includes every area and customer of gas in the nation (Asif, 2019).

Businessmen has begun investing money in property company that is why the property and rents rates have gone excellent that again is a big problem for middle-class community of Pakistan. In Pakistan greater part of individuals belongs to middle-class society, therefore they simply can't manage houses for residing. Pakistan 's professional areas has experienced but it has its proper standard of life; significant effect on individuals of Pakistan. Inflation has improved due to loans taken by international organizations. At the same time the govt in such scenario is not offering any tax relive to companies so that they can deal and come up with ways of cop up with energy issues. For many decades Pakistan has experienced financial issues since independence but it got out of control when Pakistan experienced energy downturn issues. It's not only the professional market but the social interaction of individual, their enhancement and development has been reduced due to the ills of energy downturn. Pakistan has different types of energy available and it can become self-sufficient but it has not exploited those reserves and the infrastructure for the exploitation is not fully capable and supportive (Nazar, 2019). A nation without of adequate quantity of energy can never become a developed nation as it cannot offer the opportunities to individuals who include organizations and individuals to become successful. It cannot attract foreign and nationwide financial commitment from individuals because there is no such attraction for the traders in Pakistan as contrast there are many other reasons available for not to invest in the nation. Energy issues in Pakistan is a serious problem and it is confirmed that the nation is an energy lack condition. The govt should wake up before it too delayed. The nation is in such circumstances where there is no chance to face any other organic calamity or any other problem as Pakistan is becoming economically weak day by day (Khan & Begum, 2019).

During summer time need for energy increases every year and it cannot be fulfilled by any other resource. Billions of rupees have been submitted under debts but hydel tasks of giving cheap energy are enduring due to lack of funds in development market. Our govt should take into consideration the creation of energy from hydel energy resources. (M.Asif and T.Muneer, 2017). Pakistan has the availability of all large organic resources that are required to generate energy, real treatment for meet the ability requirement of nation but they are never been utilized properly. As result Pakistan's financial, professional and social development is greatly experienced. Hundreds and maybe thousands of production units that don't contain their own energy creation potential like producing energy through heavy generators are in some cases through solar systems. These manufacturers are closing down with the truly amazing failures in causing excellent amount of lack of employment in nation. According to some statistics the current condition on the ground is in a condition of enhancing after the change of govt, but in some cities it is moving towards most severe conditions. Load losing in some areas has improved from six to eight time in whole day to twelve to eighteen time. Due to a excellent energy brief fall Pakistan has a trade lack roughly about (6.19) truly which was (3.85) in 1983. (Mustafa, 2021).

The objective of the study is to focus on how the ability issues has effect on Pakistan especially the professional market. In the study it is found that the effect of energy issues in the Peshawar professional market. Which will give us a clear picture of how the ability issues has impacted the overall country?

Methodology

There are two basic types of commonly used variables in this particular study that is energy crises and industrial sector of Peshawar. These energy crises have significant impact on the industrial sector. Energy crises are the main hurdle in the economic growth of Pakistan at this very moment and the biggest issue of Pakistan. The industrial sector is the backbone of the country and it has been observed that businesses have been suffered a lot since the issue of energy raised in Pakistan

The research study explains the impact of energy crises on Pakistan. For this particular reason the researcher has chosen to study Peshawar industrial estate to know the impact and generalized it on the Pakistan overall industry.

Hypothesis

H₁: There is a negative impact of energy crises on industrial sector of Peshawar, Pakistan

Research Methodology

The research required data from different firms' operation in Peshawar. That's why simple random technique was utilized for this purpose. It is believed that the industrial estate will give a clear idea of how far they coping and operating when they are facing energy crises problem and how they are able to deal with this problem. The questionnaires were distributing in a sample of hundred businesses in industrial estate to study the above-mentioned variables in the study. The primary data collected through a proper questionnaire, this questionnaire is distributed among the required or selected place i.e college, school, village and agriculture sector. All the designed question very simple and cover the all needed and basic information. The purpose of the survey and study also disclosed with the responded. Some needed information was obtained through face-to-face meeting. The personal watching also been recorded to addition the primary data collected through survey.

Theoretical Framework

In this research there are two variables i.e. independent and dependent variables. Industrial sector of Peshawar is dependent variables because it is affected by the energy crisis that's why this factor is termed as independent variables because this factor is the real cause of downfall in the industrial sector which is dependent variable

Analytical Technique

"The analytical technique designed for this study consists of data from the questionnaire, which consists of various tabular representations and graphic representation of analyzed data collected from the industries through questionnaire and interviews. Various terms have been used in the approach discussed as under:

Explanation of parameters that I have considered in this study.

Investment

In economic theory or in macroeconomics, Investment the amount purchased per unit time of goods which are not consumed but are to be used for future production. Examples include railroad or factory construction. Investment in human capital includes costs of additional schooling or on-the-job training. Inventory investment refers to the accumulation of goods inventories; it can be positive or negative, and it can be intended or unintended. In measures

of national income and output "Gross Investment" (represented by the variable I) is also a component of Gross Domestic Product (GDP), given in the formula $GDP = C + I + G + NX$."

Where C is consumption, G is government spending and NX net exports. Thus, investment is everything that remains of total expenditure after consumption, government spending and net exports are subtracted (i.e. $I = GDP - C - G - NX$).

Investment is often modeled as a function of Income and interest rates, given by the relation $I = f(Y, R)$. An increase in income encourages higher investment, whereas a higher interest rate may discourage investment as it becomes more costly to borrow money. Even if a chooses to use its own funds in an investment, the interest rate represents an opportunity cost of investing those funds rather than lending out that amount of money for interest.

payments, rents and other forms of earnings received in a given period of time. for firms, income generally refers to net-profit: what remains of revenue after expenses have been subtracted. In the field of public economics, it may refer to the accumulation of both monetary and non-monetary consumption ability, the former being used as a proxy for total income. in economics, factor income is the now (that is. measured per unit of time) of revenue accruing to a person or nation from labor services and from ownership of land and capital. In consumer theory income is another name for the budget constraint an amount Y to be spent on different goods x and y in quantities x and y at prices P_x and P_y . The basic equation for this is $Y = P_x x + P_y y$.

This equation implies two things. First buying one more unit of good x implies buying Y/P_x less units of good y. So, Y/P_x is the relative price of a unit of x as to the number of units given up in y. Second, if the price of x falls for a fixed Y, then its relative price falls. The usual hypothesis is that the quantity demanded of x would increase at the lower price, the law of demand. The generalization to more two goods consist of modeling y as a composite good.

Employment

Employment refers to a situation in which every able-bodied person who is willing to work at the prevailing rate of wages is, in fact, employed. Alternatively, it is a situation when there is no involuntary unemployment. Every economy in the world aims at achieving the level of full employment equilibrium where all is available resources is fully and efficiently employed because it leads to maximum level of output. This is conceptual meaning of the term full employment. In practice, the concept of full employment generally refers to full employment of labor force of a country. In a macroeconomic perspective, a level of employment depends on levels of economic activity (broadly measure by GDP) and no intensity of labor per unit of product. An important role is played by institutional arrangements on how to react to slow-downs in GDP. Employment in a certain activity may be sealed up by the number of employable skilled people and by timing, contents and effectiveness of vocational training. job openings signal to external population that a job is available, either training' because of a previous co-workers firing / retiring / moving along or away the career ladder or because of addition of a new job place (for higher production or a new production)

Results and Discussion

- The researcher have investigated in question number one 50% people agree that energy crisis a serious problem, 35% people strongly agree, 10% were uncertain about the question asked while 5% are disagree they don't consider energy crisis a problem.
- In question number 2 60% people were strongly agree, 25% respondents were agree, 10% respondents were uncertain and 5% people disagreed that they are not worried about future regarding energy crisis.
- 55% respondents agree that load shedding is affecting the daily activities, 35% are strongly agree while 10% were disagree about the effect.
- When investigated question number 4 it is observe that 60% respondents were uncertain, 20% agree, and 10% disagree that electricity promises bright future.
- 50% people are of the view that due to energy crisis workers are being terminated, 10% are uncertain they are of no view.
- 50% people were unsatisfied with amount of energy, while 10% were uncertain.
- 80% respondents were disappointed by the government role in helping the industrial sector to come out of the problem, 5% were of no view.
- When asked about the solving energy crisis by the government 45% respondents were disagree, 15% were in hope of better future, 10% were uncertain,
- 50% respondents were of the view that businesses cannot flourished in the situation of energy crisis, 15% respondents were uncertain.
- In the graph 60% is showing negative response of the respondents, 5% are uncertain.

- 60% respondents were unhappy with the rise in unit price of electricity, 15% showed interest.
- 55% people agree that industrial sector is affected by the energy crisis, 5% uncertain and 5% disagree about the effect of energy crisis on industries.
- 75% agreeing that in last ten years business operations have reduced, while 25% strongly agree.
- 55% respondents were strongly agree that energy crisis is the major problem of the country.
- 70% people says that their standard of living dropped due to energy crisis, 5% people were uncertain.
- 45% respondents are of the view that businesses cannot earn profit, 25% were uncertain.
- 50% respondent's response that investment has reduced due to these problems, 15% respondents were uncertain.

Conclusion

The results explain that there is different perception of energy crisis when the businessmen or industrialist were asked some questions based on the energy crisis and the business operation and other related important aspects. People perceive that energy crisis is a major problem in the country. It has been one of the reasons behind the termination of labor jobs in the industry. The businessmen are not satisfied with the government initiatives and they are of the view that the government is not able to solve this issue so far. They are also seemed to be worried for the future of their businesses in corresponds to energy crisis in the country. The businessmen showed disappointment on the amount of energy resources provided for their business operations. It was found that businesses are unable to earn sufficient profit due to increase rate of electricity and gas prices offered by the government. The result also proved that investments have decreased due to energy crisis and they don't see a bright future for their businesses in such scenario. They thought energy crisis one of the main issue behind the dropping of living standard of everyone in the society. After running regression it was found that there is a negative impact of energy crisis on industrial sector of Peshawar. It can be easily said that if one region has affected that much so Pakistan on overall must have been suffered the same. Therefore it can be concluded that energy crisis has negatively affected the Pakistan at large in terms of economic growth. Therefore, hypothesis H1 is accepted.

Recommendations

- The government must focus on the industrial sector as the major consumer of energy resources is the industries which are the blood life of an economic state.
- A short term fix that could being immediate relief is to request a new loan from international monetary fund.
- Pakistan need to offer subsidy or relaxed taxation offers to ease the operation of businesses in such crisis issue.
- Pakistan needs to focus on the businesses activities in the country and make sure that small and medium businesses are operative in such energy crisis.
- Pakistan government needs to motivate business investment not only at national and international level.
- Pakistan should consolidate its many energy related institutions into a single ministry. This will bring some urgently needed order and efficiency to its dysfunctional energy sector.

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Conflict of Interest

The authors affirm that no conflicts of interest are linked with this publication. The research was conducted autonomously without financial or non-financial assistance from external entities.

Author Contribution Statement

The author meticulously crafted the study, devised the methodology, executed the investigation and data analysis, composed the original manuscript, and undertook the review and editing of the document. The author autonomously executed every aspect of the research and the development of the manuscript.

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