Impacts of Energy Crisis on Socio-Economic Status of Textile Industry Workers in District Faisalabad

Farhan Ahmad Faiz, Shehwar Fatima, Aman Ullah

Department of Sociology, Quaid I Azam University, Islamabad, Pakistan

Abstract: The present study explored the effects of the energy crisis on the socio-economic status of textile industry workers in the district of Faisalabad. It also investigated the impacts of the energy crisis on industrial production and scrutinized the change in productivity of employees due to the energy crisis. It deciphered the impact of the energy crisis on income, working hours, wages, and behavior of workers. The area of this study was the district of Faisalabad. A sample of 200 workers was interviewed using a simple random sampling technique. The interview schedule was used for data collection. Description of the data and statistical analysis was done through SPSS. The findings revealed that the energy crisis decreased production in the textile industry. It also affected worker's earnings and social status. Researchers suggested that the industrialists **s**hould compensate the workers by raising the wages. Industrialists **s**hould use such type of electrical machinery which can operate at low voltages and consume less electricity instead of heavy-duty machinery. Industry owners should make their powerhouse or plants. The government should implement strict rules and regulations to avoid theft and line losses and must have a transparent and justified system.

Keywords: Energy Crisis, Socio-economic Status, Industrial Production, Textile Industry

Email: farhanfaiz@qau.edu.pk

1. Introduction

The industries of Pakistan have an energy deficit. It has badly affected in all walks of life. The direct impact on the industries is seen as a significant decrease in production and discouragement of further investments in local production. The world is moving into a global village and rapid industrialization. And energy demand is increasing. Pakistan is also included in this process.

The energy crisis confronting Pakistan is a critical issue that significantly affects industrial expansion, economic progress, and public well-being. It arises from various factors, including a surge in energy demand, insufficient supply, financial mismanagement, outdated infrastructure,

and an excessive dependence on fossil fuels. This predicament has notably burdened Pakistan's industrial sector, which heavily relies on stable energy supplies for manufacturing.

1.2 Causes of the Energy Crisis

- Demand and Supply Gap:
    - Pakistan's demand for electricity has increased by approximately 6-8% each year due to population growth, urban migration, and industrial development. Nonetheless, the energy supply has not matched this demand, resulting in a substantial deficit Hussain, [1].
    - Peak demand frequently surpasses 25,000 MW, while supply fails to keep pace, leading to power outages NEPRA, [2].
- **Reliance on Imported Fuels:**
    - More than 60% of Pakistan's electricity is generated from fossil fuels, including imported oil, coal, and LNG (National Electric Power Regulatory Authority, NEPRA, [2]. Fluctuations in global market prices further worsen the crisis.
- **Circular Debt:**
    - The energy sector suffers from financial inefficiencies attributed to circular debt, which exceeded PKR 2.6 trillion by 2023 Government of Pakistan, Ministry of Energy, [3]. This debt hampers the ability of power producers to operate effectively and invest in infrastructure.
- **Inefficiencies in Transmission and Distribution:**
    - Pakistan incurs transmission and distribution losses of around 17-20% due to outdated facilities and electricity theft Asian Development Bank, [4].

1.3 Electricity Consumption by Industries in Pakistan

1. Share of Electricity Consumption

The industrial sector in Pakistan stands out as one of the foremost electricity consumers, comprising approximately 25-30% of the total electricity utilization NEPRA, [2]. Industrial electricity consumption is dominated by several key sectors:

- ***Textiles:*** As the primary contributor to exports, the textile industry is energy-intensive and relies heavily on gas and electricity. It accounts for nearly 40% of overall industrial energy consumption All Pakistan Textile Mills Association, [5].
- ***Cement and Steel:*** These sectors also consume considerable amounts of energy due to their high-temperature manufacturing processes.
- ***Fertilizers and Pharmaceuticals:*** These industries require stable electricity for their continuous operations

2. Impact of Energy Shortages on Industries

- ***Load Shedding:***
    - Regular power outages disrupt production routines, causing delays in fulfilling export commitments and raising operational expenses.
    - A report from the Pakistan Business Council (PBC) states that energy shortages have led to annual export losses exceeding $2 billion
- ***Relocation of Industries:***
    - The instability of energy supplies has driven some industries to relocate to neighboring countries such as Bangladesh, which provides more dependable energy resources
- **Objectives for the present research were to:**
    - Explore the social impacts of the energy crisis on textile workers.
    - Explore the economic impacts of the energy crisis on textile workers.
    - Investigate the impacts of the energy crisis on industrial production.
    - Scrutinize the change in productivity of workers due to the energy crisis

2. Methodology

The present research was conducted in Khurrarianwala town, district Faisalabad-Pakistan, and the target population was textile industry workers. 6 industries were selected out of 35 industries through systematic sampling and 200 respondents were selected through simple random sampling technique. The interview schedule was used for data collection, while SPSS version 24 was used for data analysis. The hypothesis was tested through a chi-square test.

3. Result and Discussion

Table No.1 Demographic information

Response	Frequency	Percent
Age		
18-24	48	24.0
25-31	56	28.0
32-38	46	23.0
39 and above	50	25.0
Total	200	100.0
Education		
Primary	20	10.0
Middle	52	26.0
Metric	128	64.0
Total	200	100.0
monthly income		
8000-10,000 rs.	17	8.5
11,000 rs. and above	183	91.5
Total	200	100.0
family type		
nuclear family	84	42.0
Joint family	98	49.0
Extended family	18	9.0
Total	200	100.0
house pattern		
Kacha	20	10.0
Pakka	56	28.0
Mixed	124	62.0
Total	200	100.0

This table shows that 24 percent of respondents answered that their age was 18-24 years, 28 percent of respondents answered that their age was 25-31 years, 23 percent of respondents

answered that their age was 32-38 years and 25 percent of respondents answered that their age was 39 and above. So, the majority (28%) of respondents' age was 25-31 years

10 percent of the respondents belonged to primary education 26 percent of respondents belonged to middle education and the majority 64 percent of respondents belonged to the metric education. The above table also illustrates that 8.5 percent of respondents' monthly income was 8,000-10,000 rs. And 91.5 percent of respondents' monthly income was 11,000 rs and above. So, the majority (91.5%) of the respondents earned 11,000 rs. or above 11,000 rs. Because the salary of textile industries is around about 11,000 rs.42.06 percent of respondents belonged to the nuclear family, 49 percent of respondents belonged to joint family and only 9 percent of respondents belonged to extended family. This statistical analysis shows that the majority of respondents belonged to the joint family because they were compelled to live in the joint family due to culture.

Table no.1 displays the respondent's house pattern. 10 percent of respondents had kacha house patterns, 28 percent of respondents had pakka house patterns and 62 percent of respondents had mixed house patterns. So, the majority of respondents belonged to mixed houses, accordance to their economic condition.

Table no.2 shows that 16.5 percent of the respondents were doing overtime and 83.5 percent of the respondents were not doing overtime. So, the majority of respondents didn't do it over time.

This table also shows that 21.2 percent of the respondents were doing overtime 1-2 hours 51.5 percent of the respondents were doing overtime 3-4 hours 27.3 percent of the respondents were doing overtime 5-6 hours. This statistical analysis shows that the majority of respondents were doing overtime work to improve their social life and also had to save some money for the bright future of their children. This table shows that 37 percent of the respondents had been working in this textile industry for 1-3 years 21 percent of the respondents had been working in this textile industry for 4-6 years and 23 percent of the respondents had been working in this textile industry since 7-9 years and 14.5 percent of the respondents had been working in this textile industry since 10-12 years and 4.5 percent of the respondents had been working in this textile industry since more than 12 years.

Table No.2

Response	Frequency	Percent
duration of working in this textile industry		
1-3	74	37.0
4-6	42	21.0
7-9	46	23.0
10-12	29	14.5
more than 12 years	9	4.5
Total	200	100.0
industry manufactured products		
Bedding	39	19.5
Carpets	24	12.0
Cotton fabrics	68	34.0
Silk	69	34.5
Total	200	100.0
over time		
Yes	33	16.5
No	167	83.5
Total	200	100.0
doing overtime many hours		
1-2	7	21.2
3-4	17	51.5
5-6	9	27.3
Total	33	100.0

The majority (34.5 %) of the respondents said that their industry produced silk and 34 percent of the respondents said that their industry produced cotton fabrics 12 percent of the respondents said that their industry produced carpets and 19.5 percent of the respondents said that their industry produced bedding. Because the silk was most profitable product. Therefore most industries produced silk.

Table No.3

Response	Frequency	Percent
energy crisis in the industry		
Yes	180	90.0
No	20	10.0
Total	200	100.0
duration of load shedding		
6-7	6	3.0
8-9	194	97.0
Total	200	100.0
facing problems due to load shedding in the production system		
To great extent	185	92.5
To some extent	12	6.0
Not at all	3	1.5
Total	200	100.0
energy crisis decreases production		
To great extent	168	84.0
To some extent	19	9.5
Not at all	13	6.5
Total	200	100.0

The above table shows that according to 90 percent of respondents, the industry faced an energy crisis and according to 10 percent of respondents, the industry did not face an energy crisis. So, the majority of respondents said that the industry faced energy crises. 3 percent of the respondents said that load shedding happened 6-7 hours in a day and 97 percent of the respondents said that load shedding happened 8-9 hours in a day. This statistical analysis shows that the majority of respondents said that load shedding happened 8-9 hours a day. The duration of load shedding was very high due to improper policies of government.

The problem due to load shedding in the production system to a great extent was 92.5 percent; to some extent was 6 percent and not at all was 1.5 percent. The majority of respondents faced problems to a great extent due to load shedding in the production system. This statistical analysis

shows that the majority of respondents said that the industry faced many problems due to the energy crisis because their production of the industry depended upon energy.

The above table shows that the ratio of respondents who were in favor of the energy crisis decreased production to a great extent was 84 percent, to some extent was 9.5 percent and not at all was 6.5 percent. The majority of respondents said that the energy crisis decreased production to a great extent due to the high rate of load shedding. The rate of production was decreased.

Table No.4

Categories	Frequency	Percent
faced problems in working activities		
To great extent	151	75.5
To some extent	43	21.5
Not at all	6	3.0
Total	200	100.0
effecting in earnings due to the energy crisis		
To great extent	157	78.5
To some extent	36	18.0
Not at all	7	3.5
Total	200	100.0
energy crisis decreased the wages		
To great extent	148	74.0
To some extent	44	22.0
Not at all	8	4.0
Total	200	100.0
The energy crisis is the cause of unemployment		
To great extent	141	70.5
To some extent	54	27.0
Not at all	5	2.5
Total	200	100.0

The above table shows that the ratio of respondents who were in favor of facing problems in working activities to a great extent was 75.5 percent, to some extent was 21.5 percent and not at

all was 3 percent. The majority of respondents faced problems in working activities to a great extent. Most of my daily activities were based on computers, the internet, and industry machinery. Where all were derived by energy such as electricity. So energy crisis disturbed the working activities. The ratio of respondents who were in favor of the energy crisis affected earning to a great extent was 78.5 percent, to some extent was 18 percent and not at all was 3.5 percent. The majority of respondents answered that the energy crisis affected earnings to a great extent. Because mostly of earning activities depended on energy and were also disturbed through load shedding.

This table shows that the ratio of respondents who were in favor of the energy crisis decreased wages to a great extent was 74 percent, to some extent was 22 percent and not at all was 4 percent. The majority of respondents said that the energy crisis decreased our wages because our industry runs based on energy and our wages depend on the duration of work.

Table no. 4 also shows that the ratio of respondents who were in favor of the energy crisis magnified the unemployment to a great extent was 70.5 percent, to some extent was 27 percent, and not at all was 2.5. The majority of respondents said that the energy crisis magnified unemployment to a great extent. Mostly all the activities of business depended on energy. Due to the energy crisis, the efficiency of industries became very low. Workers were terminated from the industry because there was no need for more labor.

This table shows that 99.5 percent of respondents faced bad behavior by supervisor and .5 percent of the respondents didn't face bad behavior by supervisor. So, the majority of respondents faced bad behavior from their supervisors.

This table shows that 75.5 percent of respondents faced abuse as a part of bad behavior by supervisor and 24.5 percent of the respondents didn't face abuse as a part of bad behavior by supervisor. The majority of respondents said that their owners gave them punishment that was mostly in the form of abuse to increase the efficiency of workers in industries. 59 percent of the respondents faced physical abuse and 41 percent of the respondents didn't face physical abuse as bad behavior by the supervisor. The majority of respondents said that they faced physical abuse as bad behavior by the supervisor. 50.5 percent of the respondents faced mental torture and percent of the respondents didn't face mental torture as a bad behavior of supervisor. So, the majority of respondents faced mental torture as a bad behavior of the supervisor.

Table No. 5

Response	Frequency	Percent
Bad behavior of the supervisor		
Yes	199	99.5
No	1	.5
Total	200	100.0
Facing abuse		
Yes	151	75.5
No	49	24.5
Total	200	100.0
Facing physical abuse		
Yes	118	59.0
No	82	41.0
Total	200	100.0
Facing mental torture		
Yes	101	50.5
No	99	49.5
Total	200	100.0
Impact on workers' industrial work		
To great extent	173	86.5
To some extent	21	10.5
Not at all	6	3.0
Total	200	100.0
Energy crisis impact on		
Jobless	43	21.5
Loss over time	12	6.0
decreasing in working shift	13	6.5
all of the above	132	66.0
Total	200	100.0

Table no.5 shows the ratio of respondents who were in favor of the energy crisis impacting their industrial work to a great extent was 86.5 percent, to some extent 10.5 percent, and not at all 3 percent. The majority of respondents said that the energy crisis impacted their industrial work to a great extent.

This table also shows that 21.5 percent of the respondents answered that the energy crisis is the cause of joblessness 6 percent of the respondents answered that the energy crisis is the cause of loss over time and 6.5 percent of the respondents answered that the energy crisis is the cause of decreasing in working shift and 66 percent of the respondents answered that energy crisis is the cause of above all mentioned categories. So, the majority of the respondents faced all types of problems which are given in this table due to the energy crisis.

This table shows that 89.5 percent of the respondents could sleep 5 to 6 hours and 10.5 percent of the respondents could sleep 7 to 8 hours. So, the majority of respondents could sleep 5 to 6 hours daily. The ratio of respondents who were in favor of improper sleep-affected working activities, to a great extent was 46 percent, to some extent was 51.5 percent, and not at all was 2.5 percent. So, the majority of respondents answered that improper sleep affected their capacity to work to some extent because of low wages and expecting more money to fulfill their needs.

The above table shows that the ratio of respondents who were in favor of improper sleep-affected on production to a great extent was 60.5 percent, to some extent was 36.5 percent and not at all was 3 percent. So, the majority of respondents said that improper sleep affected production to a great extent. The reason was that humans were not like machines, he/she needed some rest. Without rest, the capacity of the individual will be decreased.

The above table also shows that 21.5 percent of respondents watched TV in their leisure time, 16 percent of the respondents listened to radio, 18 percent of respondents played games, and 10 percent of respondents visited recreational places for entertainment. And 34.5 respondents participated in all of the entertainment activities in their leisure time. So the majority of respondents participated in watching TV, the radio, playing games, to visiting recreational places. Respondents support those recreational activities that are available and in their capacity.

Table No.6

Response	Frequency	Percent
worker's sleeping hours		
5-6 hrs.	179	89.5
7-8 hrs.	21	10.5
Total	200	100.0
affecting in working activities due to improper sleep		
To great extent	92	46.0
To some extent	103	51.5
Not at all	5	2.5
Total	200	100.0
affecting production due to improper sleep		
To great extent	121	60.5
To some extent	73	36.5
Not at all	6	3.0
Total	200	100.0
Workers' free time activities		
Watch TV	43	21.5
Listen to radio	32	16.0
playing any game	36	18.0
Visit any recreational place	20	10.0
Others	69	34.5
Total	200	100.0

- **Testing of the hypothesis**
- **Chi-square test**
- **Hypothesis**

There is an association between having energy crisis and a decreasing production system in the textile industry.

- **Null hypothesis (H_0)**

There is no association between having an energy crisis and decreasing production systems in the textile industry.

- **Alternative hypothesis (H_1)**

There is an association between having energy crisis and a decreasing production system in the textile industry.

Table No.7 Cross Tabulation between Energy Crisis and Decreasing Production in Industry

Energy crisis		decrease production			Total
		to great extend	to some extend	not at all	
Energy crisis in the industry	Yes	161	12	7	180
	No	7	7	6	20
Total		168	19	13	200

χ^2 = 40.443 DF = 2 p- Value = 0.000

This result shows that the p-value is highly significant and the alternative hypothesis is accepted. Hence, there is a high association between the energy crisis and decreasing production systems. Energy is the main source of running the production system. When it is disturbed, the whole production system will be disturbed. As a result, the production rate will be declining. So it indicates that there is a high association between energy crisis and decreasing production.

4. Conclusion

Suspension of the energy crisis creates negative impacts on industrial development. In industrial units, the process of production is slowly day by day. Owing to this, business activities are damaging. And, a system of two shifts in industries has ended. Students, machinists, laborers, and skilled workers are affected badly due to load shedding. Power looms and electronics are not out of their dangerous effects. As industry is dependent on electricity and has to perform at its full capacity only by the electricity and this core element was affected by the unplanned load balancing of the electricity which is affecting this industry along with others in a way that its growing graph is declining day by day. The present study was intended to explore the impact of the energy crisis on the socio-economic status of textile industry workers in district Faisalabad. It

also investigated the impacts of the energy crisis on industrial production and scrutinized the change in productivity of workers due to the energy crisis. It was to check the effect of the energy crisis in terms of income, working hours, wages, and behavior of workers. The findings revealed that the energy crisis decreased production in the textile industry. It affected worker's earnings and social status. Load shedding happened 8 to 9 hours daily and faced problems in the production system. The energy crisis also decreased production. At the same time, it decreased the workers' wages. This result also concluded that workers faced problems in family activities, health problems, etc. due to energy crises such as electricity crisis. The universe of the present study was the district of Faisalabad. The interview schedule was used through simple random sampling for data collection. Description of the data and statistical analysis was done through SPSS. Finally conclusion was taken from the perspective of the whole study, due to the limitations of time and sample size it was suggested that if the research is repeated should employ a bigger sample size and be given adequate time and effort that would in the more significant form.

5. Suggestions

Keeping all aspects discussed in the report finally following are suggestions to cope with the prevailing situations caused by the energy crisis:-

- The industrialists **s**hould also compensate the workers by raising the wages as it is the moral duty of the industrialists to take care of the workers in this bad condition and will improve the socio-economic conditions of the workers.
- Industrialists **s**hould use such type of electrical machinery which can operate at low voltages and consume less electricity instead of heavy-duty machinery.
- The government should try to control the electricity and should implement justified load balancing schedules.
- The administrative system of the government should be improved.
- The power production system should be improved and for this purpose, the Government should emphasize establishing more and more dams and should also consider other means of power generation like, windmills, solar, coal, etc. to fulfill the needed/desired production level.
- Proper distribution Infrastructure should be evolved for the distribution of the generated

power.

- The government should implement strict rules and regulations to avoid theft and line losses and must have a transparent and justified system to deal with the culprits.
- The General Public should be made aware of the proper usage and savings of energy so that generated power can be utilized in the required sectors like industry.

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