

# Impact of CNG Crisis on Student's Academic Life

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## Abstract

The goal of this study is to determine the impact of Compressed Natural Gas (CNG) crisis on Student's Academic Life of Karachi Pakistan. This research helps in observing the behavior of students and their educational progress includes depression and anxiety, rate of absenteeism and undesirable results in exams threatens due to CNG crisis and suggest the beneficial ways which helps to reduce the problem of CNG crisis and boosts student's academic life. This research is based on qualitative and empirical data. Inferential statistics techniques are used to determine the impact of variables include widespread use of CNG, demand and supply gap of gas, gas theft and irresponsible attitude of government on student's academic life. The collection of data is done from students, teachers, psychologist and economist through random sampling. SPSS software is used to verify the results of the study. This research is useful for educational institutions, government and psychologist as well as for the researchers who want to research in this area because this research provides clear direction towards the factors which threatens student's academic life.

**Keywords:** Depression and anxiety, Empirical data, Inferential statistics techniques

## 1. Objective

The objective assessment of this research is to analyze the impact of CNG crises on the academic life of Karachi students. The aim of this research is to investigate student's behavior in daily routine as well as their educational progress. In this research we want to explore the best dimensions through which negative impacts of CNG crises among students can be reduce.

## 2. Introduction

Energy plays an important role in everyday lives of people as well as economy of country if it is properly utilizing by everyone in all sectors. Usage of Primary energy is boosted by 150% in the period of ten years. Primary energy contains electricity, gas and fuel.

"In past ten years, demand of primary energy has extensively boosted in Pakistan. According to figures, application of primary energy upheaved by 150% as it entails essential types of energy like electricity, gas and fuel." (Aftab Ahmed, Abid Ghafoor Chaudhry, Haris Farooq and Ansa Riaz, 2013).

12 TCF (Trillion Cubic Feet) gas reserves ascertained in Sui field located in Dera Bugti of Balochistan which was the substantial deposition of that time but still country has biggest system of underground pipelines scattered over 20,000 km.

"In 1955, Natural Gas found in Sui in the area of Dera Bugti in Balochistan. The reserves were about 12 TCF (Trillion Cubic Feet), which was largest amount in the world. In present, underground gas pipelines disperse over 20,000 km in Pakistan." (Dr Farid Malik, 2015).

Usage of gas had extremely at its peak when preceding President Pervaiz Musharraf took decision of converting whole transportation system from oil to CNG to restrain money which was expend on import of oil from foreign countries.

"President of preceding government Pervaiz Musharraf foment the use of Compressed Natural Gas

(CNG) in transportation because he was determined to save the amount of money expend on import of oil from foreign countries.” (Gas Shortage Exposes Pakistan’s Energy Crisis, 2012)

Government wanted to expand CNG industry, protected the environment and boosted the economy of country by making different policies which gave many benefits to investors like freed CNG equipment from import duty and GST, encouraged import of CNG compressors, accelerate the growth of CNG stations through illimitable licenses, accredit loans for establishing CNG stations and also gave precedence for gas connections to CNG sector.

“For the betterment of economy and environment, Government expanded CNG sector by giving upper hand to investors such as allowed to import CNG compressors, freed CNG equipment from import duty and GST, distributed illimitable license for setting up CNG stations, announced to give loans and also gave importance for gas connections to CNG sector.” (Muhammad Imran Khan and Tabassum Yasmin, 2014)

Due to inappropriate policies and lack of foreknowledge, usage of CNG in transport raised up by more than 80% in Pakistan which is not matched with supply because now Pakistan has only about 2 TCF (Trillion Cubic Feet) gas reserves. There is a huge difference between production and consumption of gas as the consumption raised by 40 to 50 MMCFD (Million Meter Cubic Feet per Day) in summer and 80 to 100 MMCFD (Million Meter Cubic Feet per Day) during winter every year. Gas theft is also another reason behind low production and high consumption of gas which is about 12.5% of total output.

“All these policies are not supportable because CNG vehicles raised up by more than 80% in the Country.” (Gas Shortage Exposes Pakistan’s Energy Crisis, 2012).

“Every year 40 to 50 MMCFD consumption of gas escalated in summers and 80 to 100 MMCFD in winters.” (Ayman Ijaz, 2015).

There is also some lacking on the part of local consumers and CNG stations. CNG stations acquire gas from Government and do not pay for their purchases and local consumers use compressors to suck gas and also slow down gas meters. Due to which CNG industry face financial problems and also leads to increase in prices. As a result, Transporters demand double fares from common public including students due to which they face financial crisis in their academic life. In spite of this, there are many problems that students face in their academic life due to CNG crisis.

This investigation is throwing light on those issues that occurs in student’s academic life due to CNG crisis. Psychological problems in students are also addressed in this research.

### 3. Literature review

Mr. Aftab Ahmed, Abid Ghafoor Chaudhry, Haris Farooq and Ansa Riaz said that there are many reasons of CNG crisis but biggest one is illimitable license to CNG stations without considering the extensive usage in future and lack of new resources. Now, more than 3000 CNG stations are working & more than 1000 will be initiated in coming two years. According to Ministry of petroleum and Natural Resources, Gas production increased from 3837 to 3973 MCFD or increased by 2.6% & its use or consumption increased by 4.4% so this biggest difference in demand (consumption) and supply (production) is due to extensive use and lack of resources. Due to this extreme usage of CNG in vehicles, it affected electricity sector and also leaving its bad impact on sociable lives of peoples and also on student's life. Due to these crisis students are waiting in long lines for filling gas in vehicles, so they miss their social affairs, they do not reached to their classes on time. Due to CNG crises, the consumers restricted their outside and social activities.

Mr. Muhammad Imran and Miss Tabassum Yasmin reported that in past 10 years, Massive growth faced by CNG industry because government encouraged the use of CNG to secure environment and due to cheap prices than petrol or oil, freed CNG stations and its equipment from import duty and GST, allowed import of CNG compressors, provided soft term loans for establishment of CNG stations, provided illimitable license to many CNG stations and gave precedence to CNG sector for supplying gas. That’s how growth of CNG stations and Vehicles continuously increase.

According to Fiaz Hussain and Dr Shahzad Hussain, before announcing the policy of compressed natural gas (CNG), Pakistan having a huge amount of natural gas reserves. After introducing this policy government wants to protect environment from hazardous gases which comes from diesel and petrol because CNG is environment friendly gas. Another objective of government is to deflate import bill of oil because CNG is cheaper than oil. The current production of natural gas is 4 billion cubic feet per day (BCFD) and its demand is 8 billion cubic feet per day (BCFD). The reasons of demand and supply gap of CNG are gas reserves deficiency, non- exploration of reserves, incomplete projects, lacking of finance etc. This gap rises 40 to 50 percent in summer and 80 to 100 percent in winter due to non-seriousness of government that’s why Pakistan faced CNG crisis.

Fiaz Hussain and Dr Shahzad Hussain further said that natural gas widely used in many sectors like: i- Domestic, ii- Commercial, iii- Industry, iv- Transport and v- Power. According to “Natural Gas Allocation and Management 2005” government gives 4<sup>th</sup> priority to CNG sector because of this government not provide their

full attention towards this sector which it deserves and not properly allocated the budget that's why CNG crisis occur.

Michael Kugelman narrated that the strategies of energy not fully depend on civil officers, public servants and experts of technology whose work to develop long run and strong policies (they are specialists in their fields) instead of this, incompetent and high profile members of political groups decide the strategies because of their incompetency, less experience and inefficiency they don't make proper policies that's why CNG sector face crisis.

Ameer Nawaz Khan, Toheeda Begum and Mehwish Sher reported that in past 50 years, Pakistan had benefits from sufficient supply of gas but subsequent 2006 there was great deficit in supply of gas and demolished many sectors like domestic, commercial and industrial. Due to this government decided to cut supply of gas 2 days in a week from industries and CNG stations from Nov 2009 till March 2010.

Asif Masood said that the root cause of CNG crisis is gas has been theft in our country in excess amount. About 12.5% gas from total production has been theft. In Pakistan many CNG stations are involved in illegal use of CNG and they run without license. In present more than 200 CNG stations are involved in gas theft activity which is the big reason of CNG shortage in our country.

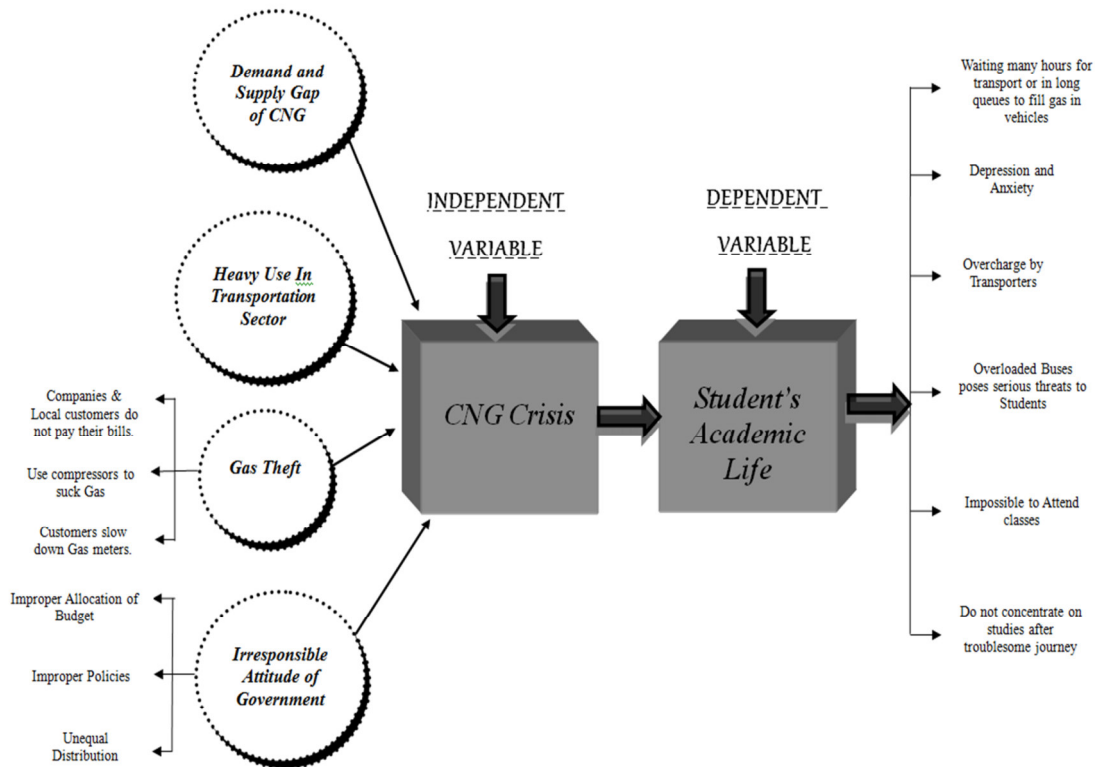
Muhammad Arsalan, Rashid Zaman and R.K Malik narrated about the impact of unannounced CNG shortage. The productivity of students are decline, due to this pitfall, work load is highly incurred and study hours are affected extremely because of this psychological issues are also increased like depression, Anxiety, Tension and stress. Females feel hesitation because of overcrowded buses by males. Passengers wait for transport many hours and due to increase prices of CNG, transporters also increase the fares.

Salman Elahi said that due to extensive use and low production of gas in winters, Government of Pakistan supply limited CNG in summers. Because of this interruption in supply of CNG, not only transporter's business destroyed but student's life also strained. They faced many problems while going to their colleges, schools and universities due to lack of transport and other staff also reached late at educational institutions.

#### **4. Theoretical Framework**

Pakistan is facing CNG crisis since many years and declared third largest CNG consumer in 2010. Due to many CNG crisis, academic life of student is threatened. The root cause of this problem is the irresponsible attitude of government because from starting till now government don't make any proper policy and without considering future needs of consumers and gas reserves, government transferred all sectors from oil to gas, encouraged import and local manufacturing of CNG buses, auto financing was easily available due to which numbers of CNG vehicles increased and led to widespread use of CNG in all over the country. This extensive use of CNG cause great damage in CNG sector as well as also affect student's academic life because we don't explore and tap other energy resources to fulfill our needs. When use of CNG became extensive demand and supply gap of gas is also increased. According to estimation of 2015, demand of gas was 8 billion cubic feet per day (BCFD) and supply was 4 billion cubic feet per day (BCFD). In winter, demand of gas increases from 80 to 100 million meter cubic feet per day (MMCFD) while supply decreases because gas starts freezing in pipelines and there is not any increments in the production of gas. Gas theft is also destroying CNG sector because many local customers use compressor to suck gas and slow down gas meters to prevent themselves from paying the bills. Because of all these major problems, CNG crisis is getting worst day by day and because of CNG crisis student's academic life is also demolished. Students wait many hours for public transport and in long lines for filling of CNG in vehicles. When prices of CNG increases, drives charge double fares from students and sometimes don't complete their routes. Due to non-availability of transport, students reach late at their educational institution and can't pay much attention in class after distressing journey because of which physiological problem arises in students. If government starts exploring other resources, make proper policies, take actions against gas theft and properly implement the policies so problems in academic life of students due to CNG crises will be reduced.

## 5. Schematic Diagram



## 6. Scope

- This analysis is associated in Southern Coastal area of Pakistan, “CNG crisis impacts on academic life” in which problems are facing by the students.
- This study can be used by government in order to make policies related to subsidies, analyses and solve all other issues in CNG sector which affects our transportation sector as well as Student’s life.
- This case-study can worthwhile for educational institutions for the analysis of performance deficiency of students and attention diversion because of hectic journey as they are standing in lines at CNG stations waiting for their turn. Truancy also increases due to waiting for many hours for transport.
- This case-history can also use by psychologist because students are waiting in long lanes and enduring intense mental pressure, anxiety, depression, unquiet condition which create problems in student’s competencies.

## 7. Significance

- This investigation is helpful to know about the effects of CNG crisis in student’s academic life.
- This investigation pinpoints the main reasons behind the dearth of performance & productiveness of students.
- This investigation is very usable to ascertain the reasons behind misbehavior & other psychological outcomes of students.
- The impact of CNG crisis on academic life of students is also very advantageous for Government. With the help of this study, Government can design & improve their policies for CNG sector.
- This investigation will be assisted for Educational Institutions and Psychologists to judge the psychogenic behavior of students.
- This investigation will be very usable for future researchers, who want to do further research on academic life and behavior of students.

## 8. Methodology

The Study of this research article is based on qualitative and empirical data in which Inferential Statistical Techniques are used. For analysis of data, the SPSS Software is used in this research in which regression test was applied on the data. For this Research, the sample is taken on the basis of Random Sampling Techniques in

which 3% to 4% sample size taken from population. Primary Data for this research is collected through Questionnaires from 52 respondents in which students, teachers, psychologists, economist, employees and CNG Stations are included.

## 9. Hypothesis

### 9.1. Government's Irresponsible Attitude

H<sub>0</sub>: There is no relationship between Government's Irresponsible Attitude and Student's Academic Life.

H<sub>A</sub>: There is a negative relationship between Government's Irresponsible Attitude and Student's Academic Life.

### 9.2. Gas Theft

H<sub>0</sub>: There is no relationship between Gas Theft and Student's Academic Life.

H<sub>A</sub>: There is a negative relationship between Gas Theft and Student's Academic Life.

### 9.3. Widespread Use of CNG

H<sub>0</sub>: There is no relationship between Widespread Use of CNG and Student's Academic Life.

H<sub>A</sub>: There is a negative relationship between Widespread Use of CNG and Student's Academic Life.

### 9.4. Demand and Supply Gap of CNG

H<sub>0</sub>: There is no relationship between Demand and Supply Gap of CNG and Student's Academic Life.

H<sub>A</sub>: There is a negative relationship between Demand and Supply Gap of CNG and Student's Academic Life.

## 10. Results

- Majority Claims of this research, H<sub>A</sub> are rejected that Government's Irresponsible Attitude towards CNG, Gas Theft and Widespread use of CNG have negative relationship with Student's Academic Life. While According to SPSS test, H<sub>0</sub> is accepted that Government's Irresponsible Attitude towards CNG, Gas Theft and Widespread use of CNG have no relationship with Student's Academic Life.
- The remaining claim H<sub>A</sub> is accepted that Demand and Supply gap of CNG has negative relationship with Student's Academic Life. Where as in SPSS, H<sub>0</sub> is rejected that Demand and Supply gap of CNG has no relationship with Student's Academic Life.

### 10.1. Government's Irresponsible Attitude

#### ANOVA Table 3:

H<sub>0</sub> Accept, because Sig Value (0.320) > α (0.05), While our claim H<sub>A</sub> is rejected that there is negative relationship between Government's Irresponsible Attitude and Student's Academic Life.

#### Coefficient Table 4:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3$$

$$Y = 2.053 - 0.191x_1 - 0.124x_2 + 0.429x_3$$

- There is inverse relationship between Student's Academic Life and Unequal Distribution of Gas.
- There is inverse relationship between Student's Academic Life and Improper Allocation of Budget.
- There is direct relationship between Student's Academic Life and Improper Policies of Government.

### 10.2. Gas Theft

#### ANOVA Table 7:

H<sub>0</sub> Accept, because Sig Value (0.218) > α (0.05). While Our Claim H<sub>A</sub> is rejected that Gas Theft and Student's Academic Life has negative relationship.

#### Coefficient Table 8:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3$$

$$Y = 2.836 + 0.137x_1 - 0.467x_2 + 0.40x_3$$

- Student's Academic Life has positive relationship with Gas Compressors and Gas Generators.
- Student's Academic Life has negative relationship with Slowing down Gas meters.
- Student's Academic Life has positive relationship with Bills do not pay properly by customers and companies.

### 10.3. Widespread Use of CNG

#### Anova Table 11:

H<sub>0</sub> Accept, because Sig Value (0.165) > α (0.05). Its mean our claim H<sub>A</sub> is rejected that there is negative relationship between Widespread Use of CNG and Student's Academic Life.

#### Coefficient Table 12:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$$

$$Y = 3.579 - 0.001x_1 - 0.185x_2 - 0.216x_3 - 0.258x_4$$

- Student's Academic Life has negative relationship with all independent variables that are, Encourage Import, Issued unlimited License, Approved Auto Loans and Exemption of Duty on Import.

#### 10.4. Demand and Supply Gap of CNG

##### Anova Table 15:

H<sub>0</sub> Reject, because Sig Value (0.015) < α (0.05). While our claim H<sub>A</sub> is accepted that there is negative relationship between Demand and Supply gap of CNG and Student's Academic Life.

##### Coefficient Table 16:

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4$$

$$Y = 2.114 + 0.534x_1 + 0.429x_2 - 0.261x_3 - 0.413x_4$$

- Attack on Gas Pipelines and Gas Freezes in pipes has positive relationship with Student's Academic Life.
- Pipelines Explosions and Incomplete Gas Projects have negative relationship with Student's Academic Life.

#### 11. Conclusion

The conclusion of results is that Irresponsible Attitude of Government, Gas Theft and Widespread use of CNG have no impact on Academic Life of Students. On the other hand, Demand and Supply gap of CNG has significant impact on Student's Academic Life due to which rate of absenteeism of students, undesirable results in exams and Depression and Anxiety in student's increases.

#### 12. Recommendations

- To improve Student's Academic Life, Government should complete major projects of CNG like Iran Pakistan Project (IP), Turkmenistan, Afghanistan, Pakistan and India Project (TAPI) and Pak Qatar Project.
- Government should resolve technical issues such as freezing of Gas in pipes in winter and pipelines explosions on timely basis so that students wouldn't suffer from CNG problems.
- Government should properly monitor those places where Gas pipelines are fitted so that attacks on Gas Pipelines will be reduced.

#### 13. Limitations

- Managers of mostly CNG pumps were not agree to provide information about their work and they were afraid to disclose their policies.
- Most of the employees were not agree to give survey because they are very busy to complete their projects.

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**Tables of Government's Irresponsible Attitude**

**Table-1 Variables Entered/Removed<sup>b</sup>**

Model	Variables Entered	Variables Removed	Method
1	improper_policies.of.govt, unequal_distribution.of.gas, improper_allocation.of.budget		Enter

a. All requested variables entered.

b. Dependent Variable: students.academic.life

**Table- 2 Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325 <sup>a</sup>	.105	.019	1.110

a. Predictors: (Constant), improper\_policies.of.govt, unequal\_distribution.of.gas, improper\_allocation.of.budget

b. Dependent Variable: students.academic.life

**Table-3 ANOVA<sup>b</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4.498	3	1.499	1.217	.320 <sup>a</sup>
Residual	38.188	31	1.232		
Total	42.686	34			

a. Predictors: (Constant), improper\_policies.of.govt, unequal\_distribution.of.gas, improper\_allocation.of.budget

b. Dependent Variable: students.academic.life

**Table-4 Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.053	.602		3.413	.002
1 unequal_distribution.of.gas	-.191	.200	-.162	-.954	.347
improper_allocation.of.budget	-.124	.256	-.090	-.483	.632
improper_policies.of.govt	.429	.255	.312	1.681	.103

a. Dependent Variable: students.academic.life

**Tables of Gas Theft**

**Table-5** Variables Entered/Removed<sup>b</sup>

Model	Variables Entered	Variables Removed	Method
1	donot.pay_bills.properly, gas_compressors.and.generators, slowing.down.gas.meters		Enter

a. All requested variables entered.  
 b. Dependent Variable: students.academic.life

**Table-6** Model Summary<sup>b</sup>

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.362 <sup>a</sup>	.131	.047	1.094

a. Predictors: (Constant), donot.pay\_bills.properly, gas\_compressors.and.generators, slowing.down.gas.meters  
 b. Dependent Variable: students.academic.life

**Table-7** ANOVA<sup>b</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	5.608	3	1.869	1.563	.218 <sup>a</sup>
Residual	37.077	31	1.196		
Total	42.686	34			

a. Predictors: (Constant), do not.pay\_bills.properly, gas\_compressors.and.generators, slowing.down.gas.meters  
 b. Dependent Variable: students.academic.life

**Table-8** Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.836	.742		3.823	.001
1 gas_compressors.and.generators	.137	.245	.098	.559	.580
slowing.down.gas.meters	-.467	.217	-.375	-2.150	.039
donot.pay_bills.properly	.040	.291	.023	.137	.892

a. Dependent Variable: students.academic.life



**Tables of Widespread Use of CNG**

**Table-9 Variables Entered/Removed<sup>b</sup>**

Model	Variables Entered	Variables Removed	Method
1	exemption.of.duty.on.import, approved_auto.loans, encourage_import, issued.unlimited_license	.	Enter

a. All requested variables entered.  
 b. Dependent Variable: students.academic.life

**Table-10 Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.435 <sup>a</sup>	.189	.081	1.074

a. Predictors: (Constant), exemption.of.duty.on.import, approved\_auto.loans, encourage\_import, issued.unlimited\_license  
 b. Dependent Variable: students.academic.life

**Table-11 ANOVA<sup>b</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	8.084	4	2.021	1.752	.165 <sup>a</sup>
Residual	34.602	30	1.153		
Total	42.686	34			

a. Predictors: (Constant), exemption.of.duty.on.import, approved\_auto.loans, encourage\_import, issued.unlimited\_license  
 b. Dependent Variable: students.academic.life

**Table-12 Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.579	.550		6.504	.000
	encourage_import	-.001	.207	-.001	-.004	.997
	issued.unlimited_license	-.185	.265	-.160	-.699	.490
	approved_auto.loans	-.216	.223	-.205	-.965	.342
	exemption.of.duty.on.import	-.258	.206	-.216	-1.249	.221

a. Dependent Variable: students.academic.life

**Tables of Demand and Supply Gap of CNG**

**Table-13 Variables Entered/Removed<sup>b</sup>**

Model	Variables Entered	Variables Removed	Method
1	incomplete.gas_projects, gas.freezes.in.pipes, pipelines_explosion, attack.on.gas.pipelines		Enter

a. All requested variables entered.

b. Dependent Variable: students.academic.life

**Table-14 Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.574 <sup>a</sup>	.330	.241	.976

a. Predictors: (Constant), incomplete.gas\_projects, gas.freezes.in.pipes, pipelines\_explosion, attack.on.gas.pipelines

b. Dependent Variable: students.academic.life

**Table-15 ANOVA<sup>b</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	14.087	4	3.522	3.694	.015 <sup>a</sup>
Residual	28.599	30	.953		
Total	42.686	34			

a. Predictors: (Constant), incomplete.gas\_projects, gas.freezes.in.pipes, pipelines\_explosion, attack.on.gas.pipelines

b. Dependent Variable: students.academic.life

**Table-16 Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.114	.685		3.087	.004
1 attack.on.gas.pipelines	.534	.244	.410	2.186	.037
gas.freezes.in.pipes	.429	.197	.387	2.180	.037
pipelines_explosion	-.261	.212	-.210	-1.232	.228
incomplete.gas_projects	-.413	.208	-.350	-1.984	.056

a. Dependent Variable: students.academic.life