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Corruption and Inefficiency in the Delivery of Public Utilities: Case Study of Electricity Services

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Abstract

The corruption in the electricity sector is spread in nearly all areas and almost in all forms including particularly grand and petty corruption. The major areas prone to petty corrupt practices in the electricity sector are the billing department and procurement section. Usually people complain to have faced troubles of overbilling, inaccurate meter reading, and getting connections. In addition to these irregularities in the procurement, leakages of financial resources, undisrupted electricity supply for influential consumers and lack of transparency are the common features of the electricity sector in all the developing countries. In this study the determinants of petty corruption in the Electricity Department in the slum areas of Karachi have been identified using the data collected from the slums dwellers. The study also highlights the weaknesses of the electricity service providers and suggests possible solutions to the issue at hand.
Keywords: Petty Corruption, Public Services and Electricity Services.

1.1 Introduction

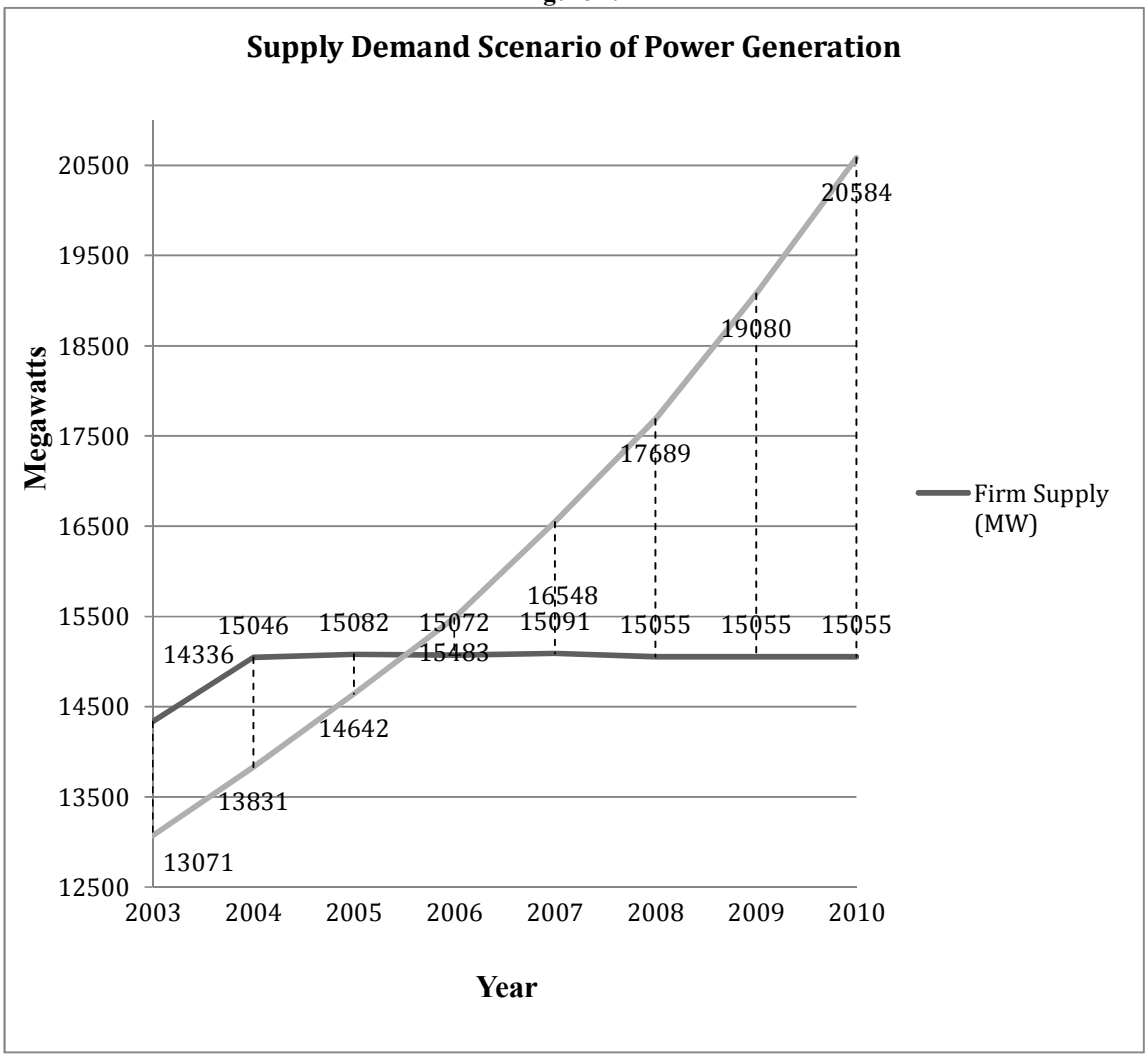
Rapid industrialization and technological advancement in recent years caused an increase in the demand for energy globally by many folds. Consistent development and growth requires an excess of energy supply over its demand. In a developing country like Pakistan, facing problems of low output growth coupled with a high population growth rate, the picture is more blurred. The gap between demand and supply of energy has been widening continuously for the last five years. To fill this gap, the government has introduced power sector reforms to meet the challenges of power sector crises. The Economic Survey of Pakistan 2011-2012 reports that: "Government of Pakistan (GOP) initiated structural reforms in the power sector under the Power Sector Reform Plan (2010) finalized by Cabinet Committee on Restructuring (CCOR). Implementation of Power Sector Reform Plan 2010 has been expedited and upgraded under the Power Sector Recovery Plan 2011. The plans are based on the following key pillars: Improved governance structure: b) Supportive legal framework c) Financial sustainability; (d) Supply side management; (e) Demand side management and f) Promote private sector participation in the sector"(pg.193).

The consumers as well as producers in Pakistan have been facing the problems electricity and gas load shedding for the last twenty-five years. In the last decade the deficiency in the supply of CNG to the CNG stations has also been added to the energy crises. In addition to this the high inflation rate due to increase in the prices of almost all products of the energy sector further exaggerated the situation. Electricity and gas are used, as the primary inputs in the industrial sector, the expansion in their demand are necessary for the Industrial expansion. Pakistan Economic Survey 2011-2012 reports that energy intensive industries reduced the real GDP growth by nearly 0.2 percentages during the years 2010-12. Lower production in the electricity has been attributed due to the liquidity problems, soaring oil prices internationally and short of water in dams, even though actual production capacity is much higher. Moreover the ninety percent of distribution network of the petroleum and gas was severely affected by the floods causing a loss of Rs.1.2 billion[1]. The share of provinces in total consumption of electricity has remained same for

[1]Asian Development Bank Report, "2011 Pakistan Floods; Preliminary Damage and Needs Assessment"

nearly last five years. The province of Punjab is consuming around sixty two percent and the province of Sind is consuming twenty percent of total electricity. The Khyber Pukhtoon Khuwa's share is eleven percent and that of Baluchistan is five percent in total consumption of electricity.

Figure 1.1



Source: Pakistan Power Infrastructure Board (PPIB)

The Electricity sector in Pakistan is a semi public vertical integrated sector. WAPDA and KESC are the major contributors in the electricity generation. The Water and Power Development Authority (WAPDA) was formed in 1958 as a Semi-Autonomous organization. The main purpose was to take care of the developmental projects of Water and Power Sectors. Later on, parts of the responsibilities of WAPDA were given to Pakistan Electric Power Company (PEPCO) in 2007. Since then WAPDA looks after projects related to Water and Hydropower sector and PEPCO takes care of matters related to thermal power. There are nine Distribution Companies (DISCOs), four Generation Companies (GENCOs) and a National Transmission Dispatch Company (NTDC), who are administratively and financially autonomous. All of them come under the PEPCO supervision. In Karachi, KESC

produces and supply electricity. The details of the market structure are presented in the appendix. The difference in the demand and supply of electricity generation can be seen in the figure 1.1. Before 2005 power generation was in excess of the demand, however after 2005 the gap between supply and demand of power has been persistently increasing and turning in to a major power shortage in the coming years. Hence it has become necessary to identify the corrupt practices that exist in the power generation, procurement and distribution system. In this study we are going to analyze the prevalence of only petty corruption that exists in the service delivery of the Karachi Electric Supply Corporation.

This study is composed as follows: Section 1.2 presents the introduction discussing the details of energy sector existing in Pakistan and particularly in Sindh. The section 1.3 gives analysis of literature relevant to the topic. Section 1.4 presents the data and econometric methodology. Section 1.5 provides the detailed analysis of data characteristics and followed by the evaluation of empirical results. Conclusion is presented in the last section.

1.2 Review of Literature

World Banks report on energy reports that "In recent years the fight against corruption has assumed a key place in development policy, as a way of strengthening economic growth and helping civil society and democracy to function. Corruption not only stifles growth, it also perpetuates or deepens inequality, as the few amass power and wealth at the expense of the many. The energy sector lends itself to corrupt practices. This is a result both of its traditional institutional arrangements dominated by state monopolies controlling oil, gas, or electricity and of the sheer amount of cash it can generate. Corruption in energy takes many forms, from petty corruption in meter reading and billing to grand corruption in the allocation of lucrative monopolies. These practices differ in scale but contribute to the same results weak operational and financial performance and, for the poor in particular, declining service quality or reduced chances of ever accessing network services. The answer to corruption is continuing reform, to reduce the incentive and potential to capture monopoly rents and to increase the transparency of public and private transactions, regulatory structures, and decision making processes"[2]. The report also shed light on the power sector of Bangladesh. The fifty percent loss to the Bangladesh Power Development Board (BPDB) and Dhaka Electricity Supply Authority (DESA) is owing to the existence of petty corruption in meter related issues costing nearly US$100 due to the this petty corruption.

Another study conducted by World Bank suggests, "Electricity providers fail to serve citizens for many reasons. The ultimate cause is poor governance at the utility sector, and government levels. Corruption is among the serious symptoms of poor governance corrosive in its effects, causing more harm in waste and bad decisions than even the money that changes hands as bribes and kickbacks would suggest"[3]. Gulati, M. and M.Y. Rao (2007) argues that the existence of corruption in the electricity sector can be seen in all operations including generation, transmission, and distribution. The study identifies the detail of corrupt activities in the electricity sector presented in the table 1.1.

The research on the corruption in the power sector in Pakistan (Lovell. and A.V McKechnie 2000) shows that under the management of army significant reduction in the electricity theft cases were observed in 1999.These cases include numerous prohibited connections (used by poor as well as rich households, industrialist and other commercial projects)[4].

The separate study by Muhammad Saleem (2005)[5] provides assessment of the electricity sector of Pakistan on the basis of technical efficiency. The data of twelve private and nine public electricity-producing firms was used to examine the technical efficiency of these plants during 1998-2003. The results from the Stochastic Frontier Analysis

[2] The Energy and Development Report 2000, Energy Services for the World poor, The World Bank Group, Private Sector and Infrastructure Network, Washington, D.C.
[3] Deterring Corruption and Improving Governance in the Electricity Sector Energy, Transport & Water Department and Finance, Economics & Urban Department. World Bank.
[4] Chapter 8, the Cost of Corruption for the Poor. Ibid.
[5] Available at http://ebookbrowse.com/technical-efficiency-in-electricity-generation-sector-of-pakistan-the-impact-of-private-and-public-ownership-pdf-d232268480

(SFA) and Data Envelopment Analysis (DEA) illustrate that the performance of the private plants is better than that of public plants. The author suggests that in the production of electricity, it is better to consider private firms as benchmark.

Table 1.1
Vulnerability to Corruption Theft of Electricity

Activities	Mode of Theft	Beneficiaries of Corruption
Generation	Theft of fuel camouflaged as auxiliary consumption in thermal generation plant Unauthorized use in the homes of generation plant staff	Staff of the generation plant & Labor union leaders
Transmission	Tapping of overhead transmission lines by large consumers Defective meters	Large consumers
		Politicians, Bureaucrats, Utility managers, Transmission line staff
Distribution	Tapping of distribution lines	Consumers, Distribution utility staff
	Unauthorized supply of energy	Consumers, Utility managers, Distribution utility staff
	Organized resistance to paying for electricity	Labor union leaders, Politicians, Groups of consumers acting in concert (farmers, industries, residential areas, and the like), Local mafia with political protection
	Non billing and under billing of energy	Consumers & Billing staff
	Tampering with or bypassing meters	Consumers & Linemen
	Billing the consumer at a lower rate	Consumers, Billing staff & Utility Managers

Source: Gulati, M. and M.Y. Rao (2007).

The present paper is an attempt to bridge the gap in existing literature on the urban slums in the developing countries. To the best of my understanding this is the first corruption survey covering services of Karachi Electric Supply Corporation in the slum areas of Karachi. In this survey, the main objective is to study the perception of the poor people regarding their personal experience of corruption on interaction with the officials in the Electricity Department.

1.3 Data & Research Methodology

The present study is an attempt to discover the salient features of the service delivery mechanism of the Karachi Electric Supply Corporation in the slum areas of Karachi. For this purpose a questionnaire-based survey has been conducted in the slum areas of Karachi. It covers the sample representing the Katchi Abadies from the five districts. To the best of my knowledge this is the first corruption survey covering the slum areas. This survey only focuses the perception of the poor people regarding their personal experience of corruption on interaction with the officials in the Electricity Department.

The main objective of this study to highlight the determinants of petty corruption in provision of the services provided by the Electricity Department particularly with reference to the slum areas of Karachi. In addition to this, level at which the corrupt practices exists and the mechanism through which the bribes are demanded in the Electricity Department have also been identified in this analysis. For this purpose, the following form of the relationship between corruption and the explanatory variables for corruption is used.

$$Ln\ (EBribe) = \varphi_1\ Dkcent + \varphi_2\ Dkeast + \varphi_3\ Dkmlir + \varphi_4\ Dksout + \varphi_5\ Dkwest + \varphi 6Dmat + \varphi_7\ Dint + \varphi_8\ Dgrad + \varphi_9\ Djrstf +$$

$$\varphi_{10}\, Dsrstf + \varphi_{11} Dselown + \varphi_{12}\, Dfeml + \varphi_{13}\, Dhigh + \varphi_{14}\, wmem + \varphi_{15}\, Dplotsize + e_i \quad (1.1)$$

Where EBribe is a measure of corruption, which is equal to the amount of bribe paid by the respondent to obtain the services of the Electricity Department. Here corruption is defined as irregular payments (bribes) made by the respondents to the officials in the Electricity Department. The greater the amount paid, the greater is the corruption and vice versa. Here Dkcent represents the Central District, Dkeast is the East District, Dkmlir represents the Malir District, Dksout represents the South District and Dkwest is the West District. The level of education is regarded as one of the major causes of corruption in the literature. In view of the education system in Pakistan, only three levels of education are considered here; the matriculate, intermediate and graduate level. These are identified by the variables Dmat, Dint and Dgrad in above equation. To identify the officials involved in the corrupt practices two dummy variables are used here. The entire staff at the Electricity Department is divided in to two main groups the high grade officials and the low grade officials. The former case includes all the officers whereas later case includes all the clerical staff and other lower staff present at the Electricity station. The junior staff is represented by the dummy variable Djrstf. All the high-grade officials are represented by the dummy variable Dsrstf. The reasons for corruption in the Electricity Department as perceived by the respondents are categorized into five main groups. To incorporate the impact of wealth of the respondents in the payments of bribes to the Electricity officers the dummy for the ownership of the house has been used. The Dselown represents it. Dfeml has been used for the female head of the family. The dummy Dhigh is equal to one if the respondent has relatively high income and woman is the quantitative variable measuring the total working family members. The procedure of OLS that is ordinary least square is used to estimate the equation above for the cross-section data covering twenty-five Katchi Abadies of Karachi from the five districts. Here semi log regressions are used to estimate equation 1.1. All the explanatory variables are qualitative as well as quantitative in nature, however corruption being the continuous variable is been expressed in logarithmic form.

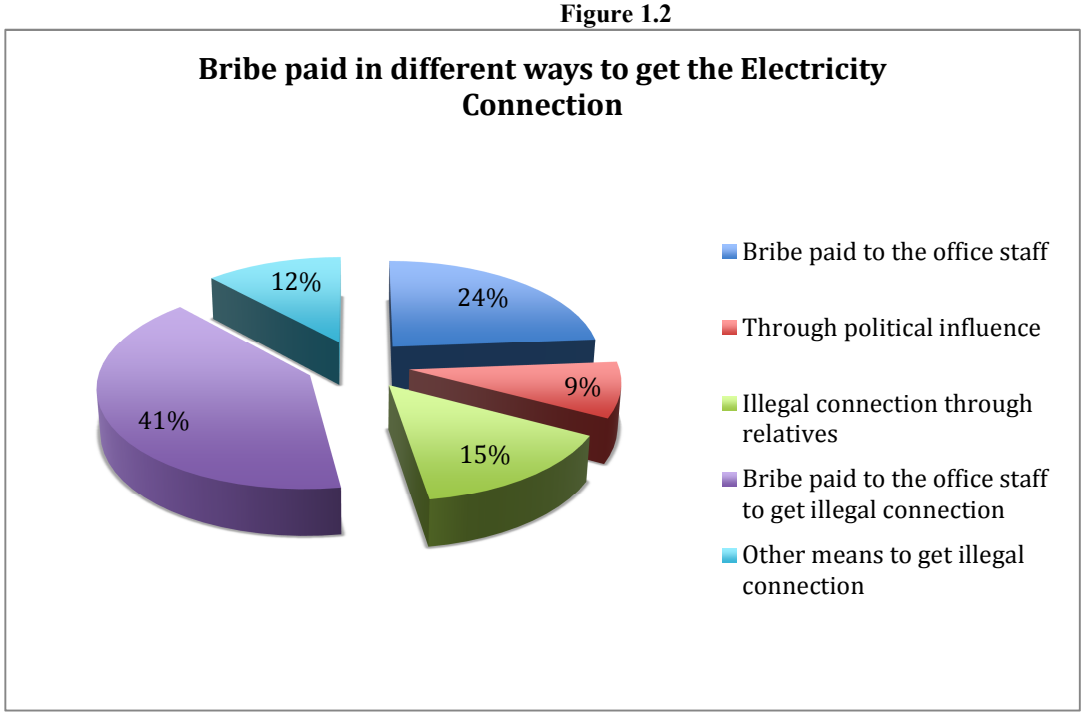
1.4 Corruption in the Electricity Department

471 respondents out of the total 485 have electricity connection to their houses. Respondents assert that they have to face corruption not only to get the electricity connection but also afterwards. It is important here to highlight the fact that people in these slum areas can get even illegal connection of electricity as well provided that they can pay for it. Only 8.5per cent persons of these 471 respondents claimed that they got the electricity connection through illegal process.

1.4.1 Different Ways to Get the Electricity Connection

Respondents claim that they either had to pay the bribe to the office staff (in 24per cent cases) or through political influence (7.5per cent) please see figure 1.2. Some of them even got illegal electricity through influential relatives (in 15per cent cases). However 12.0per cent respondents have used other means to get electricity connection. The figure 1.1 illustrates the fact that in the KESC the largest percentage share in bribe is of the office staffs that give illegal connections to the people in the slum areas.

Figure 1.2



1.4.2 Corruption Faced after getting the Electricity Connection

One hundred and seventy eight respondents of the total 471 respondents who have electricity connection claim to have faced corruption after getting the connection. These people have to interact to the Electricity Department after getting connection for different purposes details are presented in the table 1.3. 35.4per cent respondents of these178 have paid bribe to receive proper electric supply. 31.5per cent respondents have paid bribe for reducing electricity bill. 2.2per cent respondents bribed the officers to stop the disconnection of the line due to default bill. 9.6per cent respondents paid bribe for other different purposes. 11.8per cent and 7.9per cent respondents paid bribe for correcting the overbilling and illegal electricity connection respectively.

Table 1.2
Corruption Faced after getting the Electricity Connection

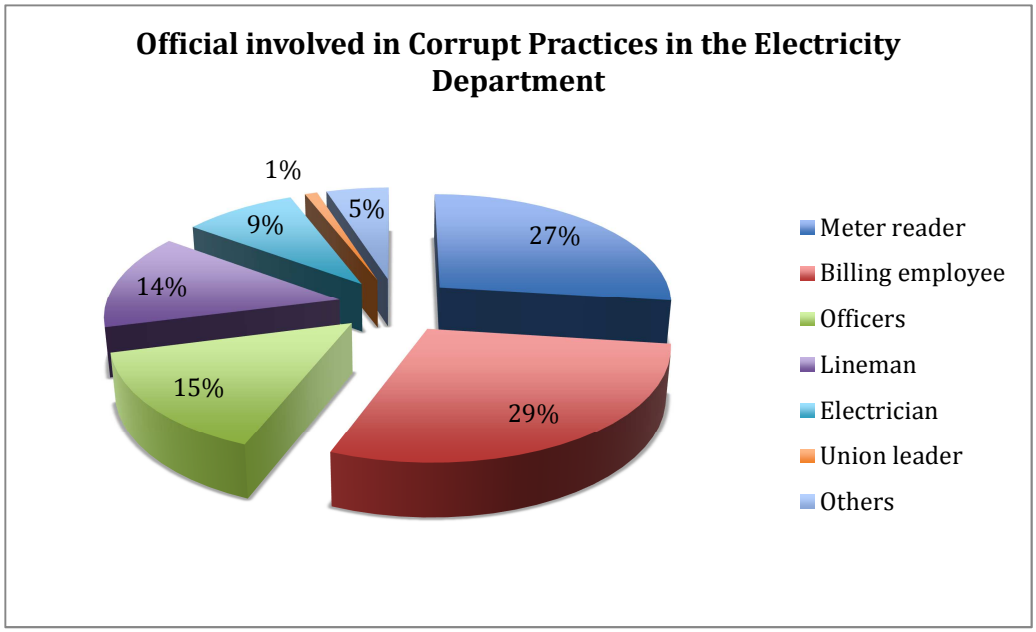
Type of Corruption	Percentage of respondents
Bribe paid to receive proper electric supply	35.40%
Bribe paid for reducing electricity bill	31.50%
Bribe paid for correcting the overbilling	11.80%
Bribe paid to stop the disconnection of the line due to default bill	2.20%
Bribe paid for other different purposes	9.60%

Source: Author's own calculations based on the survey of Katchi Abadies of Karachi

1.4.3 Officials Involved In Corrupt Practices in the Electricity Department

Overall most of the respondents have paid bribe either to receive proper electricity supply or for reducing the electricity bill. The main corrupt officials in the Electricity Department seem to be the billing employee as twenty nine percent respondents have paid bribe to them. Meter readers have received extra money in almost twenty seven percent cases for details see figure 1.3. In most of these cases the actor directly demands the bribe but in some cases the service recipients also offered the bribe to get their work done.

Figure 1.3



1.4.4 Bribe Demanded in the Electricity Department

Table 1.3 presents in detail the process through which the officials of the Electricity Department demand the bribes. Sixty eight percent respondents said that the officials openly demanded bribe when they visited the Karachi Electricity Supply Corporation for getting their problems solved. This is one of the most striking outcomes of the existence of lack of accountability in the system. In this absence of the effective accountability mechanism public officials are directly involved in corrupt practices without the fear of being caught. In fifteen percent cases, the concerned Electricity officer through some other person demanded bribe indirectly. Nearly in seven percent respondents offered bribed to the officers to get their problem solved and to save time.

Table 1.3
Demand of Bribe in the Electricity Department

Bribe demanded by	Percentage of respondents
Bribe demanded directly by the concerned officers	68%
Bribe demanded by the concerned officers indirectly	15%
Bribe offered directly by the service recipient	7%
Bribe offered indirectly	5%
Any other	5%

Source: Author's own calculations based on the survey of Katchi Abadies of Karachi

1.4.5 Bribe Paid To the Officials in Electricity Department

Moreover, in all of these one hundred and seventy five cases who paid bribe to the officials in the Electricity Department it is estimated that nearly one hundred forty five thousand, nine hundred and thirty rupees were involved (refer table 1.4). In sixty-three cases respondents claim to have paid around thirty one thousand three hundred and thirty rupees in bribe just to receive proper electric supply. Similarly in fifty-six cases almost forty one thousand and four hundred rupees were paid for reducing electricity bill. In twenty-one cases respondents claim to have paid around ten thousand four hundred and fifty rupees in bribe just to for correcting the overbilling. It should be noted here that overbilling is a very common phenomena not only in the slim areas but also in the urban areas. Unfortunately in the poor slums, as people are not aware of the procedures involve to get their bills corrected hence they prefer to bribe.

Table 1.4
Bribe Paid to the Officials in the Electricity Department

Money paid to the officials in Electricity Department	Total amount of bribe in rupees
Bribe paid to receive proper electric supply	31330
Bribe paid for reducing electricity bill	41400
Bribe paid for correcting the overbilling	10450
Bribe paid to stop the disconnection of the line due to default bill	2700
Bribe paid for other different purposes	50650
Bribe paid for illegal connection	9400
Total	145930

Source: Author's own calculations based on the survey of Katchi Abadies of Karachi

It is interesting to note here that according to the Karachi electric supply corporation people who do not pay their electricity bills within the due date their connection is temporarily disconnected. But here four out of one hundred and seventy six respondents claim that they have paid twenty seven hundred rupees in bribe to the officials of Karachi electric supply corporation to stop the disconnection. Mostly these are the cases in which the original amount of the bill is very high which the poor respondents cannot afford to pay within the due date. This is generally the case of overbilling that the people can pursue properly because of the lack of knowledge.

1.4.6 Reasons for Corruption in the Department Of Electricity

46.6per cent respondents are of the view that lack accountability is the main cause of corruption in the Electricity Department. 35.4per cent respondents think that low salaries are the main cause of corruption. 24.7per cent respondents are feel that monopoly power is the main cause of corruption. 23.6per cent respondents are of the view that lack of transparency causes corruption in the electricity office. 3.4per cent people say power of the influential people and 16.9per cent feels that discretionary power is the main reason of corruption. Lengthy and difficult procedure (10.11percent of respondents) and shortages (10.7percent respondents) are among other cause of corruption. Please see table 1.5. The overwhelming majority considers lack of accountability of public officials and the low salaries are the major causes of the corrupt practices of the officials in the Karachi Electric Supply Corporation.

Table 1.5
Reason for Corruption in the Electricity Department

No.	Reason	Percentage
1	Lack of accountability is responsible for corruption	46.60%
2	Lack of transparency is responsible for corruption	23.60%
3	Discretionary power is responsible for corruption	16.90%
4	Monopoly power is responsible for corruption	24.70%
5	Low salaries is responsible for corruption	35.40%
6	Power of influential people is responsible for corruption	3.40%
7	Lengthy and difficult procedure is responsible for corruption	10.11%
8	Shortages	10.70%
9	Other factors is responsible for corruption	2.80%

Author's Source own calculations based on the survey of Katchi Abadies of Karachi

1.5 Empirical Results for the Electricity Department

This section discusses the econometric results of the study. The relationship between various determinants of corruption in the Electricity Department has been determined by applying the multiple regression method. The electricity is the basic utility in this modern world of technology and its provision to the masses the responsibility of the government. The model in the table 1.6 provides the details information on the factors contributing to the bribe payments by the users in slum areas to the officials of Karachi Electric Supply Corporation. The low value of co-efficient of determination may be because the regression model do not control for the other factors (both quantitative and qualitative) of the corruption. According to Gujarati Damodar N. (2004) "the researcher should be more concerned about the logical or theoretical relevance of the explanatory variables to the dependent variable and their statistical significance"(pg.222). Also, the regression models do not report the exogeneity or reverse causality of corruption[6].

The coefficients of all the five districts are significant and positively related to the incidence of corruption in Electricity Department. However, the people living in the district West are more exposed to corruption as compared to the other districts. Household whose heads have secondary school certificate or the higher secondary school certificate have no effect on corruption in the Electricity Department. The coefficient of households with female head is insignificant. The households with average family income of sixteen thousand rupees or more are paying bribes to the officials of the Electricity Department. Hence it can be concluded that people who are able to pay extra money for using electricity are most likely to bribe. This model also provides insight to the fact that wealth of family as measured by the size and ownership of house is an important significant variable positively contributing bribes. Households having their own houses also like to have electricity in their houses and thus are paying more bribes for using it. In addition to this it should also be noted that in the Karachi Electric supply corporation the high-ranking officials are actively involved in corrupt activities. Evaluating the incidence of bribe payment by the service recipients of the services provided by the Electricity, health and the Electricity Departments in general supports the results drawn from the overall model presented in the table.

[6] See Gupta, S. et al (2000) for the detail explanation of low coefficient of determination and application of regression in the analysis of social variables.

Table 1.6
The Regression Model for Corruption in the Electricity Department
Interaction between the corruption and explanatory variables: Dependent variable shows the bribe paid by the respondents to the electricity officials in the slum areas of Karachi.

Variable	Coefficient	t-Statistic	Prob.
Female Head	-0.242	-0.821	0.413
High Income	0.491***	2.491	0.014
Graduate	0.062	0.294	0.769
Intermediate	-0.008	-0.042	0.966
Matriculate	-0.122	-0.747	0.456
Junior Staff	0.025	0.153	0.879
Senior Staff	0.386**	2.271	0.025
District Central	5.113***	5.939	0
District East	5.840***	7.352	0
District Malir	5.689***	7.079	0
District South	5.561***	6.843	0
District West	6.116***	7.570	0
Own House	0.253***	1.784	0.016
LOG (Plot Size)	0.050**	0.287	0.058
Working Family Member	0.048	0.882	0.379
R-squared	0.264		
Adjusted R-squared	0.190		

Note: The included number of observations = 166
* Significant at the 10% level
** Significant at the 5% level
*** Significant at the 1% level

1.6 Conclusion

The comparative analysis of the data and the regression analysis for the determination of petty corruption in the service delivery of Karachi Electric Supply Corporation suggest that there are identifiable inefficiencies in the services provided to the users of electricity in the slum areas of Karachi. The malice of petty corruption is spread in all the all districts of Karachi. The education of the respondents has no impact on their vulnerability may be the knowledge of reporting the corrupt practices can help. Claim by users for the proper service delivery is significant for pressurizing the officials in the Electricity Department to provide good electricity services. However, residents of these Katchi Abadies require information on how to make demands effectively to persuade the government as well as providers. For this both print and digital media can be effectively used to create awareness and spreading information to the masses. As majority of the people residing in these areas belong to the lower income group with lack of education. NGOs and Civil Society can also play important role in order to meet Electricity Supply Challenges. In the presence of strong political will monitoring units can established to ensure transparency and accountability in the service delivery to the users in these Katchi Abadies.

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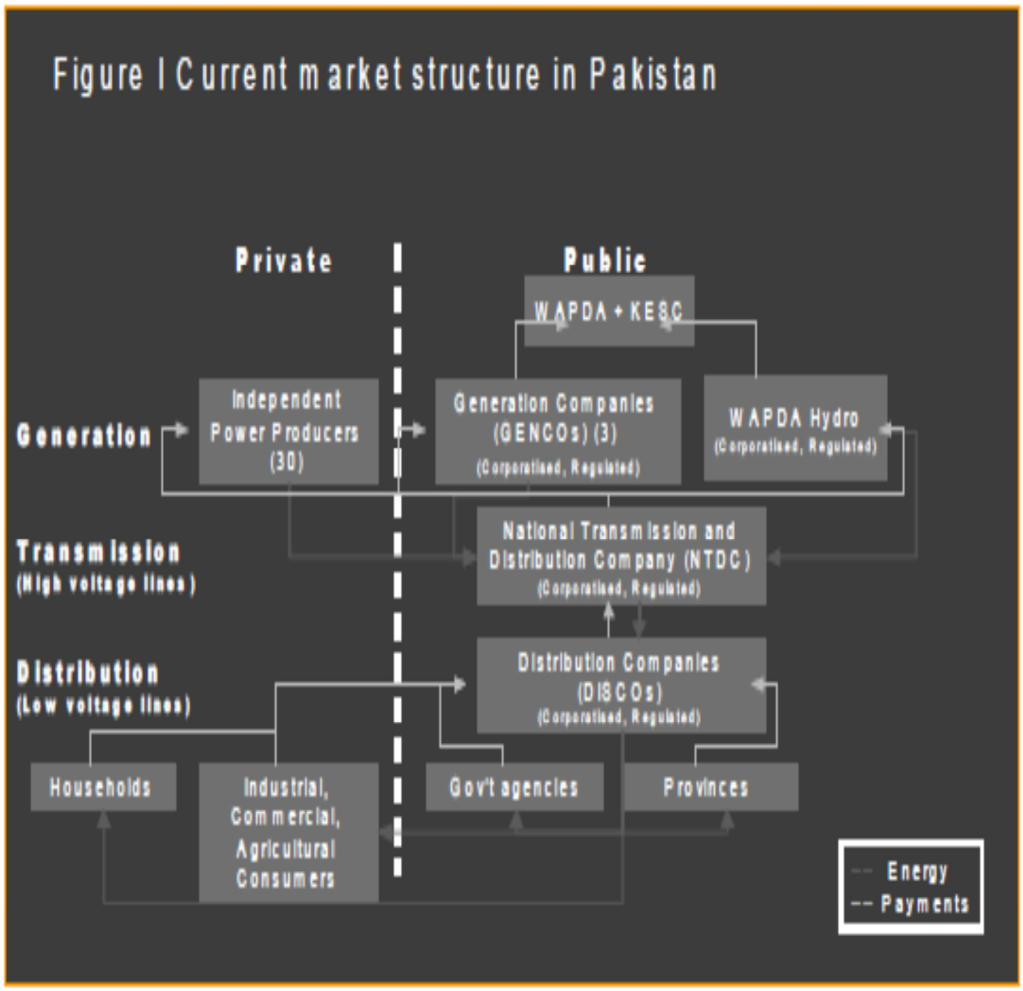
Appendix



Source: Muhammad Saleem (2005) Technical Efficiency in Electricity Generation Sector of Pakistan - The impact of Private and Public Ownership.