Jordan Journal of Civil Engineering, Volume **15**, No. **4**, **2021**

Effects of Corruption on Public Infrastructure Projects in Developing Countries: The Case of Pakistan

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ABSTRACT

Construction projects are capital -and labour- intensive with complex financial profiles. Due to this inherent complexity, construction projects are adversely affected by corruption, especially in underdeveloped countries. To emphasize the seriousness of the issue and to eradicate corruption in construction projects, a comprehensive understanding of the effects of corruption is needed. Therefore, the current study examined the impacts of corruption on public infrastructure projects (PIPs) in the corrupt context of a developing country. 27 impacts of corruption were identified through an extensive literature review and expert interviews. To rank these factors, a structured questionnaire survey was carried out to collect empirical data from different contractual parties working in various construction projects in Pakistan. The results demonstrated that corruption is widespread in the local construction industry and has harmful impacts on projects and society in the forms of the creation of monopoly, increased procurement and maintenance costs and lower-quality products. The results also revealed that the construction community believes that corruption is beneficial in that it reduces time delays and can motivate workers. The findings of the study contribute to an in-depth understanding of the consequences of corruption in public infrastructure projects. This information would be useful for project personnel, stakeholders and engineering society to enhance awareness among the parties for eradication of corruption in construction.

KEYWORDS: Corruption, Pakistan, Public infrastructure, Corruption in construction, Construction management.

INTRODUCTION

Construction projects are intricate and complex in nature and consist of diverse stakeholders with varying degrees of knowledge and experience (Enshassi et al., 2018; Gunduz and Önder, 2013; Maqsoom et al., 2019). Construction is a financially intense sector, representing a worth of around US$3,200 billion per year (Sohail and Cavill, 2008). Corruption occurs almost in every construction project, both in developing and developed countries, which severely deteriorates the positive image of the industry (Le et al., 2014a; Liu et al., 2016; Zou, 2006). American Society of Civil Engineers claims that corruption accounts for an estimated $340 billion of worldwide construction cost each year (Sohail and Cavill, 2008). Similarly, according to the indexing of Transparency International, construction is one of the most corrupt industries among the various economic sectors (Kingsford Owusu and Chan, 2018; Le et al., 2014b).

'Corruption' is derived from the Latin word 'corruptus', which means broken or damaged (Hogdson and Jiang, 2007). Various definitions of corruption exist in literature which vary according to different industries, cultures and norms (Jain, 2001). According to Le et al. (2014a), corruption is a behaviour that sacrifices the norms or principles for the interest of agents. The construction sector defined it as the misuse of authority at the cost of the construction project for personal gains or benefits (Hosseini et al., 2019; Le et al., 2014a; Owusu et al., 2017; Sohail and Cavill, 2008). Those who

Received on 28/10/2020.
Accepted for Publication on 17/6/2021.

were supposed to be the guardians of tax payers' money were discovered to be involved in financial loopholes and all kinds of immoral activities (Chan and Owusu, 2017). It is an intricate social phenomenon and the motivation to engage in corrupt behaviour is multifaceted and is the result of interactions at the micro- meso- and macro- levels (Dimant and Tosato, 2018). Discretionary power, economic rents and weak institutions are the main factors that favour corruption (Aidt, 2003; Locatelli et al., 2017). Corruption deteriorates the image of the country and damages public trust (Ika et al., 2012). Corruption can be divided into various types. Transparency International (2015) divided corruption into the following categories.

- Petty corruption: routine misuse of delegated power by mid -and low-level executives with common citizens.
- Grand corruption: Corrupt actions committed by pertinent authorities, such as provincial governments and courts.

Corruption can also be categorized as:

- Sporadic corruption: related to random opportunity.
- Systemic corruption: a vital aspect of the economic, political and social systems.

Public Infrastructure Projects (PIPs) are most vulnerable to corruption owing to the great amount of capital involved, which triggers a surge in corruption risks in construction project management (Kingsford Owusu and Chan, 2018; Le et al., 2014b). PIPs form the backbone of every economy and are critical to the survival and livelihood of humanity, ranging from all kinds of structures (hospitals, roads, dams,… etc.) to access potable drinking water (Tabish and Jha, 2011). When budgets allocated to procure these needs of humanity are misappropriated, the net result is a socio-economic setback (Owusu et al., 2019). This has hostile effects at various levels and leads to poor performance in terms of quality nonconformance, resource underutilization, schedule and cost overruns (Azhar et al., 2008; Bowen et al., 2015; Hamma-Adama et al., 2020; Ofori, 2015; Shan, Chan, Le, Xia et al., 2015). Therefore, it is a serious concern for all the growing economies to eradicate corruption from public infrastructure projects (Locatelli et al., 2017). Various studies exist on the eradication of corruption at a macro-level through various corruption-free indicators, professional standards, transparency, fairness of punishment, procedural compliance and contractual compliance (Akbar and Vujić, 2014; Kyriacou et al., 2015; Vee and Skitmore, 2003). But, all of these policy and culture changes need decades for proper implementation; however, projects need to be constantly planned and delivered (Locatelli et al., 2017). From the inception and conception phase of a project through the project closeout and defect liability period, various types of corrupt practices, such as solicitation, bribery and clientelism exist (Shakantu, 2006). As a result, the architecture and engineering management community needs to sermon the issue of corruption within the project domain; i.e., at the micro-level.

A lot of literature is available on corruption, but it is still a less explored area in project management journals (Locatelli et al., 2017). Despite the high relevance to the built environment, researching corruption is crucial due to the sensitivity of the issue and it is also challenging to point out corruption, since authorities designated for public accountancy are sometimes unable to identify the corruption (Dimant and Tosato, 2018). Locatelli et al. (2017) stated that corruption appears to be a 'taboo' in the project management community and researchers seem scared to research on this topic. They termed corruption in project management as "an elephant in the room". However, a recent upsurge has been seen in researching this topic in construction engineering and management (CEM), yet the context of these studies is still diverse and wide (Chan and Owusu, 2017; Owusu et al., 2019; Owusu et al., 2017).

In the context of corruption-related studies in construction, Le et al. (2014a) investigated the causal link between causes and vulnerability to corruption in Chinese public sector projects and found a positive correlation between the both. Bowen et al. (2015) analyzed the impact of corruption on the South African construction industry. They stated that government officials (as clients), main and sub-contractors are alleged to be the most tangled in corrupt practices. They further elaborated that bid evaluation is the most affected stage in the construction project. Ling et al. (2014) undertook a comparative analysis of drivers and barriers to adopting relational contracting practices in public construction projects in two different markets: Sydney and Beijing. The authors underlined that this type of contract may lead to allegations of corruption.

Scott (2005) indicated corruption, inadequate

sources of funding and price variation as a major factor that lead projects to failure in Nigeria. Tabish and Jha (2012) stated that countries with high corruption spend comparatively a smaller amount on operations and maintenance and have poor-quality infrastructure. Similarly, a survey of construction industry ethical practices in the USA by Doran (2004) found that 84% of the responding building owners, architects, building service firms, construction managers, contractors and sub-contractors had been exposed to construction industry-related acts or transactions that they would consider unethical.

Baldi et al. (2016) stated that complex projects are more susceptible to corruption, because the majority of complex projects are awarded by negotiation method. Shan, Chan, Le, Xia et al. (2015) developed a fuzzy model for the measurement of corruption in construction projects. Kingsford Owusu and Chan (2018) studied the barriers that obstruct the effectiveness of anti-corruption measures (ACMs). Baring the background and taking inspiration from previous studies, the current research aims to find out the negative and positive impacts of corruption on PIPs.

Pakistan is an emerging country that has recently witnessed a strong uplift in development projects and has attracted a lot of foreign investments, including the China Pakistan Economic Corridor (CPEC) (Abdullah et al., 2021; Ali et al., 2020; Hussain et al., 2016; Zahoor et al., 2015). Construction is among the major businesses making 2.3% contribution to the gross domestic product (GDP) of Pakistan (Arshad et al., 2017; Mohamed et al., 2009; Sami Ur Rehman et al., 2020; Ullah et al., 2017). For this reason, a rise in the construction industry labour force from 7.3% in 2014 to 7.6% of the total labour force in 2017 has been seen (Government of Pakistan, 2017). But Pakistan is ranked among the most corrupt countries in the world. According to Corruption Perception Index 2018 developed by Transparency International (2018), Pakistan is ranked 117 out of 180 countries with a score of 33, where 100 indicates the least corrupt. Another index related to corruption developed by the World Bank which is 'Dealing with Construction Permits' also indicated a similar result, where Pakistan is ranked 166 with a score of 53.99 (100 means the best). Corruption in Pakistan is embedded in the system to such an extent that unprofessional conduct by government executives is not reported by most observers (Quah and Khan, 2016). Likewise, some recent incidents in Pakistan and investigation carried out by the National Accountability Bureau (NAB) disclosed various mega-corruption scandals in public infrastructure projects. This led to a nationwide awareness campaign against corruption made by the Government of Pakistan (National Accountability Bureau, 2019). Therefore, it can be concluded that PIPs in Pakistan are highly vulnerable to corruption and it would be interesting to study the impact of corrupt practices on project constraints if carried out in a corrupt context like Pakistan. This will help identify the main problems and will also assist the stakeholders in policy making in the future.

The majority of the previous studies were focused on the causes, culture, socio-political response strategies and project characteristics that trigger corruption in project management (Shan, Chan, Le and Hu, 2015). No particular study has systematically categorized the ill impacts of corruption in construction projects. Given this background, the following main research questions (RQ) can be framed.

RQ1: Does corruption widespread in the Pakistani construction industry?

RQ2: What will happen to the infrastructure project performance if it is executed in a corrupt culture?

Therefore, the current study aims to investigate how corruption can influence PIPs, especially from the construction management point of view. This aim will be achieved through the following objectives:1) To develop an inventory of the impacts of corruption on PIPs and 2). To rank the most important factors according to the relative importance index. This study is the first of its nature in the context of local construction industry. The findings will not only unveil the adverse impacts of corruption to project stakeholders, but will also encourage the mission of 'corruption-free construction'.

RESEARCH METHODOLOGY

The main aim of this research is to identify and rank the consequences of corruption in public infrastructure projects. Therefore, research was conducted in two distinct stages:1). Design of instrument and 2)

Questionnaire survey. A similar methodology was also adopted by Offei et al. (2019).

STAGE 1: DESIGN OF INSTRUMENT

A comprehensive literature review was conducted for this purpose. It helped in understanding the basis of corruption and its interaction with project constraints as well as in the identification of different negative and positive effects of corruption. Literature review helped in identifying 24 corruption impacts on construction projects. To verify and validate the literature findings before conducting a comprehensive questionnaire, semi-structured interviews with 5 experts were conducted. After explaining the background of the study, the participants were informed about the identified factors from different studies. Afterwards, they were asked to scrutinize these factors in terms of the construction project and based on their experience, give suggestions if they found any missing information or relevant factors. The ranking was not done at this stage. The interviewees were from different contractual parties having vast experience in construction projects. 3 new factors were added and 3 others translated in the context of construction project management. All interviewees were strongly agreed with the occurrence of corrupt practices and their hazardous impacts on PIPs in Pakistan. Table 1 shows the background of the interviewees.

Table 1. Background of interviewees

Code	Designation	Exp. (years)	Education	Contractual Party	Location
A	Project Manager	23	Master	Contractor	Punjab, Pakistan
B	Contract Manager	18	Master	Consultant	Islamabad, Pakistan
C	Site Engineer	10	DAE	Contractor	KPK, Pakistan
D	Structural Engineer	28	Master	Consultant	Punjab, Pakistan
E	Sub-divisional Officer	12	Bachelor	Client	Sindh, Pakistan

STAGE 2: QUESTIONNAIRE SURVEY

Based on the findings of stage 1, a questionnaire survey was designed on Google Forms® based on the factors identified from literature and interviews. The target respondents comprised consultants, contractors, government officials, academicians, project managers and designers involved in PIPs in Pakistan. The questionnaire survey consisted of two sections; the first section collected the general information of respondents, such as their job description, qualification, experience and the contractual party they belong to. In the second section, respondents were acquired about their perception of corruption and the significance of various impacts in terms of public infrastructure project. They were required to answer on a Likert scale of 1-5 (1=very low and 5=very high). The survey was distributed among over 150 respondents through the internet, social networks and post. In some cases, the research team also visited the construction sites personally to collect survey responses. A total of 97 responses were received and 93 were found complete and valid for further analysis. As stated in the introduction, corruption is treated as taboo in construction and not many people are willing to participate. Owing to this inherent sensitivity, the sample size (93) and the response rate (66%) can be termed as acceptable. Further, it was also argued by Luangcharoenrat et al. (2019) that It is difficult to determine sample size owing to the distribution method. The survey remained open for 5 months. In the end, the data was compiled in spreadsheets and IBM SPSS Statistics 17 was used to analyze the data. Finally, conclusions were drawn based on the obtained results.

ANALYSIS OF FINDINGS

Validation and Reliability

The data was compiled in spreadsheets and analyzed by IBM SPSS Statistics 17. Reliability was checked through the most widely used reliability test; Cronbach's alpha. The value of Cronbach's alpha (Cα) could be anywhere in the range of 0 to 1, where a higher value represents greater internal consistency and *vice versa* (Enshassi et al., 2018). An alpha of 0.6 is the minimum acceptable level; preferably, alpha should be 0.70 or higher (Field, 2009; Garson, 2013). The Cα value was calculated through statistical software using the survey response data, which resulted in 0.75. This suggests that the data is highly reliable for further analysis (Bonett

and Wright, 2015; El-Mashaleh et al., 2014). Further, the ranking of various factors was done through relative importance index (RII) % based on the following equation.

$$Relative\ Importance\ Index\ (RII)\ \% = \frac{[\sum_{i=1}^{n} A_i(N_i)]}{AxN}\ x\ 100$$

Where 'A_i' is corresponding Likert score (i.e., A_1= Strongly Disagree = 1 and A_5 = Strongly Agree = 5). Similarly, 'N_i' is the number of respondents who gave A_i an answer (i.e., 26 respondents said 'Agree', so N_i will be 26 for A_4=4). Further, 'A' is the maximum Likert score (5 in this case) and N is the total number of respondents.

Respondents' Profile

The survey was distributed among various experts. Table 2 provides a general summary of the respondents' demography. It can be seen that data is collected from experts with pertinent education and experience in the relevant areas of work. This helped enhance the confidence in the findings obtained from the collected data.

Table 2. Summary of respondents' general demography

Party	No. of Respondents	Percentage %
Academia	22	24
Client/Owner	11	12
Contractor	17	18
Consultant	8	8
Project Manager	14	15
Architect/Designer	12	13
Quantity Surveyor	5	5
Others	4	3
Education		
B.Sc/ B. Eng.	34	37
MS/MSc/M. Eng.	43	46
PhD/D. Eng.	16	17
Experience		
Less than 1 year	4	4
1-5 years	40	43
5-10 years	31	33
11-15 years	3	3
More than 15 years	15	17
Age		
18-25 years	4	4
25-32 years	62	67
32-40 years	13	14
40+ years	14	15

Corruption and Pakistani Construction Industry

It is well established in the literature that Pakistan is adversely affected by corruption and PIPs are no exception. However, to enhance the confidence in the reliability of the assumption, the respondents were being asked the same question. Results strongly supported the statement as 50.5% of the respondents said 'Strongly Agree', 40.8% said 'Agree', while only 6.45% said that they strongly disagree with the above statement. These results established the fact that the Pakistani construction industry is exceedingly suitable for conducting studies relating to the corrupt environment.

Most Responsible Contractual Party

Most of the respondents (39.7%) said that corruption cannot be attributed to a single contractual party; every stakeholder is responsible at various levels. However, 24.73% of the participants blamed government officials for corruption. It was also revealed by some respondents during the data collection process that most of the time, government officers take a bribe for design approvals and interim payment certification. Even so, 17.8% of people said that it is the contractors who are most culpable for corruption. Further analysis of the question outlined an interesting outcome that respondents from various groups blamed the other contractual party for corruption, as shown in Figure 1. Contractors blamed government authorities; on the other hand, consultants accused contractors of corruption. It was mentioned by Rosenfeld (2009) that in construction projects, there is the tendency to hide the truth owing to the blame culture of the organization. A similar conclusion was drawn that everybody is aware of it, but nobody is ready to bear the responsibility.

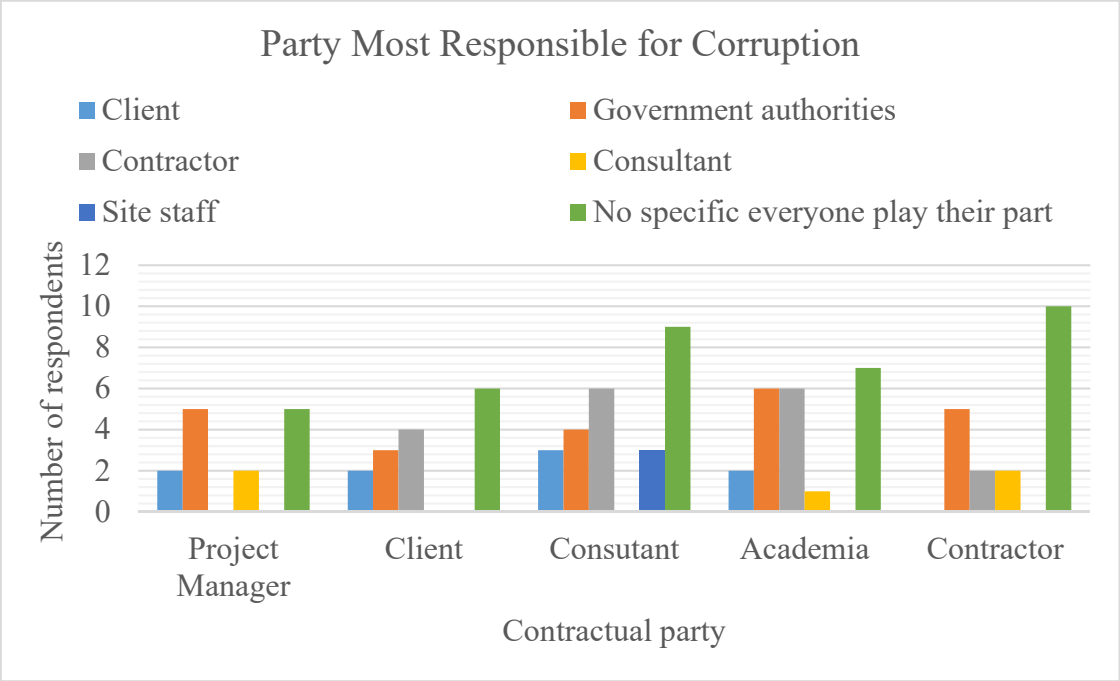

Figure (1): Party most responsible for corruption according to different stakeholders

Relative Ranking of the Factors

The respondents gave different Likert scores to various impacts of corruption on PIPs. Using the RII equation and IBM® SPSS STATISTICS 17 software, the 23 negative impacts factors were ranked. Results are presented in Table 3. "Creation of monopoly" is turned out to be the number one negative impact of corruption in PIPs with a percentage RII score of 80.00 and a mean of 4.00. It was also mentioned by Dimant and Tosato (2018) and Tanzi (1998) that the presence of approvals and regulations, to some extent gives monopoly power to authoritative officers who must sanction or scrutinize the activity. In the construction industry, monopoly is most common in the bidding period as well as during the issuance of interim payment certificates and design approval from the main contractors and governing authorities (Ameyaw et al., 2017). The findings of question 2 of the questionnaire survey also supported this fact, where government officials and governing bodies were nominated as most responsible for corruption.

'Increased operation cost' is the second most important factor in terms of consequence of corruption with RII percentage score of 79.35. It is due to day-to-day abuse of power termed as 'petty corruption' for personal financial gains. As mentioned previously, this form of corruption is common in developed countries and very difficult to eradicate (Barr and Serra, 2009). 'Lower quality' with RII percentage of 78.71 is ranked third. It is always an important concern for a construction firm how to attain a balance between quality and associated expenses (Abdelsalam and Gad,

2009). In a corrupt environment, builders, constructors and designers deliberately use lower-quality materials to save cost (Ameyaw et al., 2017).

Factors like 'decreased foreign investment' and 'lower government revenues' were also among the top-ranked factors. Habib and Zurawicki (2002) made a similar conclusion in their study that corruption has a negative impact on direct foreign investment as investors consider it a motivator to create operational inefficiencies. Further, it can also barricade the entry of small firms, which are the backbone of any growing economy. It has a hazardous impact on the life cycle of constructed facilities, as it tends to shorten the lifespan of building and infrastructure projects, which is ranked among the top 10 factors along with litigation and income inequality.

Corruption can also have social consequences, as it causes 12) customer dissatisfaction and can 11) dent social values. Further repercussions include 13) higher public investment, 14) reducing legitimacy, 15) mismanagement of the project, 16) increasing nepotism, 17) hindering socioeconomic development, 18) demotivating workers, 19) deteriorating the company image, 20) project abandonment, 21) cost of strict inspection, 22) decreasing productivity and 23) delivery time delays.

Table 3. Ranking of factors based on survey responses

Factor	Degree of importance quoted by 100 respondents					Total Respondent	Mean	SD	RII (%)	Rank
	5	4	3	2	1					
Creation of Monopoly	37	34	10	9	3	93	4.00	1.09	80.00	1
Increased Operational Cost	42	24	14	8	5	93	3.96	1.20	79.35	2
Lower Quality	42	22	15	9	5	93	3.93	1.22	78.71	3
Increase in Procurement Expenses	33	30	17	9	4	93	3.84	1.14	76.99	4
Decreased Foreign Investments	28	34	19	9	3	93	3.80	1.08	76.13	5
Lower Govt. Revenue	38	19	18	13	5	93	3.77	1.27	75.48	6
Barrier to the Entry of Small Firms	31	28	20	7	7	93	3.74	1.22	74.84	7
Shortening Lifespan of Constructed Facility	31	29	17	8	8	93	3.72	1.25	74.41	8
Hindrance Caused by Law and Litigation	23	35	23	10	2	93	3.72	1.03	74.41	8
Increase in Income Inequality	20	36	26	9	2	93	3.68	0.99	73.55	10
Denting Social Value	28	32	16	8	9	93	3.67	1.26	73.33	11
Customer Dissatisfaction	27	23	31	8	4	93	3.66	1.12	73.12	12
Higher Public Investment	28	23	29	7	6	93	3.65	1.18	72.90	13
Reducing Legitimacy	22	31	30	5	5	93	3.65	1.07	72.90	14
Mismanagement of Project	29	21	28	10	5	93	3.63	1.19	72.69	15
Increasing Nepotism	24	35	14	14	6	93	3.61	1.21	72.26	16
Hindering Socioeconomic Development	30	24	18	13	8	93	3.59	1.30	71.83	17
Demotivating Workers	30	16	28	12	7	93	3.54	1.27	70.75	18
Deteriorating the Company Image	29	18	28	10	8	93	3.54	1.27	70.70	19
Project Abandonment	22	29	23	14	5	93	3.53	1.17	70.54	20
Cost of Strict Inspection	15	31	24	18	5	93	3.36	1.13	67.10	21
Decrease in Productivity	20	23	26	17	7	93	3.34	1.22	66.88	22
Delivery Time Delays	23	14	27	18	11	93	3.22	1.33	64.30	23

It was observed that different contractual parties tend to blame each other for wrongdoings, such as design faults, quality nonconformance and corruption (Rosenfeld, 2009). To check the perception of different

project personnel about the ill effects of corruption, a detailed statistical analysis was performed. Table 4 shows how different contractual parties ranked different factors according to their experience.

Contractors were more concerned about the contractual award phase and government-related issues, which is why they ranked the creation of monopoly, lower government revenues and increased procurement costs as the top main deleterious effects of corruption. Similarly, consultants and clients focused on lower quality and operation and maintenance cost. On the other hand, project managers who are the heads of the execution and planning phases rated 'mismanagement of project' as the most harmful impact of corruption. They were also apprehensive about the lifespan of constructed facilities and the hindrance caused by law and litigation claims, since they disturb the smooth delivery of contracted works. Similarly, the academic community believes that corruption is a hindrance to the socio-economic development of the country. To validate the overall ranking and to check if whether there are any significant statistical differences between the rankings of various participant groups, an analysis of variance test was performed. The p-value (0.994) came out to be insignificant, which validated that there was no noteworthy variance between the groups.

Table 4. Ranking according to various parties

Factor	Contractors		Consultants		Clients		Project Managers		Academia		Overall	
	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Creation of Monopoly	0.800	1	0.784	7	0.747	4	0.729	8	0.900	1	0.800	1
Increasing O&M Cost	0.690	9	0.816	3	0.827	1	0.756	3	0.845	6	0.794	2
Lower Quality	0.718	5	0.840	1	0.758	3	0.686	14	0.863	4	0.787	3
Increased Procurement Cost	0.729	3	0.839	2	0.747	4	0.714	10	0.773	17	0.770	4
Decreasing Foreign Investments	0.679	14	0.752	10	0.733	7	0.686	14	0.899	2	0.761	5
Lower Govt. Revenues	0.788	2	0.792	5	0.613	19	0.714	10	0.809	12	0.755	6
Barrier to the Entry of Small Firms	0.694	8	0.752	10	0.747	4	0.729	8	0.800	15	0.748	7
Shortening Lifespan of Constructed Facility	0.576	22	0.760	9	0.720	9	0.757	2	0.864	3	0.744	8
Hindrance Caused by Law and Litigation	0.671	15	0.776	8	0.627	16	0.756	4	0.836	7	0.743	9
Increase in Income Inequality	0.706	7	0.792	5	0.733	7	0.714	10	0.709	23	0.735	10
Denting Social Value	0.729	3	0.816	3	0.667	12	0.629	20	0.755	19	0.733	11
Customer Dissatisfaction	0.659	18	0.720	15	0.693	11	0.742	7	0.818	11	0.731	12
Higher Public Investment	0.680	13	0.752	10	0.760	2	0.657	19	0.764	18	0.729	13
Reducing Legitimacy	0.681	12	0.752	10	0.667	12	0.686	14	0.809	12	0.729	14
Mismanagement of Project	0.682	11	0.744	14	0.587	22	0.771	1	0.809	12	0.727	15
Increase of Nepotism	0.671	15	0.720	15	0.640	15	0.714	10	0.827	8	0.723	16
Hindering Socioeconomic Development	0.671	15	0.712	17	0.600	20	0.686	14	0.864	3	0.718	17
Demotivating Workers	0.694	8	0.712	17	0.627	16	0.743	6	0.745	21	0.708	18
Deteriorating the Company Image	0.647	19	0.664	21	0.627	16	0.755	5	0.827	8	0.708	19
Project Abandonment	0.718	5	0.704	19	0.667	12	0.686	14	0.736	22	0.705	20
Cost of Strict Inspection	0.635	20	0.648	22	0.707	10	0.586	22	0.755	19	0.671	21
Decrease in Productivity	0.600	21	0.704	19	0.520	23	0.600	21	0.827	8	0.669	22
Delivery Time Delays	0.565	23	0.624	23	0.600	20	0.571	23	0.800	15	0.643	23

Does Corruption Have Any Positive Impacts?

The difficulty in eradicating corruption from the system is the positive-negative dilemma. Some policy makers and practitioners believe that corruption does have positive impacts, as it helps in achieving short-term goals and they termed it as "efficient corruption" (Locatelli et al., 2017). Some scholars also discussed the presence of this strange conception (Aidt, 2003). According to the supporters of this theory, corruption may play a role as "grease on the wheel" in economic growth, especially where public institutions are weak (Leff, 1964). Méon and Weill (2010) surveyed the efficiency of corruption and concluded that corruption can be positively related to efficiency in those states where institutional bodies are exceedingly ineffective.

Therefore, to check the perception of construction practitioners, respondents were inquired about their agreement or disagreement with the statement and if agreed, they were further questioned about identified positive impacts of corruption. The results were surprising, as only 24.73% of people negated the statement. The majority of the participants rated corruption as a wrongdoing, but they were still of the view that it does have positive impacts. Table 5 shows the top four rated positive impacts of corruption on construction projects.

Table 5. Positive impacts of corruption

Positive Impact	Total	Answered	No response	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Score	Rank
Faster documentary process	93	70	23	7	5	10	19	29	0.763	**1**
Reducing time delays	93	70	23	10	4	16	21	20	0.700	**2**
Increased competition	93	70	23	16	11	19	10	14	0.586	**3**
Motivation to work harder	93	70	23	29	4	3	13	21	0.580	**4**

CONCLUSIONS AND RECOMMENDATIONS

This paper examined the negative and positive impacts of corruption on infrastructure projects in the developing country of Pakistan. The country of Pakistan was selected, since it is highly aggrieved by corruption. Based on the findings, the following conclusions can be made:

- Despite high relevance to civil engineering projects, only a few corruption-related studies in the said community can be found and researchers seem to be afraid of this issue. Therefore, further studies need to be conducted on this topic.
- Different parties tend to blame each other for wrongdoings and irregularities; yet it was concluded that corruption cannot be attributed to a single contractual party and everyone is responsible for anomalies. Therefore, it should be monitored carefully, because it's easier to hide corruption and blame others due to the inherent complexity of infrastructure projects.
- The results indicated that most important factors like 'the creation of monopoly' and 'lower-quality construction' are severe, as they can hinder the entrance of small firms and portrays a bad image of the industry.
- It was also discovered that the construction community admits that corruption also has a few positive impacts, such as facilitating longer documentary processes, reducing work delays and motivating people through personal gains to work harder. The study concluded that the school of thought of positive corruption is a hurdle to system-wide suppression of corruption.

The findings of this study will help enhance the industry-wide awareness about corruption among stakeholders, as they will be apprehensive of its consequences. These findings add to the body of knowledge on construction engineering and management by providing a ranking of the most important impacts of corruption on construction projects.

Limitations and Future Scope

The research was conducted in a highly corrupt context of a developing country. Although the findings are interesting, they cannot be generalized to developed countries or to different contexts. Future studies can be conducted in developing countries and a comparison can be made between different situations. The results of the study are based on literature and survey responses, which can be biased owing to the sensitivity of the topic. Therefore, future research can be conducted using more comprehensive data in the form of cost, schedule and contract plan to verify the findings of the literature. Future research may be carried out on developing management strategies to get rid of corruption in construction projects.

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