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Effects of Corruption on Infrastructure Projects in Developing Countries

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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 developing countries. To emphasize the seriousness of the issue and to help eradicate corruption in construction projects, a comprehensive understanding of the effects of corruption is necessary. Therefore, the current study examined the impacts of corruption on infrastructure projects (IP) in the corrupt context of a developing country. Twenty-seven (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 on various infrastructure projects in Pakistan. Due to the sensitivity of the topic, difficulties were faced in acquiring data. The result demonstrated that corruption is widespread in the local construction industry and it has harmful impacts on project and society inform of the creation of a monopoly, increased procurement and maintenance costs, and lower quality products. The results also revealed that the construction community believes that corruption is beneficial in a way 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 an infrastructure project,especially in developing countries.This information would be useful for project personnel, stakeholders, and engineering society to enhance awareness among the parties for the eradication of corruption in construction. To the best of the authors' knowledge, it is the first study of its nature study on corruption in the local context.

Keywords: Corruption, Construction in Pakistan, Infrastructure, Corruption inconstruction, Project management

I. INTRODUCTION

Construction projects are intricate and complex in nature and consist of diverse stakeholders with varying degrees of knowledge and experiences [28,53]. Construction is a financially intense sector, representing a worth of around US$3,200 billion per year [41,75]. Corruption occurs almost in every construction project, both in developing and developed countries, which severely deteriorated the positive image of the industry [46,50,54,86]. American Society of Civil Engineers claims that corruption accounts for an estimated $340 billion of worldwide construction cost each year [75]. Similarly, According to the indexing of Transparency International, construction is one of the most corrupt industry among the various economic sectors [42,47].

Infrastructure projects (IP) are most vulnerable to corruption owing to a great amount of capital involved which triggers a surge in corruption risks in construction project management [42,47]. IP forms the backbone of every economy, and it is critical to the survival and livelihood of humanity, ranging from all kinds of structures (hospitals, roads, dams, etc.) to access to potable drinking water are all forms of infrastructure [15, 77]. When budgets allocated to procure these needs of humanity are misappropriated, the net result is a socio-economic setback[63]. It has hostile effects at various levels and leads to poor performance in terms of quality nonconformance, resource underutilization, schedule and cost overruns [2,8,13,62,71]. Therefore, it is a serious concern for all the growing economies to eradicate corruption from public infrastructure projects [51]. Various studies exist on the eradication of corruption on a macro level through various corruption-free indicators, professional standards, transparency, the fairness of punishment, procedural compliance and contractual compliance [29,43,83]. But, all of these policy and culture changes need decades for proper implementation, however, projects need to be constantly planned and delivered [51]. 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 [69]. As a result, the architecture and

engineering management community need to sermon the issue of corruption within the project domain i.e., on the micro-level.

A lot of literature is available on corruption but it is still a less explored area in project management journals [39,51,66,72]. Despite the high relevance to the built environment, conducting research on corruption is crucial due to the sensitivity of the issue and also it is challenging to point out the corruption even authorities designated for public accountancy are sometimes unable to identify the corruption [22]. Locatelli *et al.,* stated that corruption appears to be a 'taboo' in the project management community and researchers seem scared to research this topic [51]. He termed corruption in project management as "an elephant in the room". However, a recent upsurge has been seen in conducting research on this topic in construction engineering and management (CEM) yet the context of these studies is still diverse and wide [17,63,64].

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) [35]. Construction is among the major businesses which make a 2.3% contribution to the gross domestic product (GDP) of Pakistan [7,57,82]. 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 have been seen [27]. But Pakistan is ranked among the most corrupt countries in the world. According to Corruption Perception Index 2018 developed by Transparency International [81], 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 [65]. 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. Which led to a nationwide awareness campaign against corruption made by the Government of Pakistan [59].

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 [70]. No particular study has systematically categorized the ill impacts of corruption in construction projects. So, keeping in mind the context of corruption in the developing country of Pakistan and the vulnerability of public infrastructure projects to corruption, the current study aims to investigate the diverse effects of corruption on IP by generating a research question that "what will happen to the project performance if it is executed in a corrupt culture? This study is the first of its nature in the context of construction management. The findings will not only unveil the adverse impacts of the corruption to the project stakeholders but will also encourage the mission of 'corruption-free construction'.

II. STATE OF ART

'Corruption' is derived from the Latin word 'corruptus', which means broken or damaged [32]. Various definitions of corruption exist in literature which varies according to different industry, culture and norms [38]. According to Le *et al.,* [46] corruption is a behaviour that sacrifices the norms or principles for the interest of agents. The construction sector defined it as the misuse of the authority at the cost of the construction project for personal gains or benefits [5, 34, 46, 64, 75]. Those who were supposed to be the guardians of tax payer's money were discovered to be involved in financial loopholes and all kinds of immoral activities [17]. It is an intricate social phenomenon and the motivation to engage in corrupt behaviour are multifaceted and is the result of interactions at the micro-, meso-, and macro-level [22]. Discretionary power, economic rents and weak institutions are the main factors that favour corruption [3, 51]. Corruption deteriorates the image of the country and damages public trust [37]. Corruption can be divided into various types. According to Transparency International, 2015 divided 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.

As stated earlier that studies of diverse nature and context were carried out on corruption from construction project and procurement point of view. Le *et al.,* [46] investigated the causal link between the causes and vulnerability to corruption in Chinese public sector projects and found a positive correlation between the both. Bowen *et al.,* [13] analyzed the impact of corruption on the South African construction industry. He stated that government officials (as clients), main and sub-contractors are alleged to be the most tangled in corrupt practices. He further elaborated that bid evaluation is the most affected stage in the construction project. Ling *et al.,* [49] undertakes 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 underline that this type of contract may lead to allegations of corruption.

Scott [68] indicates corruption, inadequate sources of funding and price variation as a major factor that lead projects to failure in Nigeria. Tabish and Jha [78] stated that countries with high corruption spend comparatively a smaller amount on operations and maintenance and have the poor quality infrastructure. Similarly, a survey of construction industry ethical practices in the USA by Doran [23] found that 84% of the responding building owners, architects, building services 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.,* [9] stated that complex projects are more susceptible to corruption because the majority of complex projects are awarded by negotiation method.

Shan *et al.,* [71] developed a fuzzy model for the measurement of corruption in construction projects. Kingsford Owusu and Chan [42] studied the barriers that obstruct the effectiveness of anti-corruption measures (ACMs). Baring the background and taking inspiration from the previous studies the current research aims to find out the negative and positive impacts of corruption on IP.

III. METHODOLOGY

The main aim of the 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 2) Questionnaire Survey. In the first stage, a comprehensive literature review was conducted to identify various impacts of corruption on construction projects.

To further solicit the findings, the factors were tabulated and structured interviews were conducted with 5 experts working on IP. Based on the outcomes, a questionnaire survey was designed and was distributed to over 200 respondents. The factors were ranked through relative importance index (RII) %. A similar methodology was also adopted by Offei *et al.,* [61]. Fig. 1, presents the overview of the methodology

A. 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 and also in the identification of different negative and positive effects of corruption. Literature review helped in identifying the 27 corruption impacts on construction projects. The identified factors are presented in Table 1.

Table 1: Identified Factors.

Sr.	Factor	Selected References	Interviewees	Status
1	Decrease in Productivity	[12,21,45,47,64]		LB
2	Decrease Foreign Investments	[14,16,25,31]		LB
3	Higher Public Investment	[30,44,80]		LB
4	Cost of Strict Inspection	[4,18,36,51,86]		LB
5	Lower Government Revenue	[4,18,26,36,39,40,64]		LB
6	Mismanagement of Project	[51,73]		Translated
7	Delivery Time Delays	[20,51,60,86]		LB
8	Lower Quality	[26,39,40,51,64]		LB
9	Increase in Transaction Cost	[51]		LB
10	Creation of Monopoly	[46,85]	A, B, C, E	LB, IB
11	Barrier the Entry of Small Firms	[46,51,85]	C, D, E	Translated
12	Increase O&M Cost	[51]		LB
13	Reduce legitimacy	[51,85]		LB
14	Increase Income Inequality	[76,84]		LB
15	Hinder Socioeconomic Development	[33,74]		LB
16	Dent Social Value	[42,64]	D, B	LB, IB
17	Shorten Lifespan of Constructed Facility	[64]	C, D, E	Translated
18	Worker Demotivation	[19]	A, B, D	LB, IB
19	Deteriorate the Company Image		A, C, E	LB, IB
20	Customer Dissatisfaction	[19,58]	A, B, E	IB
21	Project Abandonment	[73]	C, D, E	IB
22	Cause Law and Litigation		A, D, E, C	IB
23	Increase Nepotism	[51]	B, D, E, C	IB
Positive Impacts				
1	Increased Competition	[51]	B, C	LB, IB
2	Reduce Time Delays	[24,51]		LB
3	Faster documentary process	[24,55]	A, C, D, E	LB, IB
4	Bribes motivates to work harder	[51]	B, C, D, E	LB, IB

(LB: Literature Based, IB: Interview Based)

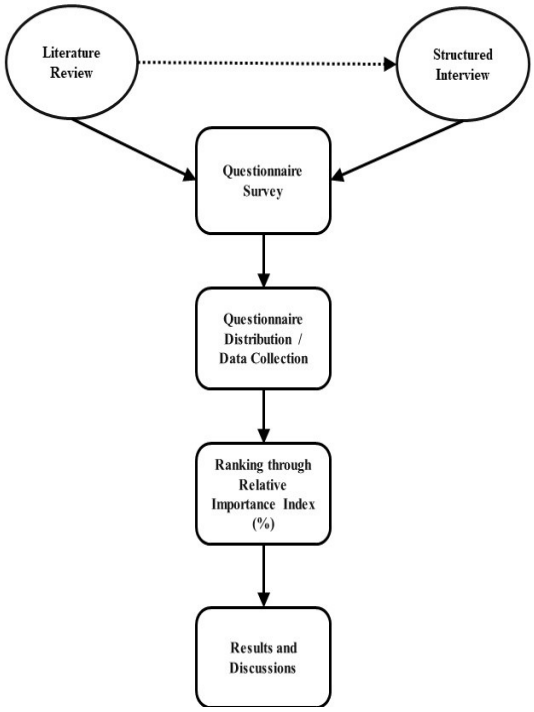

Fig. 1. Flowchart of Research Methodology.

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 construction project and based on their experience, give suggestions if they found any missing information or relevant factor. The ranking was not done at this stage. The interviewees were conducted from different contractual parties having vast experience of the construction projects. 4 new factors were added and 3 others were translated in the context of construction project management. All interviewees were strongly agreed with the occurrence of corrupt practices and their hazardous impacts on IP in Pakistan. Table 2 shows the background of the interviewees.

C. Questionnaire Survey

A questionnaire survey was designed based on the factors identified from literature and interviews. The target respondents comprised consultants, contractors, government officials, academicians, project managers and designers involved in IP 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 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).

B. Sampling

The questionnaire was distributed among over 200 respondents working on ongoing infrastructure projects in Pakistan. It was sent in two ways: via the internet (email, Facebook, WhatsApp) and in some cases, the research team also visited the construction sites personally to collect survey responses. According to Luangcharoenrat *et al.,* [52] it is difficult to determine sample size owing to thedistribution method. Therefore, the survey remained open for 5 months and maximum responses were collected. A total of 97 questionnaires were filled by highly experienced construction professionals including managers, engineers, and academics experts, out of these, 93 were found complete and valid for further analysis. The data was compiled in spreadsheets and IBM SPSS Statistics 17 was used to analyze the reliability and validity of data.
In the end, conclusions were drawn based on obtained results.

D. Validation and Reliability

The data was compiled in spreadsheets and was analyzed by IBM SPSS Statistics 17. The reliability was checked through the most widely used reliability test Cronbach's alpha which resulted in $\alpha = 0.75$.

Table 2: Background of Interviewees.

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

This suggests that the data is highly reliable for further analysis [11]. Further, the ranking of various factors was done through RII % based on the following equation.

$$Relative\ Importance\ Index\ (RII)\ \% = \frac{[\sum_{i=1}^{n} Ai(Ni)]}{AxN} x100$$

Where 'Ai' 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 Ai an answer (i.e., 26 respondent said 'Agree' so Ni 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.

IV. ANALYSIS OF FINDINGS

A. Respondent Profile

The survey was distributed among various experts. Table 3 provides a general summary of the respondent's demography. It can be seen that data is collected from experts with pertinent education and experience in the relevant areas of work. This helped to enhance the confidence in obtained findings from the collected data.

B. Corruption and Pakistani Construction Industry

Although, it is well established in the literature that Pakistan is adversely affected by corruption and IP is 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 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.

C. Most Responsible Contractual Party

Most of the respondents (39.7%) said corruption cannot be attributed to a single contractual party, every stakeholder is responsible on various levels. However, 24.73% of 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 payments certification.

Even so, 17.8% of people said it is the contractors who are most culpable for corruption. Fig. 2 presents a pie chart of the results.

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 3. The contractor blamed government authorities on the other hand consultant accused contractors of corruption. This was mentioned by Rosenfeld [67] that in construction projects, there is a 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.

Table 3: Summary of Respondents General Demography.

Party	No. of Respondent	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	4	4
25-32	62	67
32-40	13	14
40+	14	15

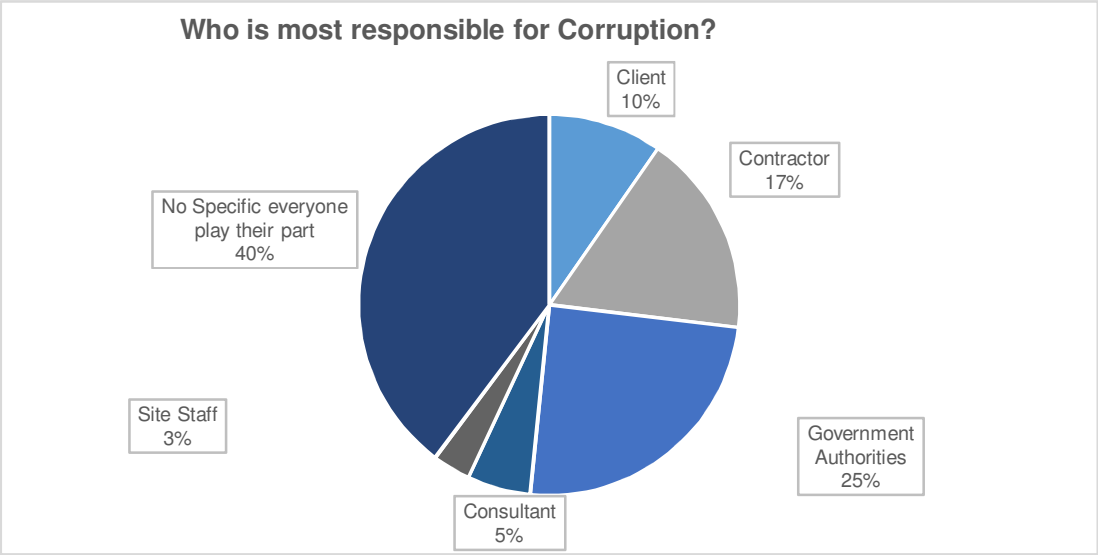

Fig. 2. Most Responsible Contractual Party for Corruption.

D. Relative Ranking of the Factors

The respondents gave different Likert scores to various impacts of corruption on IP. Using the RII equation, the 23 negative impacts factors were ranked. Results are presented in Table 4. "Creation of Monopoly" is turned out to be the number one negative impact of corruption in IP with a percentage RII score of 80.00 and mean of 4.00. It was also mentioned that the presence of approvals and regulations, to some extent gives monopoly power to the authoritative officers who must sanction or scrutinize the activity [22, 79]. 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 [6]. 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 the consequence of corruption with an RII percentage score of 79.35. It is due to day-to-day abuse of powers termed as 'petty corruption' for personal financial gains. As mentioned previously that this form of corruption is common in developed countries and it is very difficult to eradicate [10]. 'Lower quality' with an RII percentage of 78.71 is ranked third. It is always an important concern for a construction firm that how to attain a balance between quality and associated expenses [1, 41]. In a corrupt environment, builders, constructors and designers deliberately use lower quality materials to save cost [6].

Factors like 'decreased foreign investment' and 'lower government revenues' were also among the top-ranked. Habib and Zurawicki [31] made a similar conclusion in their study that corruption has a negative impact on direct foreign investment as the investors consider it as 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 that is the way it 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) reduce the legitimacy, 15) mismanagement of the project, 16) increase nepotism, 17) hinder socioeconomic development, 18) demotivate workers, 19) deteriorate the company image, 20) project abandonment, 21) cost of strict Inspection, 22) decrease in productivity and 23) delivery time delays. Since it was observed that different contractual parties tend to blame each other for wrongdoings such as design faults, quality nonconformance and corruption [67]. To check the perception of different project personnel about the ill effects of corruption a detailed statistical analysis was performed. Table 5 shows that 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 a monopoly, lower government revenues and increased procurement costs as the top main deleterious effects of corruption. Similarly, consultant and client's focus were lower quality and operation and maintenance cost. On the other hand, the project manager being the head of the execution and planning phase 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 it disturbs the smooth delivery of contracted works. Similarly, the academician community believes that corruption is a hindrance to the socio-economic development of the country. To validate the overall ranking and to check if there is any significant statistical difference 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 based on survey responses.

Factor	Mean	SD	RII (%)	Rank
Creation of Monopoly	4.000	1.093	80.00	1
Increased Operational Cost	3.968	1.202	79.35	2
Lower Quality	3.935	1.223	78.71	3
Increase in Procurement Expenses	3.849	1.142	76.99	4
Decreased Foreign Investments	3.806	1.076	76.13	5
Lower Govt. Revenue	3.774	1.269	75.48	6
Barrier the Entry of Small Firms	3.742	1.215	74.84	7
Shorten Lifespan of Constructed Facility	3.720	1.254	74.41	8
Cause Law and Litigation	3.720	1.025	74.41	8
Increase Income Inequality	3.677	0.991	73.55	10
Dent Social Value	3.667	1.263	73.33	11
Customer Dissatisfaction	3.656	1.118	73.12	12
Higher Public Investment	3.645	1.176	72.90	13
Reduce the Legitimacy	3.645	1.070	72.90	14
Mismanagement of Project	3.634	1.187	72.69	15
Increase Nepotism	3.613	1.207	72.26	16
Hinder Socioeconomic Development	3.591	1.304	71.83	17
Demotivate Workers	3.538	1.273	70.75	18
Deteriorate the Company Image	3.538	1.273	70.70	19
Project Abandonment	3.527	1.166	70.54	20
Cost of Strict Inspection	3.355	1.129	67.10	21
Decrease in Productivity	3.344	1.220	66.88	22
Delivery Time Delays	3.215	1.334	64.30	23

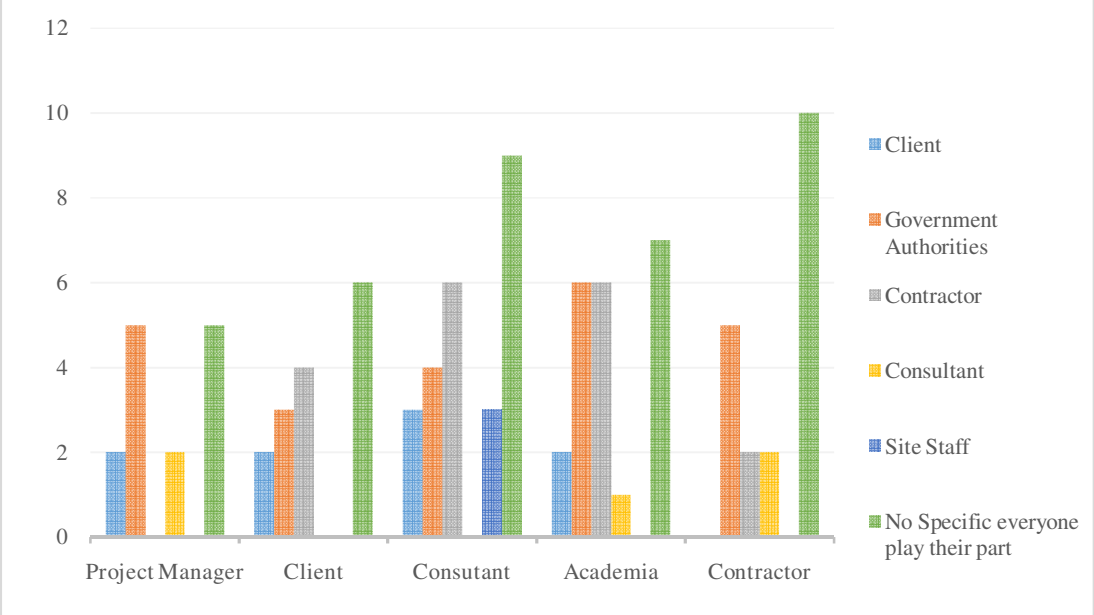

Fig. 3. Party most responsible for corruption according to different stakeholders.

Table 5: Ranking According to Various Parties.

Factor	Contractor		Consultant		Client		Project Manager		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
Increase 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
Decrease Foreign Investments	0.679	14	0.752	10	0.733	7	0.686	14	0.899	2	0.761	5
Lower Govt. Revenue	0.788	2	0.792	5	0.613	19	0.714	10	0.809	12	0.755	6
Barrier the Entry Of Small Firms	0.694	8	0.752	10	0.747	4	0.729	8	0.800	15	0.748	7
Shorten Lifespan Of Constructed Facility	0.576	22	0.760	9	0.720	9	0.757	2	0.864	3	0.744	8
Cause Law and Litigation	0.671	15	0.776	8	0.627	16	0.756	4	0.836	7	0.743	9
Increase Income Inequality	0.706	7	0.792	5	0.733	7	0.714	10	0.709	23	0.735	10
Dent 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
Reduce the 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 Nepotism	0.671	15	0.720	15	0.640	15	0.714	10	0.827	8	0.723	16
Hinder Socioeconomic Development	0.671	15	0.712	17	0.600	20	0.686	14	0.864	3	0.718	17
Demotivate Workers	0.694	8	0.712	17	0.627	16	0.743	6	0.745	21	0.708	18
Deteriorate 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

Table 6: 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**
Reduce 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**
Bribes motivates to work harder	93	70	23	29	4	3	13	21	0.580	**4**

E. Do Corruption Have Any Positive Impact?

The difficulty in eradicating corruption from the system is the positive-negative dilemma. Some policymakers and practitioners believe that corruption does have positive impacts as it helps in aching short term goals and they term it as "efficient corruption" [51]. Even some scholars also discuss the presence of this strange conception [3]. According to the supporters of this theory, corruption may play a role as "grease on the wheel" on economic growth especially where public institutions are weak [48]. Méon and Weill [56] surveyed the efficiency of corruption and they concluded that the 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 participant rate corruption as wrongdoing but they were still of the view that it does have positive impacts. Table 6 shows the top four rated positive impacts of corruption on construction projects.

V. CONCLUSION AND RECOMMENDATIONS

This paper examined the negative and positive impacts of corruption on infrastructure projects in the developing country of Pakistan. The results supported the statement as the majority of construction practitioners were strongly agree that corruption is widespread in infrastructure projects. It was established that corruption cannot be attributed to a single contractual party and everyone is responsible for anomalies. Moreover, it was also revealed that different parties tend to blame each other for wrongdoings and irregularities.

The study also ranked 23 identified negative impacts of corruption on IP and the construction industry. The results indicated that the creation of a monopoly, increased operational and procurement costs, lower quality construction, and decrease in direct foreign investments were found to be the most important ill effects of the corruption according to the construction practitioners and CEM community. It was also discovered that the construction community admit that corruption also has 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 school of thought of positive corruption is a hurdle to system-wide suppression of corruption.

The findings of this study will help to enhance the industry-wide awareness about corruption among the 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. It is the first of its nature study in the context of the local construction industry. Future research may be carried out on developing management strategies to get rid of corruption from construction projects.

VI. LIMITATIONS AND FUTURE SCOPE

The research was conducted in the highly corrupt context of a developing country. Although the findings of the studies are interesting, they cannot be generalized to developed countries or a different context. A future study can be conducted in developing countries and a comparison can be made between both situations.

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.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known monetary interests or personal relationships that could have appeared to influence the work reported in this paper.

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