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Why Infrastructure Megaprojects Overrun: Policy and Financing Constraints in Pakistan

[1]Osman Bin Saif
[2]Khalid Mumtaz
[3]Asma Zeeshan
[4]Sidra Gazali
[1]Faculty Bahria University, Islamabad.
[2]Faculty Bahria University, Islamabad.
[3]Faculty Bahria University, Islamabad.
[4]Faculty Agriculture University, Rawalpindi.
[1]osmansaif.buic@bahria.edu.pk, [2]khalid@bahria.edu.pk, [3]Asmaz.buic@bahria.edu.pk, [4]sghazali84@gmail.com

Abstract

Megaprojects have always been center of attraction for researchers and practitioners due to the associated resources, costs and benefits for the economy and society. Timely completion within allocated budget and required qualitative aspects render any project a success, whereas, additional costs and delays of time of completion make a project failure. Due to these factors megaprojects of infrastructure development have attracted research in recent decades. Investment of huge resources and capital require Government to initiate and own megaprojects in many of the developed and developing countries. Pakistan being a developing country face difficulties in planning, and financing of megaprojects. In Pakistan, plenty of megaprojects for infrastructure development fail to follow timelines and costs estimated for the project due to various reasons. This study adopted behavioral approach by analysis of subjective thoughts of those involved in development projects to identify underlying reasons that lead to overruns of costs and time. For this purpose, qualitative interviews of public sector officials from Planning Commission, Finance Division and highway authority have been conducted. Data from the interviews had been transcribed for analysis while maintaining the anonymity of the participants for confidentiality. Analysis of the transcribed data revealed various factors that contribute to delays in infrastructure projects where major causes are problems in land acquisition and payment issues for land, problems in relocation of facilities from project site, late payments to contractor for completed work, issues in getting credit from local and international agencies, and lowest bid award system for contractor selection as it leads to selection of contractor with limited capacity of project execution. These factors could be grouped into prime themes of overruns in Pakistani megaprojects as scarcity of funds, difficulties of arranging finance by internal borrowing, and from international sources due to bad reputation of the country.

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Corresponding Authors*

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Introduction

Mega projects are always the centre of attraction due to the enormity of success or failure associated to them. Frimpong, Oluwoye, and Crawford (2003) terms a project to be a success if it is finished and handed over on time, within allocated budget, and according to the quality requirements specified by the client. A megaproject with overruns of costs and time is a phenomenon commonly faced in both developed and developing countries, though, with different dynamics involved in the project (Reina & Angelo, 2002). The biggest concern in major programmes is that their problems match their physical and financial size (Merrow, McDonnell, & Argüden, 1988). In the recent past, the research on mega projects has become dominant problem in the international community (Jia, Yang, Wang, Hong, & You, 2011). Developing economies generally order to invest in large scale infrastructure development and construction projects (Prasitsom & Likhitruangsilp, 2015). Development of these projects require huge monetary and human resources. Since, building huge engineering mega projects require excellent expertise, sophisticated equipment and machinery, well organised teams with adequate financial resources (Akhund, Khoso, Pathan, Imad, & Siddiqui, 2018). This is major factor of reluctance of private companies in Pakistan investing huge capitals due to economic and political instability, perception of corruption and other risks which may affect returns on their investment. Therefore, in Pakistan, Governments have overseen, financed, possessed and worked these activities. Though, given the budgetary weights on the administrations, and a powerlessness to deal with these tasks proficiently, governments are currently promising the private part to assume a more noteworthy job in structure and overseeing foundation ventures (SBP, 2009). In the mega projects of developing infrastructure, complexities and vulnerabilities are extremely normal and peculiarity and uniqueness of framework activities are because of their one of a kind social and ecological necessities (Guo, Chang-Richards, Wilkinson, & Li, 2014). Different stakeholders associated with a mega project perceive success of the project differently. It is due to variations in the criteria established for success of a project and performance of project when compared with the criteria (Turner, 2009). Ogunlana (2008) explains that a mega project may appear to be a complete success to its client whereas whole failure for contractors and/or end-users. Risks of mega projects are ending up progressively differing, in this way, it is important to consider dangers that may jump out at an undertaking before the execution of the venture (J. Park, Park, Cha, & Hyun, 2016).

It isn't sufficient to characterize an exact goal of the undertaking which must be accomplished, regardless of whether this is the most significant component of the task the executives. It is important to deal with required assets and the proficiency of their use so as to achieve characterized targets. There are numerous strategies for the appraisal of proficiency, so it isn't so enormous an issue to evaluate it if the undertaking is effective enough. Be that as it may, each venture (and particularly enormous undertakings or megaprojects) are associated with a particular number of variables, which can undermine the accomplishment of task destinations and cause the task vulnerability (Hromádka, Vítková, Záhorská, & Bártů, 2015). Risk factors associated with mega projects are complex (Iyer & Sagheer, 2009) and these projects have high propensity of change, and risk-factors need to explored accordingly (J. Park et al., 2016).

Inefficiency in managing a public sector mega project is a serious issue for many countries, especially developing economies (Kossova & Sheluntcova, 2016) exemplified by cost overruns in mega projects of developing and developed countries (G. J. Sweis, 2013), and Pakistan is not different. For instance, mega projects of transport infrastructure such as road,

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Vol. 3 No. 9 (2025)

rail and bridges etc. have the eighty-six percent (86%) probability of exceeding their initial cost targets (Flyvbjerg, Holm, & Buhl, 2002). Also, Elinwa and Joshua (2001) reported that circa 80-90% of construction projects had time delays and approximately 89% of these projects were public sector projects. Similarly, Assaf and Al-Hejji (2006) found that circa 70% projects were delayed against planned time of completion. In addition, determination of causal nature of cost overruns is seemingly unpredictable and testing exercise (Ahiaga-Dagbui, Love, Smith, & Ackermann, 2017; G. J. Sweis, 2013).

When measured against golden triangle of measuring success of projects, i.e., on time, on cost and quality (Atkinson, 1999), most of the megaprojects initiated by the Government of Pakistan appear to be failure, in the recent years. Studying megaprojects in Pakistan gains significance as it represents a developing country still struggling on economic front. In Pakistan, some of the studies have attempted to find out the causes of delays and cost overruns in mega projects such as Haseeb, Lu, Bibi, Dyian, and Rabbani (2011); Jamil et al. (2012); Nasir, Gabriel, and Choudhry (2011), and Rahsid, Haq, and Aslam (2013), to name a few. In Pakistan, there has been prime focus projects of transportation in the recent decades, because, most of transportation within Pakistan is carried out over roads (M. T. Masood, Khan, & Naqvi, 2011). Many projects of transportation infrastructure have been actualized and executed to expand the commitment of street area to the GDP of nation as practically 80% of the business traffic is subject to national parkways (National Highway Authority website). Unfortunately, many of these projects failed to achieve the objectives of completion within stipulated time and budgetary allocation (Nasir et al., 2011). A key question therefore arises; 'who is to blame?' Although strategic misrepresentation, poor execution, mismanagement and corruption are popular answers, we cannot ignore the fact that despite all biases, the Government's do have a reputational risk at stake and they cannot be the sole reason for complete failure. Therefore, this research seeks to explore possibilities which could be the root causes of failure of a mega project. Thus, this research will be focused on the finding the answer of following research question;

Why are Government-owned megaprojects failing in Pakistan? A study of infrastructure projects of last decade

In order to find the factors causing the problems of failure of mega projects, we will be drawing on several hypotheses and searching for evidence from within the public sector organisations, i.e., the Government Departments as well as other stakeholders involved in the mega projects. A comparison will also be drawn by surveying private organisations that have successfully carried out similar large-scaled programmes to find out how do they manage their projects to be successful when compared with those of Government.

As Booth et al., (2003) says, research provides a great sense of accomplishment and adds to human knowledge as well as contributes in providing solution to longstanding problems. Likewise, it is essentially important for Pakistan to find out the real reasons behind delays and cost-overruns of their projects which eventually effects end results upon completion. This may contribute phenomenal growth and benefits and add economic value to the State. This study is envisages to enhance the literature on delays in mega projects of infrastructure developments. It will also serve as first step towards comprehensive assessment of the real subjective reasons that cause delays on completion and successful delivery of projects.

Understanding Megaprojects

Gellert and Lynch (2003) classify megaprojects into four kinds; infrastructure projects, e.g., railways, ports and dams; extraction projects, e.g., minerals, oil and gas; production, e.g., chemical plants, manufacturing and assembling parks; and consumption, e.g., tourist resorts,

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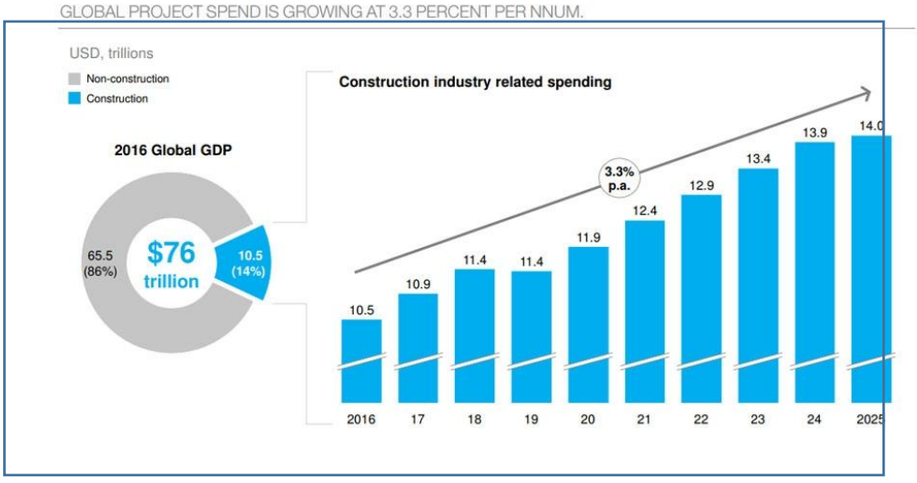
shopping centres, and amusement parks. Hirschman (2014) described that megaprojects are not only merely expanded forms of conventional projects, but these are endeavored to bring evolutionary changes in society. Therefore, it is essential to take care of complete effects of megaprojects on society and their proficiency as a result of effects of these, i.e., technical, monetary, legal and natural environmental, are tremendous. Extraordinary public consideration and additional political interests are enticed by these mega-projects due to significantly high expenditure, and they have immediate and indirect effects on society, budgets, and environment (Capka, 2004). Megaprojects play a pivotal role in the advancement of society and newer techniques of project management permit the world endeavor in more complex and massive megaprojects. McKinsey (2017) reports that the number of megaprojects is on the rise, as they indicated about 3660 new megaprojects in the development with an average of USD3.8 billion, for a complete speculation profile of USD14 trillion. They expect a 3.3% increase per annum in these megaprojects and this tendency to continue until 2025. The trend of the world's spending on megaprojects is represented in Figure – I.

Figure – I: Expected global spending on projects (McKinsey, 2017)



Megaprojects are enormous in scale complex endeavors, which generally cost a billion dollars or more, take numerous years to completion, including working of various partners from the public and private sectors of an economy, are transformational, and effect a great many individuals (Floricel & Miller, 2001; Flyvbjerg, 2014). Capka (2004) and Flyvbjerg, Bruzelius, and Rothengatter (2003) describe a minimum of three attributes related with megaprojects are; huge amounts of resources, the high effect on human, society and environment and great complexity involved. A large number of activities, financial expenditure, equipment, and workers required in addition to plentiful factors of uncertainty and their interplay bring complexity into megaprojects (Mihm, Loch, & Huchzermeier, 2003; Sommer & Loch, 2004).

All the factors mentioned above are involved in megaprojects require precise management of risks due to uncertainties in the possible outcomes, is the prime factor in megaprojects. Miller and Lessard (2007) termed risk as to the probability of outcomes that are different from those projected. The risk may also be thought of a component of uncertainty that invariably effects expected outcomes of the work done by personnel and megaprojects. On the one hand, the risk is related to anticipations of having amazing economic outcomes, whereas, on the hand, it might lead to losses that could cause the ruin of the project (Smejkal, 2010). McKinsey (2017) studied 500 US-based major projects of various industries and reported that they incline towards heavy overruns. These are summarized in Figure – II. Flyvbjerg (2006) reports that risks are inherent in megaprojects because of longer forecasts and planning and

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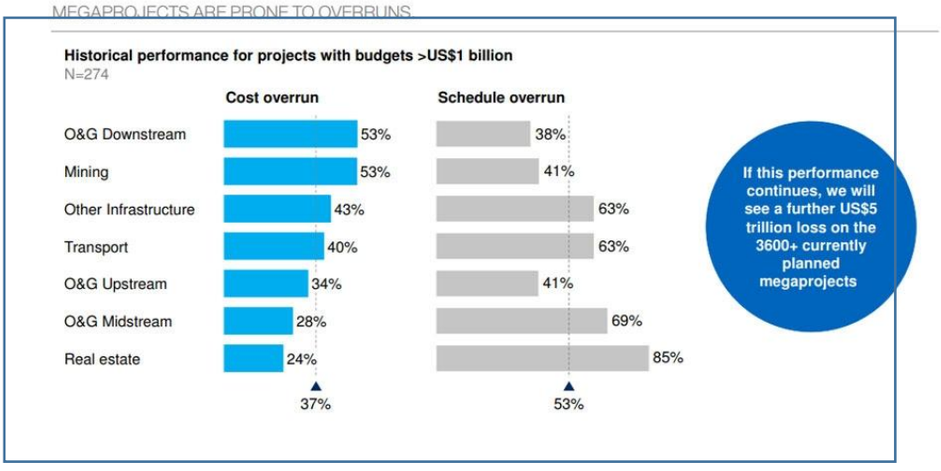
complexities involved in various aspects. K.-Y. Park, Young, and Kim (2009) characterized risk factors in development stages into the public establishment, organizer and affiliation, a development firm, and an administration organization as per the partner companies. Identification of these risks become critical due to large time horizon involved and interaction of human input with other factors in planning and executing megaprojects. These interactions lead to various outcomes when evaluating megaprojects.

Figure – II: A comparison of 500 US-based projects (McKinsey, 2017)



Flyvbjerg (2013) identified following attributes; where a megaproject is characterized as an undertaking costing a hundred million dollars or progressively; a noteworthy program as a suite of activities costing a billion dollars and up. The vast majority of the part's decisions apply similarly to significant undertakings and real programs. Be that as it may, for simplicity of composing and perusing, "significant undertaking" is the principle term utilized in the content.

- Such activities are inalienably dangerous because of long arranging skylines and complex interfaces.
- Decision-production, arranging, and the executives are ordinarily multi-on-screen character forms with clashing interests.
- Technology and plans are regularly non-standard.
- Often there is over-commitment to a specific undertaking idea at a beginning period, bringing about "lock-in" or "catch," leaving choices examination powerless or missing, and prompting raised duty in later arranges.
- Due to the huge sums of cash included, head operator issues are normal.
- The venture extension or aspiration level will commonly change altogether after some time.
- Statistical proof demonstrates that such unpredictability and impromptu occasions are frequently unaccounted for, leaving spending plan and time possibilities woefully lacking.
- As a result, falsehood about costs, calendars, advantages, and dangers is the standard all through undertaking improvement and basic leadership.
- The outcome is cost overwhelms and advantage deficits that undermine venture practicality during undertaking usage.

Flyvbjerg (2013) further explains that It is valuable to recognize "causes" and "underlying drivers" in clarifying cost overwhelms, advantage deficits, and deferrals in real extends.

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Customarily, coming up next are recorded as reasons for undertaking underperformance in the writing and by and by: venture multifaceted nature, scope changes, innovative vulnerability, request vulnerability, sudden topographical highlights, and negative majority (for example restricting partner voices). Most likely, these elements one after another or another add to cost overwhelms and advantage setbacks, yet it might be contended that they are not the genuine, or root, source. The underlying driver of underperformance is the way that venture organizers will in general deliberately belittle or even overlook dangers of multifaceted nature, scope changes, and so forth during task advancement and basic leadership (Flyvbjerg, Garbuio, & Lovallo, 2009). Such obliviousness or underestimation of dangers is regularly called good faith, and on the off chance that we acknowledge this phrasing the underlying driver of underperformance is positive thinking, while unpredictability, scope, innovation, and so forth are essentially explicit issues about which organizers have been hopeful and through which confidence in this way shows itself. Essentially, it might be contended that raised duty and lock, where are additionally regularly recorded as reasons for underperformance, are not underlying drivers (Staw and Ross 1978). These wonders are so normal in significant tasks that the danger of their event ought to obviously be considered in sound undertaking arrangement. In any case, once more, such dangers are normally overlooked or thought little of and that is the main driver of underperformance of any project. Overrunning costs of megaprojects are common to construction industries in many countries (G. J. Sweis, 2013) and this important factor has attracted the attention of researchers in latest decades (Creedy, Skitmore, & Wong, 2010; Doloi, 2012; Frimpong et al., 2003; Koushki, Al-Rashid, & Kartam, 2005). It is because the cost is one of the major basic criteria for determining the success of a megaproject (Becker, Jaselskis, & El-Gafy, 2014; Memon, Rahman, Aziz, & Abdullah, 2013; San Cristóbal, 2009). Though cost still holds inherent association with other performance measurement criteria of megaprojects, for example, value for money, time, and quality (Holt, 2010). World's top ten megaprojects cost overruns expressed as a percentage are given in the Table – I.

Table I: ***World's top ten megaprojects cost overruns (Flyvbjerg, 2014)***

Project	Country	Cost overrun (%)
Suez Canal	Egypt	1,900
Scottish Parliament Building	Scotland	1,600
Sydney Opera House	Australia	1,400
Montreal Summer Olympics	Canada	1,300
Concorde Supersonic Aeroplane	UK/France	1,100
Troy and Greenfield Railroad	US	900
Excalibur Smart Projectile	US/Sweden	650
Canadian Firearms Registry	Canada	590
Lake Placid Winter Olympics	US	560
Medicare Transaction System	US	560

Similarly, time and its management in the execution of megaproject play a key role in its success (Khanh & Kim, 2013). Also, different stakeholders in a project desire to know the current status of progress in addition to planning and development of projects so that partnering agencies can better control the progress in a project and any factors that have the potential of causing delays could be identified earlier (Umair, Choudhary, & Jahanzaib, 2014). On the contrary, various stakeholders involved in a megaproject perceive the success of the project differently (Bryde & Brown, 2004). It is especially true in the case of public sector projects where a large number of stakeholders are involved, and it becomes important for all

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Vol. 3 No. 9 (2025)

the interested parties to have a common understanding of the success of the project. Despite wide research, an agreed set of key performance indicators for megaprojects is yet to be achieved (Chan, Scott, & Chan, 2004).

Megaprojects' studies in Pakistan

Historically spending on megaprojects of infrastructure development in Pakistan has been very low when compared against spending on the non-improvement project, which is evident from the public places, utility administration and even in the civic facilities in metropolitan urban areas (Mehar, 2017). Pakistan is ranked at 128th position in the supply of power, 115th in the fixed phone lines, 107th in cell phone memberships and at 100th in the quality of general infrastructure. Pakistan's ranking in the world based on the quality of infrastructure is summarized in Table – II.

Table II: ***Pakistan's global ranking in infrastructure (Mehar, 2017)***

Indicator	Rank (out of 139)
Quality of overall infrastructure	100
Quality of roads	72
Quality of railroad infrastructure	55
Quality of port infrastructure	73
Quality of air transport infrastructure	81
Available airline seat kilometres	48
Quality of electricity supply	128
Fixed telephone lines	115
Mobile telephone subscriptions	107

Most of the megaprojects in Pakistan are developed and carried out by the Government (SBP, 2009), the knowledge of project management practices in the public sector is still far from the private sector business environment. Numerous reasons account for this lack in the public sector. It is problematic to follow the world-class practices in the local environment due to the complexities involved and deficiency of overseeing efforts (Umair et al., 2014). Megaprojects in Pakistan, particularly government-financed ventures, generally fail due to delays that surpass their fulfillment time by up to 100% in addition to cost overruns (Jamil et al., 2012), and times overruns, e.g., delays from five to six years in hydro-power projects in Pakistan (Batool & Abbas, 2017). It is because numerous probable outcomes could lead to time overruns in projects as there are many entities related to the structure and development process, which could be accountable for time overruns. Water and Power Development Authority (WAPDA), National Highway Authority (NHA), Communications and Works (C&W), Pakistan Railways (PR), Civil Aviation Authority (CAA) and various federal and provincial building departments are major owners in public sector of Pakistan.

The studies of some of the researchers who analyzed the reasons for the failure of megaprojects in Pakistan in the last ten to fifteen years are reviewed and discussed here. Nasir et al. (2011) attempted to find out the reasons of cost and time overruns in highway projects of Pakistan through data collected from construction contractors and consultancy firms hired for road construction projects of federal and provincial Governments of Pakistan. Their study recognized deferrals in payments to contractor firms, land acquisition process, price increase in building materials, inadequate planning, low level of expertise of contractor's workers, handing over site to contractor firm, and changes or modifications in project due to improper government policies and priorities, as major causes of failure of projects. Also, Rahsid et al. (2013) investigated reasons of overruns in Punjab-Pakistan Government-funded megaprojects by collecting data from the large construction firms are contractors of Government and reported major factors causing overruns in time and costs; are Government leaving the project, mediation, and arbitration, disputes, and lawsuits.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

To identify factors of overruns in megaprojects in Pakistan due to the owner of the project Jamil et al. (2012) investigated reasons caused by owners that led to overruns in time, and value for money by examining one road construction and two housing contractors engaged in megaprojects of Federal Government of Pakistan. Their study revealed the absence of complete information, poor planning of various phases of the projects, and their effect on cost and time caused overruns. Whereas, Haseeb et al. (2011) contacted public sector officials, contractors, private clients, and consulting firms to investigate the reasons of delays and effects of these delays on mega construction projects in Pakistan. They report sixteen major factors, which include funding and payments, incorrect estimates of time and costs, nature of materials involved, late payments to contractors and subcontractors, poor management of site, natural calamities, unanticipated conditions at site, shortage of construction materials, late supplies from subcontractors, modifications in project details, inappropriate equipment, changes in orders made, and modifications in administrative design.

Ali and Memon (2009) analyzed three construction megaprojects and revealed grave inadequacies of owners for poor planning and development about unforeseen conditions at the site, estimating time and costs, and even viability of the projects, absence of performance measures of the project worsened the situation. A review of a hydropower megaproject by Umair et al. (2014) revealed 202% cost overrun and 25% time delay due to over fifteen major factors and their interactions caused these overruns. These factors include; poor planning and development, award of contract to lowest bidder; delays in awarding project after design completion, site handover to the contractor, payments to contractor; and frequent changes in design, orders, orders of variation at construction site; unanticipated site conditions, and natural disasters; and escalation in prices of materials needed; and fluctuations in currency exchange rate. Findings of these studies are summarized in Table – III.

Table III: ***Causes of overruns in megaprojects in Pakistan***

Citation	Stakeholder groups/ entity studied	Causes of overruns
(Ali & Memon, 2009)	Project	Poor planning and development of unforeseen site conditions, time and associated costs, the viability of the project
(Haseeb et al., 2011)	Construction contractors, public sector officials, consultancy firms, site workers, and private clients	Poor estimates of time and costs, delays in; funding and payments to contractors and subcontractors, poor management of the site, unforeseen site conditions, natural calamities, shortage of supplies, late supplies from subcontractors, modifications in project details, inappropriate equipment, changes in orders and inadequate overseeing of the project
(Jamil et al., 2012)	Construction firms	Incomplete information, Poor planning and development of the project, Impact of poor planning and development on costs and time of completion
(Nasir et al., 2011)	Construction contractors, consultancy	Poor planning, Delays in;

Policy Journal of Social Science Review
Online ISSN 3006-4635
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Vol. 3 No. 9 (2025)

	firms	payments to contractors, land acquisition processes, handing over the site to the contractor Price increase in materials, Low-level expertise of contractor, Improper Government policies, and Changes in Government priorities
(Rahsid et al., 2013)	Construction firms	Government abandoning project, Mediation and arbitration, and Disputes and lawsuits
(Umair et al., 2014)	Project	Poor planning and development, the award of a contract to the lowest bidder, delays in; awarding the project to contractor, site hand over to the contractor, payments to contractor, and changes in; design, orders, orders of variation at the construction site, prices of materials needed, foreign exchange rate, and; unanticipated site conditions, natural disasters

Overruns in projects of highway authority of Pakistan

Overruns in megaprojects of highway authority have turned out to be the norm because of numerous factors, which include but are not limited to conflicting strategies, deficiency of assets, security reasons, debasement and obstinate inadequacy concerning contractual workers, it is found out. Various reports of highway authority uncover that a portion of the fundamental road project's expense heightened by more than 200 percent is still in the process of implementation despite time lapse of more than ten years in some cases. Reports also reveal a few tasks get deferred because of deficiency of finance, defective planning, movement of utilities and land securing, bringing about cost heightening. Be that as it may, sometimes contracts are granted to temporary workers based on networking with Government/ public sector officials who at that point continue to postpone execution to raise development charges complex, they included. Details of some of the megaprojects are given below as examples of overruns in various highway authority projects of vital importance in infrastructure development.

Development of the Lowari Tunnel started in September 1975 as a railroad tunnel. However, construction work was ceased in 1977 after the formation of a new Government. Development restarted in September 2005 at first with a booked consummation in three years. However, that time was stretched out after it was chosen to change over it to a road tunnel. In 2015, the Government affirmed extra financing for an amended project plan of the Lowari Tunnel and demonstrated that it would be finished by October 2017 at an expected expense of Rs 27 billion against the initial estimated cost of Rs 7 billion.

The expense of Lyari Expressway undertaking has expanded by 154% with the first expense of Rs 5.9 billion that was affirmed by the Executive Committee of the National Economic Council (ECNEC) to Rs 12.99 billion. At the point when work began the Lyari Expressway in May 2002, the NHA had planned consummation in 30 months, i.e., by

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

November 2004, however, after the lapse of fifteen years, the project finally completed in 2018. Major delays identified from reports are encroachments, suit, and finance availability.

Karachi Hyderabad Motorway (M-9) project at the expense of Rs 24.93 billion to the Malaysian development organization, Bina Puri Holdings on Built Operate Transfer (Mukherjee, Mitchell, & Talbot) base in 2012, however, the agreement was void with the two partners blaming each other for not satisfying legally binding responsibilities. The project was later granted to Frontier Works Organization (FWO). The project started on September 17, 2015 and is booked for consummation by December 2019 at an estimated cost of Rs 50.36 billion.

Another case of overruns in transportation projects is Hassanabdal Havelian Expressway. NHA modified the project plan of Hassanabdal-Havelian Expressway (E-35) upward from Rs 30.97 billion to Rs 34.37 billion in the wake of changing over it to six paths and rolling out some different improvements in its structure. The expressway is expected to become fully operational by August 2019 against an initial estimate of December 2018.

The expense of Jalkhad-Chilas area raised to Rs 7.808 billion against the underlying expense of Rs 2.3 billion because of exorbitant postponement of more than six years in task consummation. The Jalkhad-Chilas area (68km) is the last segment of Mansehra-Naran-Jalkha-Chilas Road (N-15). It is a backup course of action to Gilgit-Baltistan, and Jalkhad-Chilas area was granted to FWO in November 2004. The initial project was expected to complete in 2008. The project was suspended in 2010 and resumed on September 2012 with reviewed cost of Rs 7.808 billion. The initial estimate of project completion time was four years; anyway, chip away at the undertaking was suspended in September 2010. The project was continued in September 2012 at a reexamined task cost of Rs 3,752 million which was later additionally amended upward to Rs 7.808 billion. The project is currently finished, and the last administrative work was in advancement — finally, the project completed in January 2017.

The 193km Gwadar-Hoshab segment of Rattodero-Gwadar Motorway (M-8) was finished in February 2016 against the underlying due date of 2006 at the expense of Rs 13 billion, changed a few times. Similarly, the rehashed changes in structure and predictable postponement in finishing Takht Bhai over-head extension has heightened the expense of the undertaking to Rs 836.47 million against the first expense of Rs 582.12 million. A unique time of the fulfillment was a year and a half which was later amended and reached out to 42.8 months, yet the venture still cannot seem to come around. The Nishtar Gath Bridge, one of the real framework ventures, costing Rs 5.49 billion, is relied upon to be finished for this present year. This proposed extension - interfacing Balochistan and Punjab using the GT Road (N-5) and the Indus Highway (N-55) on the two sides of River Indus were reported in 1988 by previous Prime Minister Benazir Bhutto however was postponed for various reasons referenced previously.

Furthermore, Khuzdar Rattodero section of M8 initiated in 2004 and expected to be operational in 2009. One section of this project of 58 km was completed in June 2018, and rest two sections are still under construction. Also, construction work on Kalat Quetta Chaman expressway started in 2006 with the expectation of completion in 2008. However, the project faced many delays and finally completed in June 2016 with cost of Rs 6 billion. Other examples of delayed projects of highway authority include Quetta Taftan Highway, Quetta Khuzdar Karachi Highway, Quetta Zhob Highway, Peshawar Torkham Raod, Takhtbhai Dargai Road, Malakand Tunnel Project, and Faisalabad Multan section of motorway.

Policy Journal of Social Science Review

Online ISSN 3006-4635

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Vol. 3 No. 9 (2025)

Global Studies

Assaf and Al-Hejji (2006) found that only 70% of the projects face time delays in Saudi Arabia. They report major reasons for time overruns include change orders made by owner during construction, late payments to the contractor, resultant poor site management by contractor, scarcity of labor, and problems in funding by the construction firm hired. Elinwa and Joshua (2001) reported that about 80-90% of the construction projects in Nigeria suffered due to delays in time and costs while most of the projects circa 89% were public sector projects. Also, Aibinu and Odeyinka (2006) discovered that approximately 88% of delay factors identified caused about 90% of complete delays in the projects in Nigeria.

Also, Sambasivan and Soon (2007) established that poor; planning and development, site management, and lack of expertise of contractor, insufficient financing and payment of completed work, issues of subcontractors, supply of labor, inadequate equipment, absence of proper communication among stakeholders, and mistakes in construction, were major causes of time overrun in Malaysian construction projects. Monetary problems of contractors, frequent changes by owners, improper planning by contractor, and insufficient supply of labour are found common factors that caused overruns of time and costs in Egypt (Abd El-Razek, Bassioni, & Mobarak, 2008), Jordan (G. Sweis, Sweis, Hammad, & Shboul, 2008), and Tanzania (Kikwasi, 2012).

Similarly, Doloi, Sawhney, Iyer, and Rentala (2012) reported reasons of overruns in construction projects in India, as poor; planning and development, commitment, site coordination and management, understanding of the scope of the project. However, slow decision-making of owners, poor productivity of labor, the reluctance of project designer to change, and repairs and rework due to errors in construction caused general overruns of projects. In India, the Ministry of Statistics and Programme Implementation (MOSPI) looks after public works projects, which cost IR100 crore or more. According to statistics presented to Lok Sabha (i.e., House of People or lower house of India's parliament), India, 315 projects out of 738 faced serious overruns of cost and time (MOSPI, 2015), a summary of the report is presented in Figure – III. In China, long contractual agreements, purchasing, and procurement, land acquisition, hiring of consulting firms, natural disasters, and public sector procedures caused delays in completion of projects (Ahsan & Gunawan, 2010). Aziz and Abdel-Hakam (2016) identified and compared several causes of overruns in construction projects in various countries, which are represented in Figure – IV.

Policy Journal of Social Science Review

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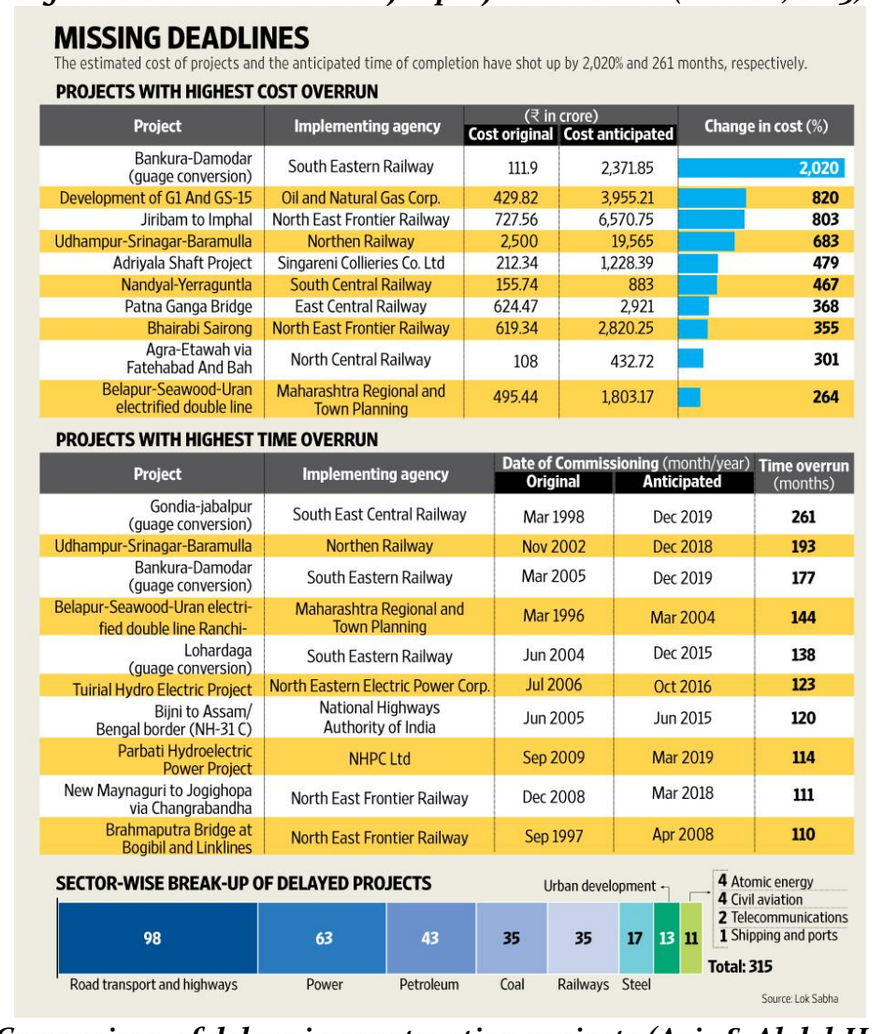
Vol. 3 No. 9 (2025)

Figure III: Overruns in major projects in India (MOSPI, 2015)



MISSING DEADLINES

The estimated cost of projects and the anticipated time of completion have shot up by 2,020% and 261 months, respectively.

PROJECTS WITH HIGHEST COST OVERRUN

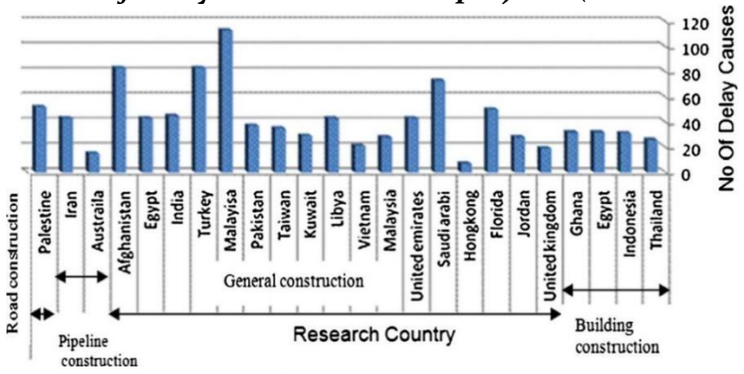
Project	Implementing agency	(₹ in crore) Cost original	Cost anticipated	Change in cost (%)
Bankura-Damodar (guage conversion)	South Eastern Railway	111.9	2,371.85	2,020
Development of G1 And GS-15	Oil and Natural Gas Corp.	429.82	3,955.21	820
Jiribam to Imphal	North East Frontier Railway	727.56	6,570.75	803
Udhampur-Srinagar-Baramulla	Northen Railway	2,500	19,565	683
Adriyala Shaft Project	Singareni Collieries Co. Ltd	212.34	1,228.39	479
Nandyal-Yerraguntla	South Central Railway	155.74	883	467
Patna Ganga Bridge	East Central Railway	624.47	2,921	368
Bhairabi Sairong	North East Frontier Railway	619.34	2,820.25	355
Agra-Etawah via Fatehabad And Bah	North Central Railway	108	432.72	301
Belapur-Seawood-Uran electrified double line	Maharashtra Regional and Town Planning	495.44	1,803.17	264

PROJECTS WITH HIGHEST TIME OVERRUN

Project	Implementing agency	Date of Commissioning (month/year) Original	Anticipated	Time overrun (months)
Gondia-jabalpur (guage conversion)	South East Central Railway	Mar 1998	Dec 2019	261
Udhampur-Srinagar-Baramulla	Northen Railway	Nov 2002	Dec 2018	193
Bankura-Damodar (guage conversion)	South Eastern Railway	Mar 2005	Dec 2019	177
Belapur-Seawood-Uran electri-fied double line Ranchi-	Maharashtra Regional and Town Planning	Mar 1996	Mar 2004	144
Lohardaga (guage conversion)	South Eastern Railway	Jun 2004	Dec 2015	138
Tuirial Hydro Electric Project	North Eastern Electric Power Corp.	Jul 2006	Oct 2016	123
Bijni to Assam/ Bengal border (NH-31 C)	National Highways Authority of India	Jun 2005	Jun 2015	120
Parbati Hydroelectric Power Project	NHPC Ltd	Sep 2009	Mar 2019	114
New Maynaguri to Jogighopa via Changrabandha	North East Frontier Railway	Dec 2008	Mar 2018	111
Brahmaputra Bridge at Bogibil and Linklines	North East Frontier Railway	Sep 1997	Apr 2008	110

SECTOR-WISE BREAK-UP OF DELAYED PROJECTS

Figure IV: Comparison of delays in construction projects (Aziz & Abdel-Hakam, 2016)



Explanation of Overruns in Megaprojects

The research on identifying the causes of delays and cost overruns has attracted the attention of many researchers around the world in the past decades. The literature points out imprecise forecasts of project measures of time, costs, demand and their interaction as the main cause of risks inherent in any project (Flyvbjerg et al., 2003; Flyvbjerg et al., 2002; Flyvbjerg, Holm, & Buhl, 2005). Most commonly, combinations of demand and cost forecasts are used to justify investments in large projects, especially in megaprojects of transportation, and these come

Policy Journal of Social Science Review
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Vol. 3 No. 9 (2025)

with serious inaccuracies (Flyvbjerg, 2006). Flyvbjerg et al. (2002); Flyvbjerg, Holm, and Buhl (2004); Flyvbjerg et al. (2005) tried technical, psychological, and political-economic explanations for describing inaccuracies in forecasting. Flyvbjerg (2006) reports the failure of technical explanations, which are most commonly found in literature, due to several reasons that point out factors other than poor data.

Instead, psychological and political-economic explanations reason well for imprecise forecasts. Psychological descriptions give reasons of imprecision in forecasts in terms of cognitive bias such as optimism (Kahneman & Tversky, 1979), which explains the cognitive tendency of one to view events of the future to be more positive than real experience. On the contrary, a political-economic perspective describes forecasting inaccuracies in terms of strategic misrepresentation. Strategic misrepresentation (Flyvbjerg et al., 2002; Flyvbjerg et al., 2005; Wachs, 1989, 1990) tells project managers and forecasters overvalue the potential benefits and undervalue the costs of their projects to get their projects financed from the funding agencies. Flyvbjerg (2006) further explains that both optimism and strategic misrepresentation are in actual deception. Though both the biases have a varying explanation, resultant is same, i.e., inaccuracies in forecasts and exaggerated results of cost-benefit analyses. Likewise, explanations of inaccuracies in forecasts due to cognitive bias has more legitimacy in circumstances when organizational and political pressures are absent, whereas, strategic misrepresentation bias hold more legitimacy in situations where organizational and political pressure are high.

Methodology

The data collection and analysis in this report uses an inductive approach to understand the risks and causes of overruns in mega-projects in Pakistan. This section gives brief details of the method used to collect data and analysis. Since this study aims to explore risks inherent in various phases of megaprojects, i.e., planning and development and execution of different stages of megaprojects in Pakistan, it seems appropriate to adopt a behavioral approach to have deep understandings of subjective thoughts of public sector officials, construction firms/contractors and consulting agencies. This study adopted broad qualitative approach (Symon & Cassell, 2012; Yin, 2015, 2017), because quantitative studies have limitations of lacking subjective thoughts and perspective of respondents, about the phenomenon of overruns in projects. Therefore, in order to explore causes of overruns of megaprojects of infrastructure development, this study investigates in-depth public sector officials from Planning and Development Commission, Finance Division, Pakistan, and those of the largest project owner of roads network in Pakistan. Officials of the largest owner of roads-infrastructure seemed appropriate participants from an organization, which is the largest operator and its network comprises of 47 national highways, motorways, expressways, and roads of strategic importance (Finance-Division, 2019) that accounts for circa 75% of commercial traffic in Pakistan. It is the largest owner and developer of transportation projects and is engaged in 38 on-going projects with an allocated budget of PKR176,636.80 million in 2018-19. It also works based on Build-Operate-Transfer (Mukherjee et al.) and Public-Private Partnership (PPP) with other owners of transportation projects in Pakistan. A screening questionnaire was used to identify potential participants in the study. A copy of the screening questionnaire is given in the Appendix – I.

Participants of the study were working at senior/ executive positions in three target organizations, and who must have significant experience of engagement with megaprojects and could have better insights. In the early stages of the data collection, a diverse sample had been contacted to match the fact that current literature has examined megaprojects, owners,

Policy Journal of Social Science Review
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Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

and contractors, along with consulting firms. Therefore, this study started with convenience sampling in the beginning and then adopted a purposive sampling strategy (Patton, 2002). All the participants were stationed at Islamabad/ Rawalpindi area of Pakistan and represented three main partners involved in megaprojects of Federal Government.

Data collection

Primary research conducted in this study followed the standard process of semi-structured interviews (Brinkmann & Kvale, 2015) in an attempt to explore perspectives on the causes of overruns of projects (Patton, 2002). In order to explore unforeseen data and reduced influence of the researcher, open-ended questions were developed to make an interview guide. A copy of the interview guide is given in Appendix – III. All the participants were assured of maintaining the interview data confidential, and written consent was obtained for the recording of the interviews. A copy of the informed consent is given in Appendix – II. All the participants of the study approached were happy to contribute to this study. In this study, most of the interviews were conducted at the interviewee's office at their convenient time; while some of the interviews were conducted through telephonic discussion. It was especially when interviewers were engaged in some other region. Overall, ten interviews were conducted, involving three senior executives from the Planning and Development Commission, three representatives from the Ministry of Finance, and four respondents from project owners. In this study, all the interviewees were identified after asking screening questions to identify respondents who have remained involved in planning/ overseeing/ supporting project management team in an infrastructure development megaproject in last ten to twenty years. All the interviewees in this study were male having an average work experience of 17 years engaging with megaproject while working for their respective organization.

The interview cum discussion meeting lasted in the range from 25 – 45 minutes duration. All the interviews started with an explanation of the study, and informed consent was obtained from the interviewees. After getting informed consent, all the interviews were audio-recorded. Audio recordings were then transcribed for analysis. Transcription resulted in a document containing eighteen-thousand ninety-two (18,092) words. A coding structure was developed to protect the identity of the interviews, i.e., by removing real names or personal identification data from the transcription used for analysis.

Data Analysis

Transcribed data of recorded interviews were transferred to software for analysis using NVivo. The broad analytical method in this study adopted the process of template analysis, using a hierarchy of codes that represented the themes in the data. The analysis started with the coding of the transcribed interviews, and all the interviews were coded into general themes identified from the literature and the insights in the transcriptions. A copy of the final coding template is given in Appendix – IV.

The Case

This study adopts a thematic analysis approach that is typically used in qualitative investigations. Thematic analysis is a method of categorizing, unifying, and conveying meanings to patterns seen systematically from the data (Rice & Ezzy, 1999). A coding structure was used to uphold the anonymity of the interviewees; no real names or personal identification data were used in the analysis. The first part of the code represents the participant number, and the second part describes the companies they are working. The third part of the code represents the role of the participant in supervising megaproject/s, in our case D for one who has worked as Director in managing megaproject/s.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

Similarly, the fourth part represents the experience of handling megaprojects. For instance, person one from MOPDR with 20 years' experience is coded as P1MD20. Demographics of the participants of this study are given in Table – IV.

Table IV: ***Demographics of Participants of The Study***

Person	Company	Role in megaproject	Age group Years	Experience years	Interview transcription word-count
P1MD21	MOPDR	Director	31-50	21	1743
P2MDD16	MOPDR	Deputy Director	31-50	16	1745
P3MD29	MOPDR	Director	50+	29	1760
P4FD18	Finance Ministry	Director	31-50	18	1806
P5FD19	Finance Ministry	Director	31-50	19	1773
P6FD23	Finance Ministry	Director	31-50	23	1875
P7HD17	Highway authority	Director	31-50	17	1818
P8HD26	Highway authority	Director	50+	26	1790
P9HD19	Highway authority	Director	31-50	19	1901
P10HDD13	Highway authority	Deputy Director	31-50	13	1881
10 persons	3 companies			20.1 years average experience in handling mega-projects	18,092 total word-count

At the beginning of the study, hierarchical codes are developed from the literature. The initial analysis uses these codes and identifies basic themes and ideas from reading the literature on overruns in megaprojects. After importing transcribed interviews in NVivo, initial analysis observes different patterns that used to enhance the coding by using basic themes and concepts identified from the transcripts into an ordinal structure by following the guidelines of Charmaz and Belgrave (2012). After the initial analysis, the hierarchical coding scheme is revised given the identified patterns in the data set. The analysis of patterns in the transcripts reveals themes and sub-themes. Afterward, the same process was carried out to group all similar topics of discussion under one major group. Transcriptions were reviewed to ensure fitting of each data item in the respective node. It was an iterative process and led to frequent movement between developed nodes and transcripts. A coding scheme was revised, and it led refining themes identified in the beginning after the initial analysis. Appendix – IV outlines the final coding structure followed in the analysis of data. Analysis of data revealed that there is considerable understanding of the dynamics of the megaprojects; however, little focus is given to factors that give rise to overruns in megaprojects in Pakistan. Most frequent words used by the participants are; process, plan, risk, cost, schedule, local conditions, change

Policy Journal of Social Science Review
Online ISSN 3006-4635
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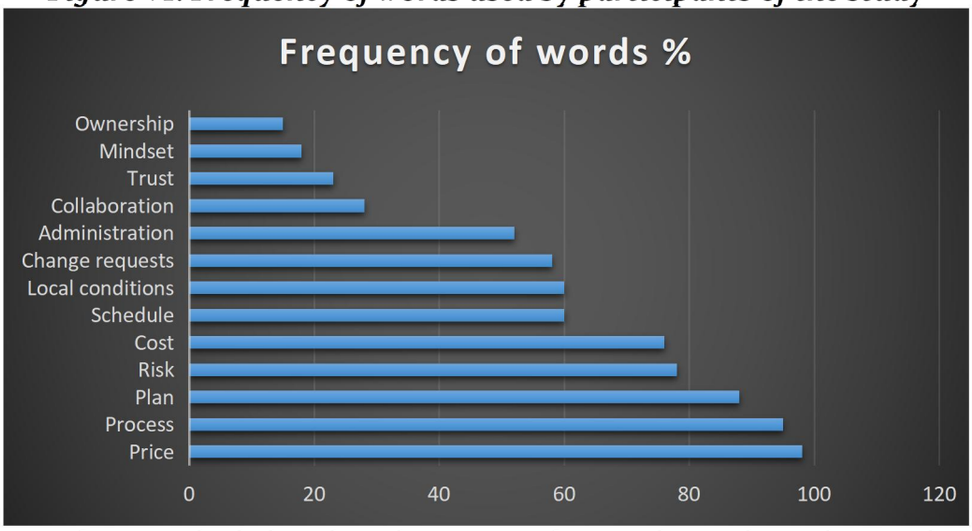
Vol. 3 No. 9 (2025)

requests, administration, collaboration, trust, mindset, and ownership. Frequency chart of the most frequently used words in the data set is given in Figure – VI.

Figure VI: Frequency of words used by participants of the study



The analysis of transcribed data based on most frequently used words reveals important underlying reasons that cause overruns in megaprojects in Pakistan. Of these reasons, price becomes the most frequently used word that has a multifaceted impact. Starting from the inception of the project, in order to sell the project to the senior management or Government officials, planners tend to set the price of the project low to sell the concept of the project projecting it to be a viable option. Price plays its role during negotiation with the contractor/ construction firm, as during these discussions, owners ask for lowering the price of the contract as otherwise the contract will be awarded to some other company. Price reductions made on this type of arguments without carrying out the essential work reductions lead a megaproject to cost overruns in the very initial stages of the project. These problems also arise because of the optimistic planning and forecasting of price fluctuations ignoring the inefficiencies due to poor management at the owner, contractor, and the utility companies end. Price is also of importance if market conditions are considered optimistically overlooking fluctuations in inflation and foreign exchange.

Repetitive usage of the word process in data reveals many aspects. It is of significance since the beginning of the project at the time of selecting a contractor. Acceptance of least price bids does not assure maximum value. Pakistani public-sector owners with limitations of capabilities of evaluating competitive bids award contracts to lowest-bidding companies, thereby achieving a value-based procurement become a challenge. It validates the finding of Khan and Khan (2015). Process of handing over the site to the contractor also important as it is crucial for the contractor to set up initial phases of the construction projects. Process of making payments to the contractor for completed work also of significance as any delays would lead to overruns in the project. Process of acquisition of land and relocation of utilities is important because any poor management or delays would directly have an impact on the completion of the megaproject.

Similarly, repetitive use of the plan highlights the third major cause that contributes to project delays. Most commonly, an appropriate representation of the owner's requirements and project plan to achieve those are mapped with utmost technical input. However, any errors in the plan lead to mistakes in the project and corrective measures later on to correct the mistakes cause overruns in cost and time. Similarly, project plans with little investigation of

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

the site would have potential errors, because, such plans would require additional work, modifications in the scope of the work and might need revisions in the contract itself, which eventually lead to delays in the projects. Poor site investigations, mistakes in designs and specifications, any changes requested by the owners also add to overruns caused by poor project plans. Risks associated with the projects are related with the site condition, probability of natural disasters, risks of the working environment at the site, and particularly security conditions at the site for project and workers at the site.

Optimistic estimations of costs of the projects and emphasis on lowering the bids to contractors is another important factor which causes delays in the megaprojects in Pakistan. It is also an important factor in negotiating project details while selecting a contractor as any errors in estimations of procuring materials will seriously hamper the timely completion of the project. Also, any requests for change by the owners adds to costs of the project and consequently lead to overruns of projects.

Words of local conditions and schedule highlight the significance of local conditions at the site of the project. Planning and scheduling by the owner for carrying out various activities to handover the project site to the contractor are pivotal in the completion of the project. Any poor planning seriously impacts the efficiencies of the contractor to follow the project plan. Here contract management system for timely payments to the contractor also gains importance as any late payments would reduce the efficiencies of the contractor. Whereas, local conditions at the site help contractors plan and schedule various activities of the project according to the project plan. These conditions range from site condition to security of project and personnel through the probability of natural disasters, the supply of material and workforce, etc. Residence and social security of the workers at the site become challenging when local conditions are rugged.

Processes adopted and plan of the project is directly associated with change requests. Change requests by the owners/ consultants of the projects in Pakistan are also considered significant as they cause delays in projects. Any design errors or mistakes in the project plan necessitate change requests in design or order. These lead to wrong construction or application of techniques to achieve the results of projects. Therefore, any change requests are problematic in implementation, require sufficient time for corrections of any mistake due to old/ poor design, and need investigation and review of the progress of various phases of projects. These requests for changes also create issues in effective project management and control.

Administration of various activities in different phases of the projects is also important to about half of the time when evaluating projects' development in Pakistan. These cover assessment of local conditions at the site, the way change requests in the project plan are made and implemented as part of the revised project plan, handling of lawsuits/ disputes especially while acquiring land, other resources, and when utilities are relocated from the site of the project. Here, priorities of successive Governments also become important as these may change due to multiple factors related to the political direction of the Government. In case of differing priorities of Governments, complete administration of various activities may get reviewed, which impacts the progress of the project. Also, collaboration among various public sector institutions is of vital importance to handle disputes/ lawsuits in the acquisition of land and other resources, relocation of utilities, providing alternate routes/ scheduled supply of utilities for residents, etc. The project management team must take into account the role of collaboration among various public sector offices to make management and controlling of a project according to the requirements of the owners/ clients.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

Trust among project owners, contractors, and client/ user agency is also highlighted by some of the participants. Trust among these stakeholders is important because handling the complexities of the project would be easier for the project management team. Numerous factors contribute to complexities in a project such as the size of the project, implementation period, and with these other associated factors include but not limited to the initial budget allocated to the project, and changes in inflation and foreign exchange. Similarly, trust is also important due to the diversity of stakeholders with varying interest and longer chains of communication channel that slow down feedback. Hence, the integration of interests of stakeholders might require a lot of time and resources, and any ignorance has the potential of triggering conflicts and disputes. Here, the experience of various stakeholders working together helps in building mutual trust.

The mindset of different stakeholders helps in planning and scheduling of megaproject and executing the implementation of various phases of within limits of budget and time estimated. Therefore, contractual agreements should spell out minute details of the work-break-down structure, and assessment criteria agreed upon to measure the implementation of the project. Finally, ownership of the project tells a lot about how to proceed for the development of a project by the contractor. Since contractors in Pakistan consider public sector offices with more legal and administrative influence in the Government are considered to be in a better position to assess the development and completion of projects. It is especially important in the last closeout phases of the project may drag out certain activities of any change orders made in the last phases and handing over the completed project to the owner. Owner's vigilance at this stage of the project reduces the idle time and decommissioning of the contractor. For example, any delays in payments to the contractors and suppliers after completion of the project may lead to conflicts and disputes and would eventually cause unnecessary delays in the project even after completion.

Findings

This section details the outcomes of the analysis of transcribed data linked with the research objectives of the study. The analysis helps to explore the major causes of megaproject overruns in Pakistan through the subjective thoughts of the participants. Analysis of the data revealed that the prime reason for delays in megaprojects in Pakistan is the financial constraints that lead to several other steps, which contribute to delays in projects while planning and executing megaprojects. For instance, selection of contractors based on lowest bids offered. Similarly, lowest bid offering company try to reduce its project management costs through materials, personnel hired, machinery and equipment employed, etc. Also, country's economic performance causes difficulties in getting its projects financed by international funding agencies.

The analysis of the data set reveals that effectiveness of project plan has the centrality of the degree of finishing of precontract configuration, missteps, and inconsistencies in structure documentation, customer-initiated varieties of changes in design, plan changes, and buildability issues in the development period of the undertaking. Comment of a participant highlights it;

> *... the major focus is always given to modification in design in to have less cost of total project....many of the design elements are have problems in construction leading to errors or mistakes....(P7HD17)*

It is a well-established fact that clear understanding of the project structure at the contractor side enables contractual workers to reasonably assess the expenses of development and consequently conceivable outcomes for less variety in resulting stages of the project. It

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

validates the findings of Akinci and Fischer (1998) that missteps and error in structure documentation normally trigger the varieties and henceforth are a noteworthy wellspring of cost increments for the two customers and temporary workers. Also, Akintoye (2000) and Iyer and Jha (2005) asserted the critical nature of client-initiated varieties, plan changes, and intricacy in on-location development over cost overruns has been upheld by research. Given that the skills of the consultants hired in structure effectiveness additionally relies upon customers' steady inputs (e.g., customer started varieties) on plan determination, powerful administration of this factor depends on the joint duty of the two customers and experts in the task. As one of the participants reiterated;

> *...the consulting firms' capacity to comprehend the clients' desires and give a reasonable plan at the actor stage assumes a noteworthy job in accomplishing proficient structure results.... (P9HD19)*

Among the causative variables identified, the elements of administrative reasons, design, planning and scheduling related, and technical reasons as prime reasons that trigger differences in understanding of clients and contractors. Moreover, "Lack of Funds" and "Poor Financial Projection on the Client Side" are ranked top indirect causes of the conflicts due to delay in payments of the completed work to contractors to be the most critical factors causing cost and time overruns. Many of the participants see the cost escalation of materials related reasons to have minimal effect on cost increment and postponements of the whole project.

Among the main factors identified, exact project planning and scheduling fundamentally underline the specialized competence of the undertaking group regarding clear comprehension of the task scope, the advancement of the fitting proclamation of work, practical estimation of action length, and gauge making arrangements for controlling and checking over the execution phase of the undertaking. Participant (P3MD29) told *...choice of contemporary strategies and procedures that comparable the intricacy of on-location development exercises is of most extreme significance in overseeing undertaking cost overwhelms...* Also, *...the effectiveness of project manager in observing and controlling the standard venture relies upon powerful revealing and input forms... (P1MD21).* This finding describes a unique move of accentuate of a portion of the basic variables uncovered by past research, for example, complex nature of the project Akintoye (2000), augmentation of material costs (Enshassi, Al-Najjar, & Kumaraswamy, 2009), and contractual worker's money related trouble (Frimpong et al., 2003). Nonetheless, this discovering underpins the affirmation that enormous cost overruns are ordinarily observed as indications of wastefulness in most projects initiated by public sector offices (Flyvbjerg et al., 2004).

Participants from contractors also identified "absence of sufficient planning results into time overruns, guarantee for extension of time, change requests, and additional costs." This finding validates work of Haseeb et al. (2011) that planning is a huge stage wherein all partners have a huge task to carry out. However, Han et al. (2009) consider site the executives itself a significant issue which warrants tireless thought. It also causes wasteful site activities like rework, wastage, changes in orders, errors in design and problems in construction. Similarly, participants working with contractor also claimed;

> *...in my experience, we are paid not according to the phases completed but according to the availability of the funds... (P10HDD13)*

These delays in payments contractors to make late payments to sub-contractors and staff working with contractors and compel temporary stoppages of work at the site. It has also been highlighted by Haseeb et al. (2011) who state that most of the calendar deferrals or plunges emerge out of client's activities, for example, poor budgetary course of action, slow in basic

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 9 (2025)

leadership, and absence of cozy inclusion in arranging. Furthermore Han et al. (2009) consider the absence of cutting edge approach and innovation in planning and scheduling and developing strategies also obstruct the advancement of the task radically.

Data also revealed that frequent changes in the design lead to modifications in the scope of the project. It additionally involves revamps, scrap, change orders, structure mistakes, and constructability issues. Therefore, any time overruns will legitimately impact cost overruns. This finding further validates arguments of Alinaitwe, Apolot, and Tindiwensi (2013) that ordinarily there are five noteworthy reasons for time overruns in any project which are; degree updates, delays in advancement installments, swapping scale changes, poor site the executives and lack of assets.

Participants from the contractor side also identified "slow decision making at client impacts the understanding of the project and various details of the designs." Sambasivan and Soon (2007) reported these by stating that absence of correspondence among essential partners, results into clashes concerning extend philosophies, structures, incorporation of backup the board plans, and constructability issues during the execution stage. Therefore, at the point when such condition wins, at that point configuration engineers, designers and the temporary workers cannot synchronize their endeavors for the regular undertaking objectives. This issue and circumstance get exacerbated when the originators or drafters are vain and unbending in their methodology towards managing temporary workers. They attempt to authorize their very own decision, may it be on the separation points.

Data also revealed that changes are also made to modify the scope of the project to reduce costs due to limitations of funding during the project as well. Participant (P7HD17) told; *...cases have likewise been accounted for when specialists added extra scope to cushion up task cost without the formal endorsement of the customer...* Furthermore, when the project is officially commenced for execution of works, the contractual worker and specialist engage in putting out fires since they possessed not spent enough energy for point by point arranging of the task. Also, a large portion of the revamps in development activities emerge out of timetable deferrals. Kasimu (2012) recommend that this pattern must be wiped out or alleviated if customer and configuration group, facilitate at each stage, deal with the site successfully, improve venture interchanges and embrace present-day acquisitions strategy like just-in-time (JIT) in an all-encompassing way. Further to this, administration of the projects ought to embrace helpful tax collection and open obtainment arrangement through which authority of market powers and value accelerations can be controlled.

Therefore, it can be safely inferred that the Government has a solid task to carry out for the development business. Its arrangements and guidelines have a direct bearing over the exhibition of the development ventures. On the off chance that a market which is controlled and ruled by couple of enormous providers or producers, it will apply crushing impacts on development industry; since they will corner and implement their selling costs and rates. This pattern and practice best prosper under delicate monetary situations as it wins today. The feeble economy is an obstacle towards auspicious consummation of activities in light of deficient finances vital for gaining ground installments and upkeep of money streams. This issue is increased when assessments are high for acquisition of development materials. Even though legislature has received stringent estimates like foundation of Planning Commission of Pakistan and Public Procurement Regulatory Agency (PPRA) yet at the same time there is a great deal of work which should be finished. In this area of survey, most of respondents showed top two causes, i.e., scarcity of assets and deferral in advancement installments,

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 9 (2025)

In the development business of Pakistan, there is a general recognition that advisors (both the plan experts and the planners) appreciate extreme decision and choice power for the constructability issues on the ventures. It is indiscreet to state that contractual workers are the sole elements who are to be accused of deferral, disappointment, or surrender of development ventures.

Also, consultants have direct impact over progress or disappointment of development projects. A participant (P9HD19) told that *...their expert or amateurish activities do lay fortunate or unfortunate repercussions onto the temporary workers and the undertakings alike...* For example, when there will be conflict and struggle among auxiliary, general wellbeing works, electric and water supply drawings with design drawings, a definitive issue will be moved to the temporary worker. He will most likely be unable to execute the drawings because of structure mistakes, absent or deficient information, and absence of a combination of auxiliary plans. Lamentably there is a tremendous correspondence hole among essential partners. That is the reason, certain experts include additional work at their will, to cushion up architect gauges, without the endorsement of the customers or proprietors. This training finishes into clashes among contractual workers, sub temporary workers, customers and the specialists themselves.

The contribution of the client in all periods of the undertaking, for example, the whole project life cycle is required, to make the undertaking a total achievement. Tragically there are individual from causes and reasons, over which the customers do not assume their due job and contribution to the improvement and development of the venture. In the succeeding passages, the creators have portrayed the summary of such factors. Opportune subsidizing on the venture is significant to speed up the advancement according to affirmed development timetable and calendar pattern. Inability to guarantee a smooth income with no conceivable reasons will stop and upset the undertaking force. A large portion of the tasks flop because of interruption in real money streams. Following comment highlight these issues;

> *...legal issues for getting loans from local banks and agencies cause unforeseen delays in time for arranging funds... (P5FD19)*

The undertaking bend takes off all-around quickly during the execution stage, and endeavors ought to be made to keep up, this inspires pattern. The sadly larger part of the customers requests significant changes during this stage. It talks about their degree of the association during arranging stage. Arranging is such a stage where there is a ton of space for real changes, varieties, deviations or increases in the extension yet not in execution stage. These progressions involve substantial uses and claims by temporary worker which over spending plan the cost baselines.

Essentially, customers likewise request additional works, details, and highlights in the venture plan without bringing about extra costs. This conduct is known as "Gold Plating" in the language of Project Management. At the point when this happens, the contractual worker bargains the quality in another field to satisfy the customer while keeping costs to the lower side. Other factors are inappropriate drawings, improper investigation of the site of the project, slow responses to inspection and process of handing over the site to the contractor. A participant (P8HD17) informed;

> *...like consultants, clients, additionally do not stick to the endorsed courses of events and do not favor the change arranges convenient. ...a moderate choice in one action pushes the following action and in this way it turns into a chain response for the undertaking all in all... it is significant to serve the undertaking, that there must be satisfactory assets for upkeep of money streams just as endorsements of important change orders... also*

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 9 (2025)

during arranging, all prerequisites ought to be all around advised without leaving any vagueness, for later stages...

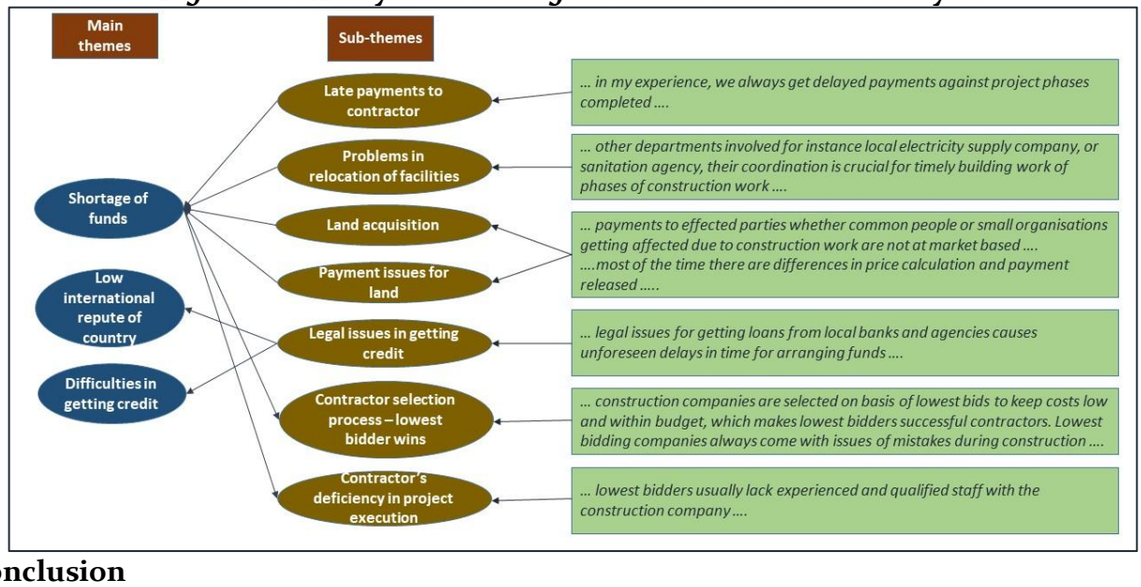
Data of the interviews uncovered that monetary and financial factors, for example, capital supply, money streams, loan costs, and swelling are significant concerns. While capital supply and money streams are inner to an association, financing costs and swelling are outer and are fundamentally administered by government arrangements. All the participants opinioned that clients are in charge of the choice of the task area thinking about the requirements of local people and the needs of the legislature. Whereas, participants form the contractor side considered "clients responsible for guaranteeing the security for the site examination and study of the region, in charge of land securing to control any adjustment in arrangement during execution of the task." Anyway in its nonattendance every one of extra costs must be borne by the client. The speedy effect undertakings are completed to win hearts and psyches of the neighborhood populace to pick up their consistent help. Consequently, any extra cost brought about to do these activities must be overseen by the proprietor. Although customer will most likely be unable to guarantee total harmony and concordance among the clans yet in the event of any contention between these clans.

Postponements in payments by the Government is cited as one of the most significant reasons by participants in addition to "Task begins without legitimate site examination." Postponed installment by customer (Delays in handing over of site by the Government) is positioned third most significant, slow handling at Govt. offices, poor monetary arranging came about into deferred installments which thus further postponed the tasks. These delays in payments put contractors and subcontractors in difficult situation add to constraints in managing the finance of the respective projects. It is also due to problems in arranging finance by the Government either from national sources or from international funding agencies due to bad reputation of the country due to financial embezzlement the public sector officials. Slow decision making by the public sector offices also furthers the constraints put on the contractor. Restricted payments to contractor push builder to invest less capital in arranging construction material, with compromises on quality of the material, late supplies of the material to the site and fluctuation in the prices of building material. Contractors are also compelled to hire low waged labor, which comes with lower productivity, higher absenteeism and poor working conditions of workplace safety and security issues at the site of the project. These factors worsen the performance of the contractor in project development of phases of the project concerned. All of these factors explained further validate the findings of (Jamil et al., 2012; R. Masood et al., 2015)

The examination of the data revealed several themes emerging from the data collected. Major themes identified from the analysis of data are a shortage of funds, low international repute of country, and difficulties in getting credit. Major themes and sub-themes recognized from the data are presented in Figure – V.

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

Figure – V: Arrays and coding structure used in the analysis



Conclusion

Megaprojects of infrastructure development play a critical role in the development of an economy. Timely completion of these projects within estimated budget remains a matter of concern that triggered research on these in recent decades. This study was envisaged to identify the major causes of the overruns in Pakistan, which represents a typical case of being a developing economy of the world. In Pakistan, federal and provincial Government initiate and owns megaprojects because of massive amount of capital investment involved. The author adopted a qualitative approach to study underlying phenomena that cause delays in megaprojects. For this purpose participants from MOPDR, Finance Ministry and highway authority had been approached for data collection on subjective opinions of individuals. Analysis of the data revealed that prime reasons for failures of megaprojects in Pakistan problems of available funds and getting finance from donor agencies due to international repute of the country.

Overruns of costs in mega construction projects of highway authority have turned out to be routine because of conflicting arrangements, deficiency of assets, security reasons, debasement and hardheaded ineptitude with respect to temporary workers in order to reduce costs against very low approved budget. Poor planning of the project by major partners in the project for example client, contractor and consultant prompts a high task cost in contrast with the genuine expense. Generally projects are granted to the temporary workers without complete ownership of the site in the beginning because of deferred land obtaining process. Insufficient site examination in the underlying stage likewise impacts the cost of the project significantly. There is a requirement to guarantee ownership of the complete undertaking site before letter of acknowledgment is issued to contractual workers. Greater expense ought to be assigned for examination of ground conditions with gifted labor assets so commonsense rates might be set in the beginning for execution.

Repeated changes requested in the design and scope of the project lead to frequent changes on phases of the project. It also involves rework in many of the completed phases/ sections of the projects. In addition, cost heightening on significant development materials/ price change contributes much to expanding the expense of an interstate venture. This expansion in expense is owing to be paid by the customer as per standards of Pakistan Engineering Council (PEC, 2009). The extra cost because of high acceleration on costs

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

significant development materials repays the development contractual workers by utilizing value change equation. Arrangement of possibilities in the agreement report by virtue of value accelerations might be given with the goal that a higher venture cost might be distributed which will be less inclined to minor departure from higher side.

Similarly, the award of the contract to the lowest bidder contributes to the delays in project completion. As majority of the contracts are awarded to the lowest bid offering contractor, which is proven malpractice in construction industries around the world. It affects the process of competitive bidding and escalates the whole process of project development because lowest bidders are unable to put additional resources to the projects to keep costs lower and maximize profits at their end. It consequently leads to problems of delays and changes requests by the clients further add to complexities of the projects, which also cause mistakes in projects with frequent reworks at various phases.

Recommendation

On the basis of findings of the study it is strongly recommended that Government should consider inherent weakness of lowest bid system. It could be addressed by having a mechanism of assuring quality of the project at the time of award of the contract that can guarantee quality aspects of the project during execution. Flexibility in the system of awarding the contract may also be added viewing the project. Adding multiple parameters in addition to the cost of the project in the bidding process may result in better outcomes of project implementation when compared with lowest bidding process especially if the non-lowest bidding contractor fulfils multiple criteria of the award of the contract.

Future research

The future research might be carried out with larger sample size to investigate the causes of delays in projects in other sectors of the economy to validate and have more generalizable findings. Also, it is suggested that further investigation should be done on case studies basis in view of findings of this study to compare the outcomes of the project following process of lowest-bid award and lump-sum amount to have further insight. Similarly, future research might also be done to study multiple criteria contract awarding system in infrastructure development projects.

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Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 9 (2025)

Appendix – I

Screening questions
Location:
Date:

Research introduction:
We are researching with officials involved in planning, financing, and executing infrastructure development projects in Pakistan. We feel that you might be interested in discussing 25 – 30 minutes duration. (Interviewer to mark appropriate responses of the participants)
Can you answer a few questions to make sure you meet the criteria for our research?

Name			
Age	~ 30 years	31 – 50 years	50+ years
Gender	Female	Male	

Are you currently working?

Planning & Development	Finance Ministry	Highway authority
Other		

Were you involved in big projects of infrastructure development?

Directed megaproject	Partly directed megaproject	Assisted megaproject Director/ Team	Other factors
Number of project/s			

Your contact details;
Address:

Contact number:
E-mail:
Your name:
Signature:

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 9 (2025)

Appendix – II

CONSENT FORM FOR AN INTERVIEW

University of Oxford

BT Centre for Major Programme Management, Said Business School

Project: Megaproject overruns in Pakistan: Who is to blame?

Dear Participant,

You are invited to participate in a research study on "Megaprojects in Pakistan: Who is to blame?" This study is part of the coursework of MSc at the University Of Oxford, UK.

Your participation in this research project is completely voluntary. There are no known risks to participation. If you agree to participate in this project, it will involve an interview of 30 – 45 minutes duration. Neither your name nor any other information of identity will be associated with the audio recording or the transcript. Only the research team will be able to listen (view) to the recording, and responses will be used in aggregate form. Overall, your responses will remain confidential and anonymous.

If you have any questions about this project, feel free to contact me at ***e-mail;***

Thank you for your input in this important endeavor.

Participant Name: _____ Signature: _____ Date: _____

Researcher name: _____ Signature: _____ Date: _____

Policy Journal of Social Science Review

Online ISSN 3006-4635

Print ISSN 3006-4627

Vol. 3 No. 9 (2025)

Appendix – III

Depth-interview Guide

Introduction

- Introduce yourself, and your university
- Explain the purpose of the research and how the views of participants will be used
- Explain that;
  - You will not attribute discussion/ comments to individuals
  - All the information/ discussion will remain anonymous
  - Participation is voluntary
  - Be honest – there is no need to construct an explanation
- Explain how the discussion will be recorded
- Get the informed consent form signed by the participant

Questions

1. Share your experience of involvement in megaprojects?
2. Have the projects you were involved in, adequate funding to ensure continuous operations?
3. How do you think that the money allocated to megaprojects/ estimated costs of individual activities appropriate to keep all parts of the project executable?
4. How did you ensure that all the phases of the project become operational according to the plan?
5. In your opinion, what are key performance indicators of the assessment of megaprojects of infrastructure development?
6. How often you assessed key performance indicators to determine project was within planned time and budget?
7. What do you think should be done to make all projects follow the project plan?
8. How often you have to coordinate with the officials of the planning and development commission/ finance ministry/ local administration/ consultant firm?
   a. Why? What do you feel?
   b. If not, why not?
9. What measures you think should be incorporated into the project plan to avoid the catastrophic impact of natural disaster, considering the site of the project? Alternatively, if there are any tribal rifts or security issues.
   a. How does it affect the project plan?
   b. How does it could be prevented to do the project according to plan?
10. Were you aware of the site conditions before at the time of site handover to contractor/ construction firm?
    a. Does it affect your management of site?
    b. How? Moreover, why?
11. Please explain the criteria used for the selection of the contractor/ consulting firm?
    a. How does it make any difference in project execution?
12. What do you think about the responsibility of the Government to ensure completion of projects within time and budget?
    a. What factors do you think to impede completion of project phases within time and budget?
    b. How do you feel about these factors?
    c. Can these be eliminated? How?

Policy Journal of Social Science Review
Online ISSN 3006-4635
Print ISSN 3006-4627
Vol. 3 No. 9 (2025)

d. Who is primarily responsible for taking care of projects? Why?

13. How can the Government improve working on megaprojects of infrastructure development?
    a. Why?
14. What do you think about any mechanism of complaint/ problem reporting? Alternatively, resolution of the issues?
15. What measures could be taken to minimize the impact of natural disasters?
    a. Are these practical? When resources, and budget are considered.
    b. How frequently are these measures considered?

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Appendix – IV

Coding structure

Final coding scheme planned for this study follows the format;

- Higher-level code
  - Lower-level code

Coding scheme;

- Design
  - Process
    - Time estimation
    - Costs estimation
    - Acquisition of land and other resources
    - Contractor selection procedure
    - Handing over site to contractor
    - Payment schedule
    - Project development assessment
    - Collaboration for relocation of utilities
  - Risk
    - Natural disasters
    - Security conditions at site
  - Schedule
- Costs
  - Change requests
  - Risk due to price increase
  - Fluctuation in foreign exchange
  - Acquisition of materials
- Administration
  - Local conditions assessment
  - Change requests in design/ orders
  - Handling of disputes/lawsuits
  - Priorities of Government
  - Policies of Government

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Appendix – V

Identification of sub-themes and major themes from data

Analysis of the transcribed data revealed various factors that contribute to delays in infrastructure projects. Participants see availability of limited funds for the projects as the major issue that further influences several other aspects related to the projects towards the delays in completion of work break down structure. The analysis helped identify restricted funds also compel public offices to opt for lowest bid offering contractor for award of the contract of the project. Major sub-themes revealed from the examination of transcribed data are problems in land acquisition and payment issues for land, problems in relocation of facilities from project site, late payments to contractor for completed work, issues in getting credit from local and international agencies, and lowest bid award system for contractor selection as it leads to selection of contractor with limited capacity of project execution. These factors could be grouped into prime themes of overruns in Pakistani megaprojects as scarcity of funds, difficulties of arranging finance by internal borrowing, and from international sources due to bad reputation of the country.