

FACTORS CAUSING DELAYS AND COST OVERRUNS IN CONSTRUCTION PROJECTS IN PAKISTAN

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Abstract

Delays and cost overruns are common problems in construction projects in Pakistan, especially in public-sector and infrastructure projects. These problems affect project owners, contractors, consultants, users, and the wider economy because delayed projects usually require extra funds, create disputes, and reduce public confidence. Previous studies show that Pakistani construction projects face repeated issues such as inconsistent cash flow, late payments, poor project management, design changes, legal and land acquisition problems, inflation, material shortages, weak labour productivity, and poor coordination among stakeholders. One study of 65 construction projects in Pakistan found that 74% suffered cost overrun and 97% suffered delay, with an average cost overrun of 28.27% and an average delay of 2.1 years. This paper discusses the major factors causing delays and cost overruns in Pakistani construction projects and suggests practical measures for improvement.

1. INTRODUCTION

The construction industry plays an important role in Pakistan's economic development because it supports infrastructure, housing, transportation, energy, and public facilities. The sector contributes significantly to employment generation, urban development, and national investment activities. Roads, bridges, highways, dams, residential schemes, commercial buildings, and public infrastructure projects are all closely linked with the country's social and economic growth. However, despite its importance, the construction industry in Pakistan continues to face serious challenges related to project delays and cost overruns. Many projects fail to finish within the planned time and approved budget, particularly in

the public sector, where delays can affect taxpayers, public service delivery, and government credibility. Research on Pakistani construction projects has repeatedly shown that delays and cost overruns are not caused by one single factor. Instead, they usually result from a combination of financial, technical, managerial, contractual, legal, and external issues working together. Weak financing systems, poor project planning, inaccurate cost estimation, slow decision-making, design modifications, and shortages of materials or skilled labour often create a chain reaction that affects the overall project schedule and budget. In many cases, one unresolved issue leads to several additional problems, increasing both project duration and total construction cost.

Delays and cost overruns in Pakistan's construction projects generally emerge across the full project life cycle, beginning from feasibility studies and design stages to procurement, execution, supervision, and final delivery[1], [2]. Common causes identified in previous studies include delayed release of funds, inflation and price escalation, poor coordination among stakeholders, weak scheduling and monitoring systems, variation orders, approval delays, contractor inexperience, equipment shortages, and political or security-related challenges. External conditions such as weather, economic instability, government regulations, and legal disputes further increase project uncertainty. The overall pattern suggests that projects suffer when clients, contractors, consultants, and government agencies fail to align effectively on financial planning, communication, decision-making, and risk management. Several researchers have highlighted the seriousness of this issue in Pakistan. A major study by Nadir and Ahmed reported that only 7 out of 65 selected construction projects were completed within the original budget, while only 2 projects were completed according to the planned schedule. The same study found that approximately 90% of projects experienced cost variation and 97% faced delays[3]. These findings indicate that delays and cost overruns are not isolated or occasional problems in Pakistan's construction sector; rather, they represent deep structural and managerial weaknesses that require stronger planning, monitoring, governance, and coordination mechanisms.

Previous literature also suggests that financial problems remain one of the most critical reasons behind poor project performance in Pakistan. Delayed payments, weak contractor financing,

inflation, fluctuating material prices, and inconsistent cash flow can significantly reduce work progress and increase project expenses. Similarly, poor project management practices, unrealistic schedules, weak supervision, and low contractor capability often reduce productivity and increase the risk of rework and disputes. Design-related issues, including incomplete drawings, scope changes, and approval delays, further contribute to time overruns and additional costs. Moreover, legal and external conditions continue to create difficulties for many public infrastructure projects in Pakistan[4], [5]. Land acquisition disputes, court stay orders, relocation of utilities, political interference, security concerns, and adverse weather conditions can interrupt construction activities and create uncertainty for contractors and investors. At the same time, weak communication and poor coordination among stakeholders often delay approvals, decision-making, and problem resolution, making project management even more difficult.

Therefore, understanding the major causes of delays and cost overruns is important for improving construction project performance in Pakistan. Identifying these factors can help policymakers, contractors, consultants, and project managers develop better strategies for planning, risk management, cost control, and project execution. The main purpose of this paper is to identify and discuss the major factors causing delays and cost overruns in construction projects in Pakistan[6]. The paper also aims to examine how these factors affect project performance and to suggest practical measures that may help improve planning, coordination, financial control, and timely project completion in the Pakistani construction industry.



Figure 1. Challenges in construction projects in Karachi

2. Major Factors Causing Delays and Cost Overruns

2.1 Financial and payment Problems and Inconsistent Cash Flow

Financial problems are one of the strongest causes of delay and cost overrun in Pakistani construction projects. When clients do not release funds on time, contractors struggle to pay workers, buy materials, rent machinery, and maintain site progress. Nadir and Ahmed identified “inconsistent cash flow” as the most significant factor causing delay and cost overrun in their study of Pakistani projects[7].

Across the studies, financial weakness on both the owner/client side and the contractor side appears again and again as a leading source of delay and cost growth. Several papers rank cash-flow problems, financial difficulties, and slow payments among the top causes in Pakistan’s construction industry, with inflation and material-price fluctuation close behind. Ahmed et al. report that cash-flow and financial difficulties were the most common factor, followed by slow payments, inflation, and fluctuation in material prices, and they directly link slow payment flow and inflation in material, labor, and equipment to delay and

cost escalation[7], [8], [9], [10]. Similar results are reported by Khalifa et al., who identify financial problems, slow payments, and inflation as the top-ranked causes of cost escalation[11]. Studies on time overrun also show the same pattern: contractor financial issues are listed among the main causes of delay in building and public projects, along with delayed payment by clients and weak client finances[12], [13], [14], [15], [16], [17], [18], [19]. In highway and other public-sector work, delayed process payments by owners/clients, owner financial difficulties, and delayed release of funds are repeatedly tied to cost overrun and time slippage[20], [21], [22]. Other studies reinforce that progress-payment delays and weak contractor financing are often seen by owners and contractors as the most critical delay drivers, while poor financial capability, delayed bill payment, and trouble obtaining project finance can directly turn delays into cost overrun[23], [24], [25], [26], [27]. This helps explain why financial issues are often grouped with inflationary effects, political pressures, and weak fund availability: once payment is late, contractors may slow work, struggle to procure materials, face higher prices later, and lose schedule control[2], [17], [28], [29],

[30], [31], [32], [33]. This issue is particularly serious in public projects because payments may be delayed due to bureaucratic procedures, budget approval problems, or political changes. Once cash flow is disturbed, work slows down, subcontractors become inactive, and the project schedule begins to slip. Later, the same delay increases project costs through inflation, idle labour, equipment charges, and claims.

2.2 Poor Project Planning and Management

Poor planning is another major reason why projects exceed their time and cost limits. Many projects begin without detailed scheduling,

realistic cost estimation, risk planning, or proper resource allocation. Idrees and Shafiq found that poor project management was one of the major causes of time overrun in public-sector construction projects in Pakistan[3], [12], [23], [34], [35], [36], [37], [38], [39]. Weak management also creates problems during execution. For example, if site activities are not properly coordinated, one team may wait for another to complete its work. Similarly, poor supervision can lead to rework, low productivity, and mistakes. In many cases, the original project plan looks acceptable on paper, but it does not reflect actual site conditions, market prices, or approval delays.

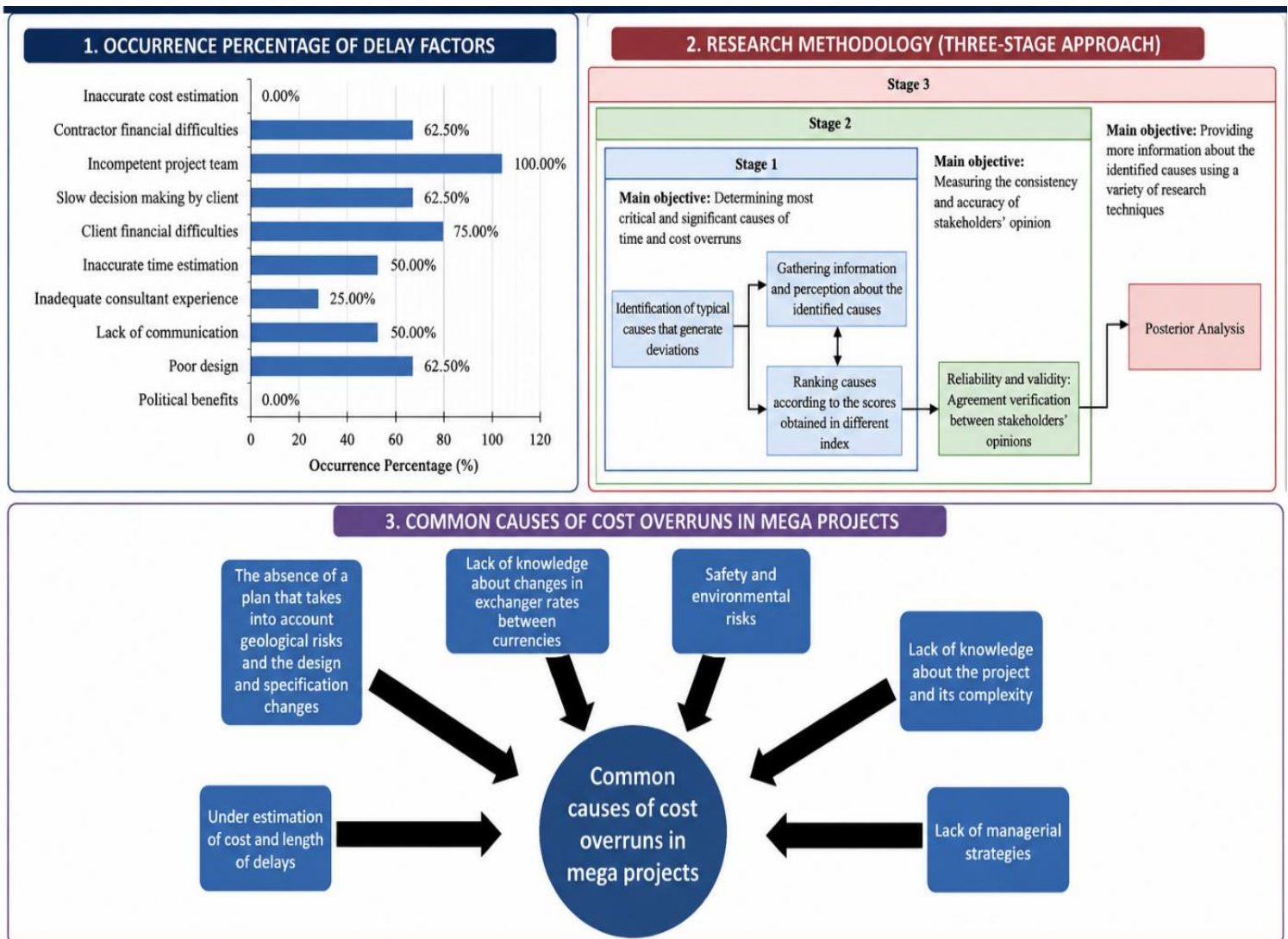


Figure 2. Key factors causing delays and cost overruns in construction projects.

Weak planning and weak project management are major reasons construction projects in Pakistan run late and cost more. The same pattern shows up across studies: bad estimates, poor scheduling, weak supervision, low contractor experience, and poor contract or decision management make even normal project problems much harder to control. A large share of delays and overruns in Pakistan starts before site work is fully underway, when time, cost, and resources are estimated poorly and project plans are weak. Multiple studies identify inaccurate cost and time estimates, errors in time estimation, and poor start-up planning as key drivers of both delay and cost growth, because projects begin with unrealistic durations, budgets, and work sequencing[40]. This connects closely with findings on improper feasibility work, weak data collection and surveying before design, and poor planning during different project phases, all of which can lock in bad assumptions early and create rework, disputes, and later budget pressure[3]. Project management quality itself is another recurring issue. Studies on public and private projects point to inadequate planning and scheduling, poor project management, ineffective project management, poor site management and supervision, weak monitoring and control, and slow information flow between parties as major causes of time overrun and cost escalation[6]. In practice, this means work is not sequenced well, site problems are not caught early, and teams react

late when scope, materials, or approvals change. The capability of the contractor and the wider project team also matters a lot. Inexperienced contractors, incompetent subcontractors, poor professional construction management, unsuitable construction methods, and weak resource management are all linked to overruns in Pakistan's projects[3], [21], [22]. Several studies also point to poor contract management, weak coordination among stakeholders, and delayed decision-making by clients as factors that turn ordinary project complexity into schedule slippage and added cost, especially in public and highway projects[13]. Bidding and procurement choices can also create later overrun risk. Some studies highlight awarding work at the lowest bid price, bidding at unrealistically low rates, errors at the bidding stage, and old procurement procedures as causes that weaken delivery from the start, often by pushing underqualified firms into projects or by creating budgets that do not match actual execution needs[1], [7], [11]. Taken together, the evidence suggests that planning and management failures are not just separate causes; they are force multipliers. When estimates are wrong, planning is weak, contracts are managed poorly, and decisions move slowly, projects become less able to absorb normal shocks such as price changes, design issues, or supply delays, so time overruns and cost overruns rise together[4], [41].



Figure 3. Main challenges in projects

2.3 Design Changes and Technical Errors

Design-related problems are a common cause of delay and extra cost. These include incomplete drawings, errors in design, changes in specifications, and poor coordination between consultants and contractors. Idrees and Shafiq reported that technical errors, including low-quality drawings, rework, and bidding-stage errors, were major causes of time overrun in Pakistani public projects[12], [34].

When drawings are unclear or incomplete, contractors may stop work until clarification is received. Sometimes completed work must be removed and rebuilt because of revised drawings or mistakes. This increases labour cost, material wastage, and project duration. Design changes

made by owners during construction are especially damaging because they disturb procurement, sequencing, and cost control. Design problems and scope changes are a major reason projects in Pakistan run late and cost more. When drawings are wrong, incomplete, or approved late, work often stops, gets redone, or expands beyond the original plan. A clear pattern across the literature is that design quality matters a lot. Errors and mistakes in design and drawings, poor or improper design, low-quality drawings, and design delays are repeatedly linked to both delay and cost overrun because they create rework, confusion on site, and weak cost control from the start. Several studies also rank design mistakes and frequent design changes among the most significant drivers of time

overrun in Pakistan's public projects, showing that this is not just a minor technical issue but a repeated delivery problem. Recent work further reinforces this pattern by identifying design error changes and variation orders as some of the most critical overrun factors in Pakistani infrastructure projects[42].

Scope growth is another common cause. Studies describe increase in scope of work, extra work orders, additional work, and change or variation orders as direct causes of higher cost and longer duration, especially when they arise after execution is underway. In highway and public-sector projects, change in project scope is also tied to owner or client interference and delayed decision-making, which can expand work without giving the project team enough time, money, or clarity to adjust properly[28]. Approvals and administrative clearances are a third part of the same problem chain. Delays in approval of drawings, delay in approvals, belated approval and finalization of drawings, and even belated final assessment by third parties are all identified as

important delay factors in Pakistan[24]. Bureaucracy and corruption are also cited as major reasons projects fail or overrun, which suggests that some approval delays come not only from technical review but also from slow administrative systems [6]. This fits with broader findings that delayed decision-making by clients, slow information flow between parties, and owner interference make it harder to freeze designs, issue instructions, and keep site work moving. These design and approval issues often overlap with legal and site-access problems. In public projects, court stay orders, land acquisition, relocation of public facilities, and delay in handing over the site can all force redesign, resequencing, or scope revision, which then adds both time and cost. Overall, the evidence suggests that once drawings are weak, changes are frequent, and approvals are slow, projects lose stability: crews wait, completed work may need to be redone, procurement plans become less reliable, and costs rise as the schedule stretches.

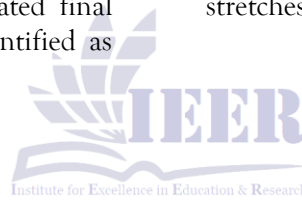




Figure 4. Main seven challenges in projects.

2.4 Material Price Escalation and Inflation

Construction projects in Pakistan are highly affected by changes in the prices of cement, steel, fuel, bricks, electrical items, and imported

materials. Recent studies on construction cost and time overrun in Pakistan identify inflation and rising material prices as major causes of cost overrun. The problem becomes worse when

projects are delayed. A project planned at one price level may be executed months or years later at much higher rates. Contractors may then demand price adjustments, reduce work speed, or compromise on quality. In long-duration infrastructure projects, price escalation can become one of the largest sources of budget increase. Site work in Pakistan often slows down because key inputs do not arrive on time or are not available in the right quality or quantity. Material shortages, weak procurement, lack of skilled labor, equipment cost and maintenance problems, and poor labor or subcontractor management all push projects toward both delay and cost overrun. Another strong pattern in the literature is that construction projects in Pakistan often struggle with basic production inputs: materials, labor, equipment, and the systems used to move and manage them. Delays in supply of materials, late delivery of materials, shortage of materials, and delay in material procurement are all repeatedly identified as important causes of time overrun, while shortages of construction materials in the market can make the problem worse by stopping or slowing work even when plans are otherwise ready. These supply problems also feed directly into cost growth, since studies on cost overrun link shortage of materials, fluctuation in material prices, and price increase in materials to higher final costs, especially when delays force contractors to buy later at worse prices[3], [4], [22], [41].

Labor constraints show a similar pattern. A shortage of skilled labor is repeatedly listed as a major delay factor, and more recent summaries also describe weak human-resource capacity as a serious problem in Pakistan's construction sector[3], [12], [41]. The problem is not only the number of workers, but also how labor is managed: poor management of labor, poor site management, inexperienced staff, and disputes or weak performance among subcontractors can reduce productivity and make delays harder to recover once work falls behind. Equipment is another recurring bottleneck. Studies point to the availability and functioning of equipment, shortage of equipment, and especially the high cost of machinery and its maintenance as important causes of both time and cost

overrun[43]. When machinery is unavailable, unreliable, or too costly to operate and maintain, contractors can lose output on site and may shift to less efficient methods, which then adds both time and expense. Taken together, these studies suggest that supply-chain and resource constraints in Pakistan are not just isolated site problems. They interact with weak procurement, contractor inexperience, poor coordination, and price volatility, so a delay in one input, such as steel, equipment, or skilled labor, can quickly spread across the schedule and turn into a broader cost overrun problem[6], [44].

2.5 Late Delivery and Shortage of Materials

Material shortage and late delivery also delay construction work. Soomro et al. identified late delivery of material as one of the main causes of time overrun in building projects in Pakistan. Material delays may occur because of poor procurement planning, supplier failure, transport problems, import restrictions, price changes, or cash flow difficulties. When key materials do not reach the site on time, workers and machinery may remain idle. This not only delays the project but also increases indirect costs. Poor material planning also creates quality risks because contractors may purchase alternative materials in a hurry.

2.6 Labour Shortage and Low Skill Level

Construction projects depend heavily on skilled labour, including masons, steel fixers, carpenters, electricians, plumbers, machine operators, and supervisors. Research on Pakistani building projects identifies shortage of skilled labour as a main cause of time overrun. Another recent study also lists labour shortages among key contributors to time overrun in Pakistan.

Low labour skill affects productivity and quality. Work may take longer than planned, and mistakes may require rework. In some cases, contractors hire inexperienced labour to reduce costs, but this may increase the final cost of the project because poor workmanship leads to defects, delays, and supervision problems.

2.7 Contractor Inexperience and Weak Subcontractor Performance

Contractor experience is important for managing complex construction activities. Soomro et al. found that contractor inexperience and incompetent subcontractors were among the main causes of time overrun in Pakistani building projects. An inexperienced contractor may underestimate project complexity, submit unrealistic bids, fail to manage resources, or lack the financial strength to continue work during payment delays. Subcontractors can also become a weak point when they lack technical capacity or fail to meet deadlines. Since many construction activities are interdependent, one weak subcontractor can delay several other activities.

2.8 Legal Issues, Land Acquisition, and Public Facility Relocation

Legal and administrative problems are especially important in public-sector projects. Idrees and Shafiq found that legal issues such as court stay orders, land acquisition, and relocation of public facilities were the leading causes of time overrun in public projects in Pakistan.

These problems often arise before or during construction. For example, if land is not fully acquired before the project starts, contractors may not get access to the complete site. Similarly, relocation of electricity lines, gas pipelines, water supply systems, and public utilities can take longer than expected. Court cases and local resistance may stop work completely, causing major delays and extra cost.

2.8.1 External, legal, political, and environmental conditions

Many delays and cost overruns in Pakistan come from outside the project team's direct control. Legal disputes, land and site-access problems, political and bureaucratic interference, security risks, bad weather, natural disasters, and wider economic instability can all stop work, stretch schedules, and raise costs. Across the literature, external conditions are a major part of why projects in Pakistan run late and cost more, especially in public and infrastructure work. Several studies point to law-and-order problems,

war and terrorism, political and bureaucratic influence, and economic instability as top delay drivers, showing that projects are often exposed to risks far beyond day-to-day site management. Political issues also appear in newer work on mega and public projects, where political approach, owner interference, administrative issues, and changes in government policies are linked to both time overrun and cost growth. Bureaucracy and corruption are also identified as important reasons projects fail or overrun, which suggests that delays are often reinforced by slow or distorted public decision systems rather than by technical problems alone[3], [6], [24].

Legal and site-access barriers are another repeated source of delay. In public projects, court stay orders, land acquisition, relocation of public facilities, disputes over land usage, and delay in handing over the site are all reported as major causes of time overrun, and they often also increase cost by forcing idle time, resequencing, and claims. Recent synthesis work groups these issues under legal, administrative, governance, and environmental risk categories, which fits the broader pattern that delays often begin with access, approvals, and institutional constraints before construction can proceed smoothly. Weather and natural hazards are also common triggers. Studies on mega projects, regional construction projects, and broader delay reviews all identify weather effects such as heat, snowfall, rain, flood, and earthquake as important causes of schedule slippage and cost increase, with some work describing natural disaster as one of the most common delay factors in Pakistan[6], [24]. In practice, severe weather and disasters can damage works, reduce labor productivity, block transport routes, and suspend activities altogether, especially in exposed regions.

A final external layer is macroeconomic pressure. Inflation, local-currency weakness, escalation in material prices, and wider economic conditions are repeatedly linked to both delay and budget overrun, because even when work is technically feasible, unstable prices can make budgets obsolete and slow procurement or execution (Ahmed et al., 2018)(Gardezi et al., 2014)(Adedokun et al., 2025)(Akal et al., 2017). This is why external risk

in Pakistan is best seen as more than background context: legal constraints can block access, political conditions can slow decisions, insecurity can halt work, weather can damage progress, and economic instability can make every delay more expensive.

2.9 Poor Communication and Coordination

Construction projects involve many stakeholders: clients, consultants, contractors, subcontractors, suppliers, government departments, and local communities. Poor communication between these parties creates delays in decision-making, approvals, inspections, and problem-solving. A study on construction project delays found that information and communication-related factors were among the most important challenges affecting time overrun.

In Pakistan, coordination problems may appear in the form of late instructions, unclear responsibilities, slow approval of drawings, weak site meetings, and poor documentation. When communication is weak, small issues remain unresolved until they become serious delays.

2.10 Weather and External Conditions

Weather is not always the most severe factor, but it still affects construction progress, especially in road, bridge, drainage, and large infrastructure projects. Soomro et al. listed weather impacts among the main causes of time overrun in building projects in Pakistan. Heavy rain, floods, extreme heat, and site access problems can slow work and damage materials or temporary works. External conditions such as political instability, security concerns, strikes, regulatory changes, and supply-chain disruption may also affect construction performance. These factors are difficult to control, but better risk planning can reduce their impact.

2.11 Cross-cutting effects and stakeholder perspectives

In Pakistan, delays and cost overruns often spread across the whole project rather than staying in one area. Different stakeholders also see the causes differently, which can make it harder to agree on fixes and respond early.

A final pattern across the studies is that delay factors tend to interact and produce wider project failure, not just a few extra days on the schedule. Rashid finds that delay causes are mainly linked to contractor, client, consultant, material, and equipment issues, and that the effects can extend beyond time overrun and cost overrun to project abandonment and litigation (Rashid, 2020). This matters because many of the causes discussed earlier, such as weak finance, poor planning, design changes, and supply problems, do not stay isolated; once one party falls behind, the effects can move through contracts, payments, procurement, and site work and become disputes or claims[5]. The literature also shows that clients, contractors, and consultants do not always rank the same problems in the same way. Sohu et al. report that these stakeholders have different perceptions of the critical factors behind cost overrun, which helps explain why projects may struggle to build a shared response even when all parties agree that performance is poor (Sohu et al., 2021). In practical terms, a client may focus on contractor weakness, a contractor may focus on late payments or approvals, and a consultant may focus on design or supervision gaps; if those views are not aligned, corrective action can be slow or incomplete[22]. This is why coordination and contract management show up as cross-cutting needs rather than narrow technical fixes. Memon et al. identify resource management as the top critical factor and note that contract management issues also contribute strongly to cost overrun, recommending an effective contract management protocol among stakeholders through design and supervision to improve cost performance and reduce time overrun[3]. Afzaal et al. similarly show how one problem can trigger another: slow progress payments and difficulty obtaining finance create delays, and those delays then turn into cost overruns[1]. Taken together, these studies suggest that the biggest risk in Pakistan's construction projects is often not a single cause, but the weak alignment between stakeholders on money, responsibilities, decisions, and contract control, which allows routine problems to grow into major delay and overrun outcomes[1], [3], [22]

3. Effects of Delays and Cost Overruns

Delays and cost overruns have serious consequences. First, they increase the final project cost because of inflation, extended site overheads, machinery idle time, and claims. Second, they create disputes between clients, contractors, and consultants. Third, they reduce the quality of construction when contractors try to recover losses by cutting corners. Fourth, they delay public

benefits, such as roads, schools, hospitals, housing, and transport facilities.

In public projects, these problems also damage trust in government spending. As Idrees and Shafiq explain, delays and cost overruns in public projects can create criticism because public money is involved and the completed facility is meant to serve the general population.



Figure 5. Solutions of construction Projects in Pakistan

4. Conclusion

Delays and cost overruns in Pakistani construction projects are caused by a combination of financial, managerial, technical, legal, labour, material, and external factors. The most serious issues include inconsistent cash flow, poor planning, design errors, inflation, late material delivery, shortage of skilled labour, contractor inexperience, legal disputes, land acquisition problems, and weak coordination. The evidence suggests that these are not isolated problems; they are repeated patterns in the construction sector. To improve project

performance, Pakistan’s construction industry needs stronger planning before execution, better financial control, clearer designs, skilled project teams, timely payments, and more transparent monitoring systems. Without these improvements, many projects may continue to suffer from the same cycle of delay, cost increase, dispute, and reduced public value.

5. Recommendations

To reduce delays and cost overruns in Pakistani construction projects, the following measures are recommended:

1. **Improve financial planning and payment systems.** Clients should ensure timely fund release, and contractors should prepare realistic cash flow plans before work begins.
2. **Complete design before construction.** Drawings, specifications, bills of quantities, and site investigations should be properly checked before tendering.
3. **Use realistic cost estimation.** Estimates should include inflation, price escalation, market uncertainty, and contingency allowances.
4. **Strengthen project monitoring.** Tools such as earned value management, progress reporting, and regular site audits can help detect delay and cost problems early. Nadir and Ahmed also discussed earned value analysis as a monitoring tool for identifying project delay and cost overrun.
5. **Resolve land and legal issues before project execution.** Public-sector projects should not begin until land acquisition, utility relocation, and major approvals are substantially completed.
6. **Improve contractor selection.** Contractors should be selected not only on the lowest bid but also on experience, financial capacity, technical staff, equipment, and past performance.
7. **Develop skilled labour.** Training programmes for construction workers and supervisors can improve productivity and reduce rework.
8. **Improve communication.** Regular coordination meetings, clear documentation, digital reporting, and faster approval systems can reduce misunderstandings among stakeholders.

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