

## **PROBLEMS OF PROJECTS AND EFFECTS OF DELAYS IN THE CONSTRUCTION INDUSTRY OF PAKISTAN**

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### **ABSTRACT**

*The problem of project delays is a fact that occurs mostly in construction industry of Pakistan. Delays are always measured as expensive to all parties concerned in the projects and very often it will result in clash, claims, total desertion and much difficult for the feasibility and it slows the growth of construction sector. For analyzing the causes of delay, an appraisal on construction project's time performance was conducted. The main objective of this study is the identification of factors of delay and their effects on the success and completion of project. The most common factor of delay are natural disaster in Pakistan like flood and earthquake and some others like financial and payment problems, improper planning, poor site management, insufficient experience, shortage of materials and equipment etc. This paper covers the delay factors and causes of delay and some suggestion for reducing these delays in large construction projects in Pakistan.*

**Keywords:** *Construction delays, Causes of delays, Effects of delay, construction projects, Pakistan*

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### **INTRODUCTION**

The construction delay is a universal evident reality not only in Pakistan however all the countries faced this global fact [1]. Construction delay can be defined as execute later than intended planned, or particular period, or letter than specific time that all the concerned parties agreed for construction project [13]. Delay in project is counted as a common problem in construction projects [25]. On large level there is no suspicion that the development of country depends upon its achievement of its advance plain with elevated construction contents [8]. There is a French dictum "when the construction industry prospers everything prospers". Escalation of construction industry is of imperative for all regions of national and international economy, as well as everyone involved in the industry like contractors, workers, financiers, architects, engineers etc [22]. The project's success depends on meeting objectives within time and budget limits [2]. Tools and techniques play important role in project management [10]. The major factor of construction problems is project's delay [23]. Delay means loss of income according to and for the owner or client. In case of contractor, delay refers to the higher costs due to longer work time, labor cost increase and higher fabrication costs. On time completion of project is an indicator of efficiency. But there are many unpredictable factors and variables resulting from various sources affecting construction projects. Some main sources are the involvement and performance of parties, contractual relations, environmental and site conditions, resources availability etc [7, 23]. It is very rare to see that a construction project is completed on time [3, 4, 11, 24, and 26]. In this study, e discussed most critical factors causing delay in large construction projects in Pakistan.

**PREVIOUS STUDIES**

The contractor and the owner pay for the extra charge for the completion of the project due to delay in large construction projects. When the completion time of the construction project exceeds the agreed completion time, it is known as construction project delay (International journal of project management). The causes of project delays fluctuate according to and due to the faults and weaknesses of the owner and the contractor. It is needed to conduct detailed investigation and identification of delay factors and then selecting the right actions to counter these delay factors within cost and maintaining quality [3,4,5,11,16,17,24,25,26,30]. The faults and errors due to the contractor cause delays and waste of capital and time [6,28]. Shortage and incompetent workers and employees are due to the imprecise staff projections [20,21]. Delay can occur due to the incapability of the contractor of project and properly use the capital.

**RESEARCH METHODOLOGY**

The review of related works was done first and then the opinions and views of construction experts were taken. The questionnaire survey was done on the behalf of the delay causes. There were two parts of the questionnaire, Part A Par B. Part A asked about the respondent’s personal information, whether he is client, consultant, contractor, subcontractor etc and how much work experiences the respond is, what type of association in which he is working, how much monthly salary of him etc. Part B asked about the information related to causes and factors of delay in large construction projects of Pakistan. A survey was conducted through mailed two hundred questionnaire were distributed in Government, private and semi Government organization out of which one hundred and twenty were given response and in some organization, I had taken interviews vocally by the labors of private firms. The respondents were asked about the grading and scoring of the causes and factors of delay. After the analysis of these, the recommendations were made to counter these problems.

The grading and scoring of delay factors relevant to clients is shown in the table below.

**Table 1. Delay Factors relevant to Clients**

S.No	Causes of delay in large construction projects	% of people agreed	% of people not agreed
1	Economic ability/ Economically arrangement for the project	100	-
2	Previous working relationship	70	30
3	Category (Public, Private)	70	30
4	Main concern construction time	90	10
5	Specified sequence of completion	70	30
6	Possible changes to initial design	60	40
7	Unclear perception of demand	70	30
8	Not definite about material	80	20
9	Not property time decision	90	10
10	Late payment of bills	80	20

After the grading and scoring, the most important factor relevant to clients is economic ability and economic arrangement for the project, on which 100 % respondents agreed.

The grading and scoring of delay factors relevant to consultants is shown in the table below.

**Table 2. Delay Factors relevant to Consultants**

S.No	Causes of delay in large construction projects	% of people agreed	% of people not agreed
1	Completeness and timeliness of project information	80	20
2	Build ability of design	70	30
3	Provision for ease of communication	60	40
4	Previous working relationships	70	30
5	Priority on construction time	80	20
6	Missing some detail in drawing	80	20
7	Not completely understand the client requirements	70	30

After the grading and scoring, the most important factors relevant to consultants are completeness and timeliness of project information, priority on construction time and missing of some details in drawings, on which 80 % respondents agreed.

The grading and scoring of delay factors relevant to contractors is shown in the table below.

**Table 3. Delay Factors relevant to Contractors**

S.No	Causes of delay in large construction projects	% of people agreed	% of people not agreed
1	Material used in construction	60	40
2	Lack of acquiring new equipments	70	30
3	Unfair relationship subcontractor with employees	60	40

After the grading and scoring, the most important factor relevant to contractors is lack of acquiring new equipments, on which 70 % respondents agreed. The grading and scoring of delay factors relevant to contract form is shown in the table below.

**Table 4. Delay Factors relevant to Contract Form**

S.No	Causes of delay in large construction projects	% of people agreed	% of people not agreed
1	Suitability to project time	80	20
2	Use of standard form of contract	70	30

After the grading and scoring, the most important factor relevant to contract form is suitability to project time, on which 80 % respondents agreed. The grading and scoring of delay factors relevant to labor is shown in the table below.

**Table 5. Delay Factors relevant to Labor**

S.No	Causes of delay in large construction projects	% of people agreed	% of people not agreed
1	Nationality of labors	70	30
2	Labors personal conflict	60	40
3	Low productivity level of work	70	30
4	Shortage of labors	60	40
5	Injuries of labors	60	40

After the grading and scoring, the most important factors relevant to consultants are nationality of labor and low productivity level of work, on which 70 % respondents agreed. The grading and scoring of delay factors relevant to project conditions is shown in the table below.

**Table 6. Delay Factors relevant to Project Conditions**

S.No	Causes of delay in large construction projects	% of people agreed	% of people not agreed
1	Function or end use (Office, residential industrial)	60	40
2	Complexity	60	40
3	Location	70	30

After the grading and scoring, the most important factor relevant to contract form is location, on which 70 % respondents agreed. The grading and scoring of external delay factors is shown in the table below.

**Table 7. External Delay Factors**

S.No	Causes of delay in large construction projects	% of people agreed	% of people not agreed
1	Statutory undertakes ( gas, water, etc)	60	40
2	Regulations	70	30
3	Weather	60	40
4	Natural disasters (earthquake, flood, etc)	60	40
5	Rain	60	40
6	Changes in government regulation and laws	70	30
7	Effects of subsurface conditions	70	30

After the grading and scoring, the most important factors relevant to consultants are regulations, effects of subsurface conditions and changes in government regulations and laws, on which 70 % respondents agreed.

**IDENTIFICATION OF CRITICAL DELAY FACTORS**

The significant delay factors are obtainable in Table 2-7. Each table organizes each group of factors relevant to clients, consultant, contractor and external delay factors are rated on a scale of 1 to 10. The significance rating for each factor was scored on a scale of 1 to 10 with 1 having the lowly importance and 10 the uppermost importance. The numbers in the filled cells for significance evaluation indicate the mean and mode values of responses for that alternative.

Questionnaire takes a survey and obtained rating against each cause of delay due to client from the respondent. Here in table mean value is the average value of the collected data against cause and mode is the greatest value among the value collected against each cause and critical index denoted how much significance of each cause produced delay.

**CRITICALLY ASSESSMENT CRITERIA OF DELAY**

The delay factors are assessed by the critical assessment criteria. The table 8 shows the assessment criteria such as mean delay factor range, mode and critical index.

**Table 8. Critical Assessment Criteria**

S.NO	Mean delay factor range	Mode	Critical index
1	1.5 – 2.5	Slightest significant towards project delay	1
2	>2.5 – 5.0	Moldy significant towards project delay	2
3	>5.0 – 7.5	Moderately significant towards project delay	3
4	>7.5 – 10.0	Most significant towards project delay	4

**DELAY FACTORS RELEVANT TO CLIENTS**

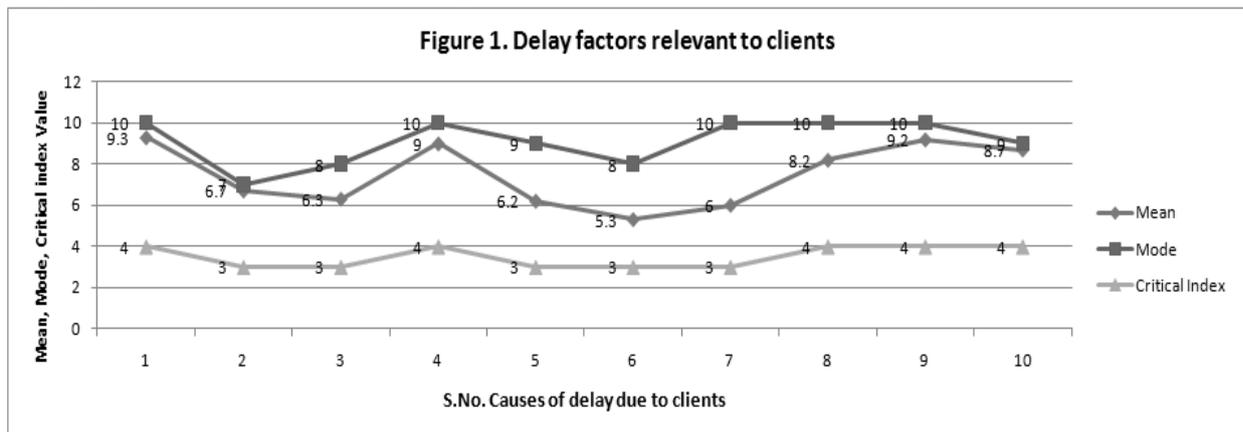
The critical assessment criteria of delay factors relevant to clients are shown in table and figure below.

**Table 9. Delay Factors relevant to clients**

S. No	Causes of delay due to clients	Mean	Mode	Critical Index
1	Financial ability/ financial arrangement for the project	9.3	10	4
2	Previous working relationship	6.7	7	3
3	Category (Public, Private)	6.3	8	3
4	Priority on construction time	9	10	4
5	Specified sequence of completion	6.2	9	3
6	Possible changes to initial design	5.3	8	3
7	Unclear perception of demand	6.0	10	3
8	Not definite about material	8.2	10	4
9	Not properly time decision	9.2	10	4
10	Late payment of bills	8.7	9	4

The most important causes due to clients with the critical index 4 are priority on construction time, not definite about material, not properly time decision, late payment of bills and financial ability/financial arrangement for the project.

The graph below shows the criteria of delay factors due to the clients.



**DELAY FACTORS RELATIVE TO CONSULTANT**

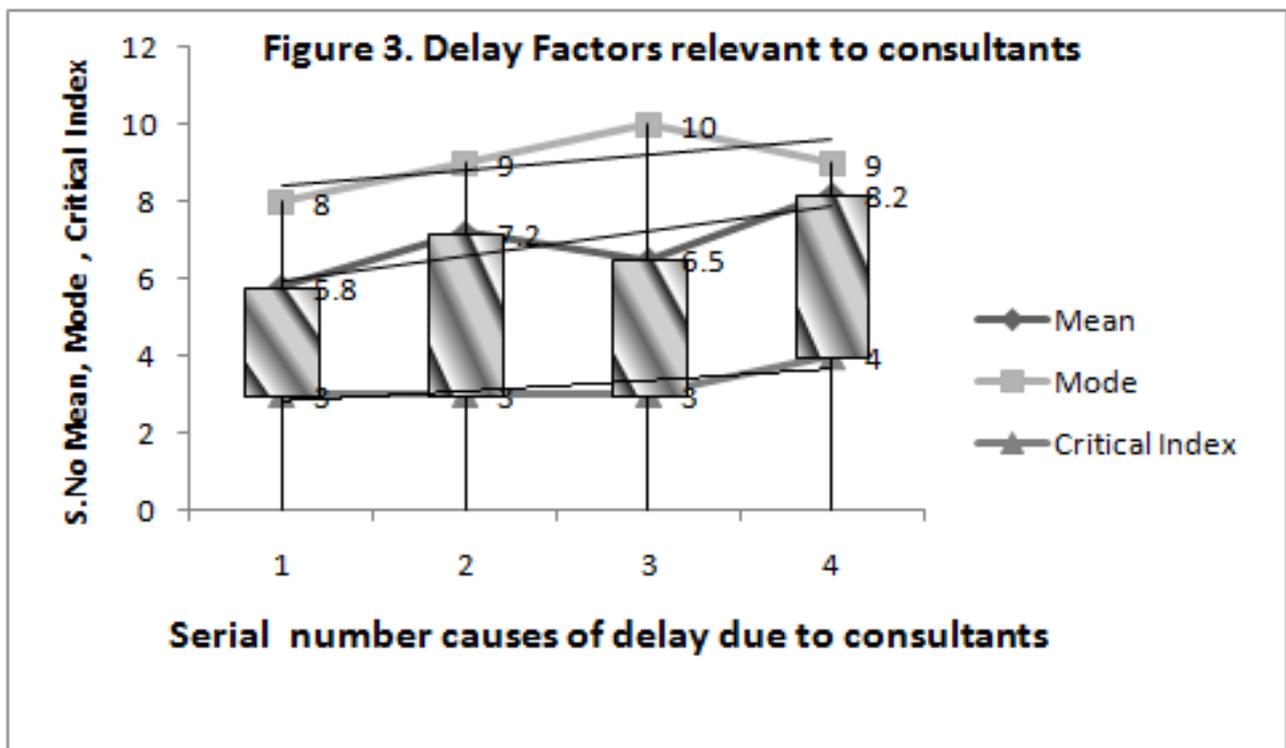
The critical assessment criteria of delay factors relevant to consultants are shown in table and figure below.

**Table 10. Delay Factors relevant to consultants**

S.No	Causes of delay due to consultant	Mean	Mode	Critical Index
1	Completeness and time lines of project knowledge	8.2	10	4
2	Build-ability of design	7.3	8	3
3	Stipulation for ease of communication	6.8	9	3
4	Preceding working relationships	7.7	10	4
5	Priority on construction time	9.2	10	4
6	Missing some feature in drawing	8.5	9	4
7	Not completely understand the client necessities	6.2	8	3

The most important causes due to consultants with the critical index 4 are preceding working relationships, priority on construction time, missing some feature in drawing and completeness/timeliness of project knowledge.

The graph below shows the criteria of delay factors due to the consultants.



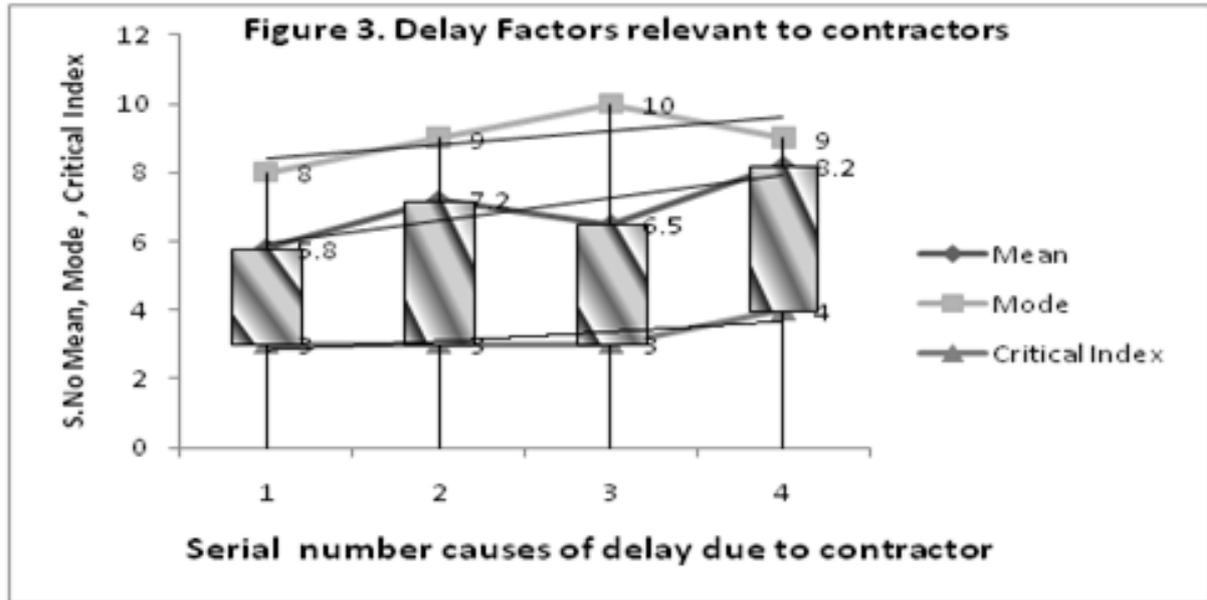
**DELAY FACTORS RELEVANT TO CONTRACTOR**

The critical assessment criteria of delay factors relevant to contractors are shown in table and figure below.

**Table 11. Delay Factors relevant to contractors**

S.No	Causes of delay due to contractor	Mean	Mode	Critical Index
1	Material used in construction	5.8	8	3
2	Lack of acquiring new equipments	7.2	9	3
3	Unbalanced relationship, subcontractor with employees	6.5	10	3
4	Acquire out of data and machinery	8.2	9	4

The most important cause due to contractors with the critical index 4 is acquiring out of data and machinery. The graph below shows the criteria of delay factors due to the contractors.



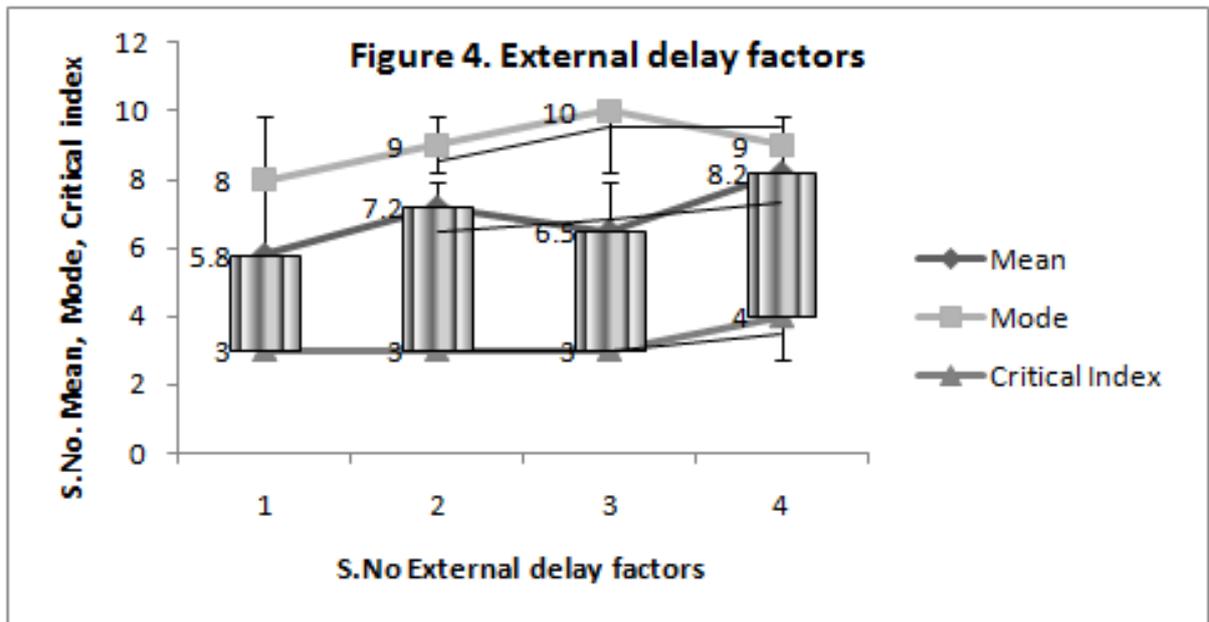
**EXTERNAL DELAY FACTORS**

The critical assessment criteria of external delay factors are shown in table and figure below.

**Table 12. External delay factors**

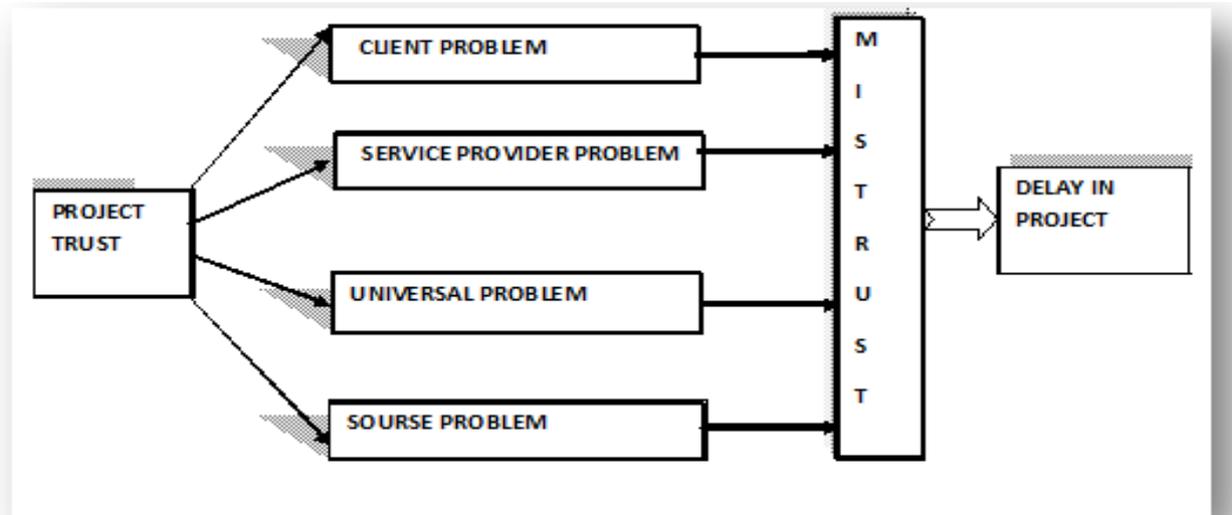
S. No	External delay factors	Mean	Mode	Critical Index
1	Statutory undertakes (water, gas, etc)	5.8	8	3
2	Weather	7.2	9	3
3	Natural disasters (Earthquake, flood, etc)	6.3	8	3
4	Rain	5.7	9	3
5	Changes in government policy and laws	8.3	10	4
6	Effects of subsurface circumstances	6.8	9	3
7	Rules	7.3	8	3

The most important external delay cause with the critical index 4 is changes in government policy and laws. The graph below shows the criteria of external delay factors.



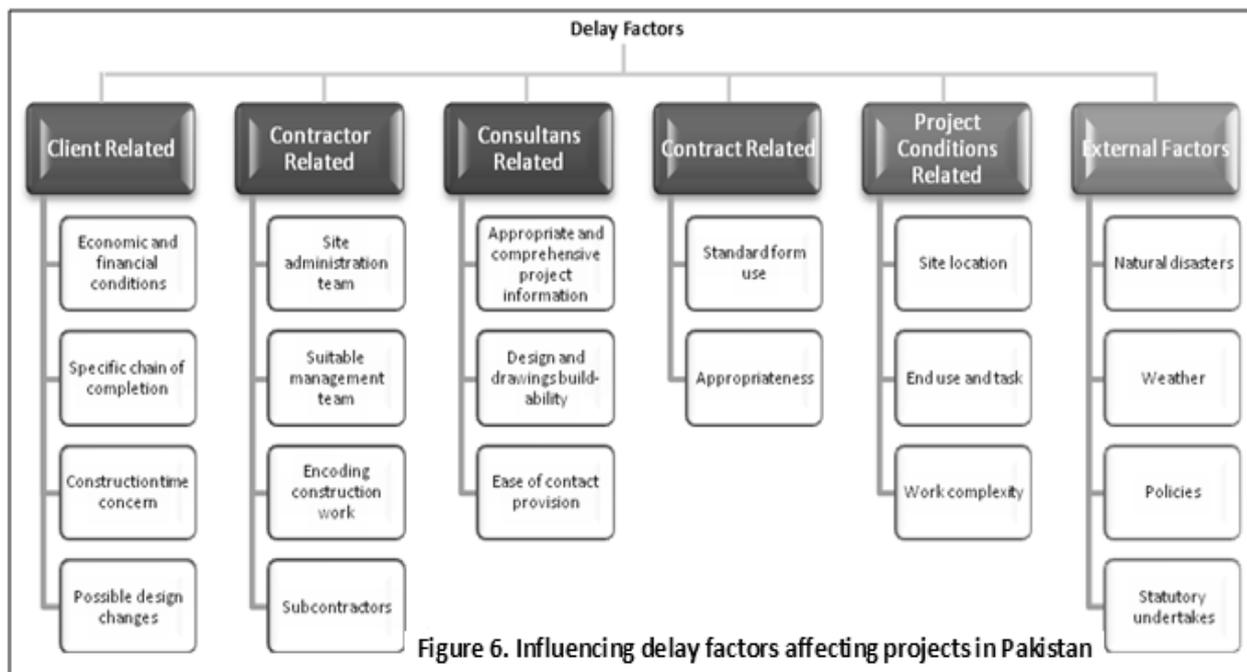
**DELAY FACTORS**

Delays are also caused by some fundamentals and things which go wrong during the construction project. A sign of delay in work is when contractor do not takes care of the schedule. Delay in completion of project is also caused by equipment breakdowns and labor disputes. The major factors due to which delay occur are client problem, service provider problem, sources problem and universal problem.



**Figure 5. . Mistrust Problem**

The client related factors are concerned with client’s type, individuality, experience, financial status, awareness, organization, construction complexity, confidence, extent and risk dealing {13}. The contractor related factors are concerned with the contractor’s cash flow, site management, experience, subcontractors, supervision, information flow and control system. Resource problem are more often related with dealer, late delivery of equipments, deficiency of workers, non efficient equipment use during construction, late delivery of materials, inflation, low quality material etc. General problem which faced during the project are environmental problem, weather problem, ground problem, natural disasters like earthquake, flood etc. The owner makes some changes during the project delaying the project. Construction plans can be changed by change of zoning laws causing the delay. The contractor can stop the work due to late delivery of payments or payments are not on time. The influencing delay factors affecting the construction projects are given below.



**Figure 6. Influencing delay factors affecting projects in Pakistan**

**EFFECTS OF DELAY**

Several factors cause the overall delay in the construction project such as some within contractor’s liability and some are within owner’s liability [18, 19, 31]. It is hard to distinguish due to overlapping nature of the events that which party or parties are responsible and what ingredients of the delay cause. It is mostly seen that delay problems are cause of dispute, negotiation, lawsuit, total desertion, litigation and abandonment. We can say that the parties included in contract through claims agree on the additional capital and extra time linked with construction delay. The consequences of delay are different for different parties. The general consequences are the loss of wealth, time and capacity. For owner, delay means the loss of income and unavailability of facilities. For contractor, delay means the loss of money for extra spending on equipment and materials and hiring the labor and loss of time.



**Figure 7. Effects of delay in construction projects of Pakistan**

**CONCLUSION**

The survey results indicated that the majority of delay factors are relevant to client factor. It is concluded from survey for dipping in delay client must have strong economical ability and financial arrangement for project, correctly time decision. He must give proper time and priority on his construction project and tacking appropriately time verdict. Most factors related to consultant it is due to not understanding the client necessities, not having proper project information, absence of some detail in drawing etc. It is examine from survey due to contractor that mostly delay occur because of deficient in obtaining up-to-date equipments, unwarranted material used in construction. Due to which cause of dispute occur in construction so it is necessary that excellent material is used in construction. Providence of material is also most significant causes due to which delay occur in construction so it is essential that material supply must be in time. From survey it is predicted that some delay occur in projects due to shortage of labors. There may be variation among labors, injuries, and low yield of work. In other factors due to which delay occurs are project conditions like site, complexity, complication in work due to weather. Delay also occurs due to external factor like change in government, regulation and location etc. Client must be mentally and financially strong for starting a new project due to which we can reduce delay in projects.

## RECOMMENDATIONS

To decrease the delay in large construction project following particulars are very significant. It is suggest that vendor must be give imbursement to contractor at time because it is liability of contractor to manage the economic record and due to which work growth is efficient. For decreasing delay in project diminish the change in drawing during the construction. It is necessary for contractor that by increasing number of labors productivity in construction increased. For reducing delay in project contractor must have knowledge about his resources strength and obtain up-to-date Machinery, and try to obtain new equipment for construction. It is contractor liability that he must manage the capital resources throughout the project and use it appropriately because he doesn't countenance economic and cash flow problems. For reducing delay managerial and technical staff should be acquired for site management and supervision. It is necessary to include skilled and experienced workers in staff because of them the performance of work is improved. For completion of project it is necessary that client must be fait on contractor and consultant. In Pakistan mostly delay occur in large construction projects is change of government due to which construction is stopped and new government propose new design for construction as well as bill are not easily passed by new government. We must be use new machinery and getting training and obtaining new ideas of construction from developed countries like China, Japan etc. Electricity is also issue in construction due to which many of hours equipments can't take production and due to which delay occur in large construction in Pakistan.

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