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RESEARCH ARTICLE

CAUSES AND EFFECTS OF PROJECT DELAY IN PUBLIC CONSTRUCTION PROJECTS IN ETHIOPIA

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ABSTRACT

Projects especially public construction projects have a vital role for the economic development of a nation by transforming the living standard of the community. This study aimed to assess the causes and effects of public construction projects in Dessie town. To achieve the objective of the study 128 respondents approached from the clients, contractors and consultants of the ongoing projects of Dessie town. Questionnaires used to collect primary data from the target population. It has both a likert scale and open ended items. The collected data were analyzed using descriptive data analysis techniques along with the relative importance index. The index widely used in similar studies to measure the level of importance and occurrence of delay causes and effects. The findings of the study showed that the causes of delays emanated from clients, contractors, consultants and externals. Furthermore the main responsible stakeholder for delay of projects in Dessie town is clients. In addition the top ranked causes are delay of progress payment by clients, poor communication and coordination by contracting parties, slowness of the decision making process by owners and financial difficulties of stakeholders. Regarding to the effects of delay, time overrun cost overrun, total abandonment, dispute, litigation, poor project quality, negotiation and bad public relation are confirmed. Based on the findings, the study recommends clients the so called public agencies to revise their project management system, improve financial management system and need to ensure regular project monitoring and evaluation. In addition the study also recommends corrupted individuals should be identified and accountable legally.

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INTRODUCTION

According to Msafiri (2015) in projects specifically in the construction industry, the word delay is applied to describe the time overrun of a project beyond the officially agreed completion time due to causes related to the parties involved in the contract namely, client (employer), contractor and the consultant. Similarly Assaf& Al-Hejji (2006), Ahmed et al., (2017), stated delay as the time over run either beyond completion date specified in a contract or beyond the date that the parties agrees upon for delivery of a project as cited by (wei, 2010). There are many factors that contributed to causes of delays in construction projects range from factors inherent in the technology and its management, to those resulting from the physical, social, and financial environment. A study conducted by Symon (2016) on construction projects found in Kenya found out contract administration, finances, design variation and technology were the major causes of delays in the completion of large construction projects in that country. Fugar and Agyakwah (2010) confirmed that project financing, economic and natural material supplies are the major causes of project delays in Ghana.

Another study carried out by Akinsiku and Akinsurile (2012) in Nigeria indicate that some of the factors that influence project delays include poor contractual management, slow or delayed approval processes by project stakeholders change in laws and regulations, poor communications and contractual problems among others. In Ethiopia context some researches undertaken on this issue. For example a study by (Armide, 2018) on 20/80 condominium housing projects in Addis Ababa categorized causes of delay in to three groups such as client related causes includes problem in selection of competent consultants and reliable contractors, absence of good methods and systems in purchasing and finance, slow speed in decision making, poor planning and controlling, lack of leadership skills of project manager, poor coordination and communication with stakeholders, and lack of sense of ownership. The current employment crisis is the result of the cumulative inability to achieve an effective connection between employer expectations and perceptions from the graduates (Ahmed and Tessma, 2020). On the other hand, (Armide, 2018) identified consultant related causes as lack of knowledge and experience, poor management, and difficulty in controlling contractors, poor coordination and communication with the project stakeholders, a slow response regarding testing and

inspection, lack of commitment to confirm construction work according to specification and design. The third category related to the contractor's weakness like lack of experience and technical profession, poor planning and scheduling, Insufficient coordination and communication, lack of leadership quality, less commitment, wastage of resources around the project sites, construction mistakes and defective works. Furthermore, a study on rail and road construction projects of Ethiopia by Yenealem (2018) found out the major causes of delay as incomplete study prior to project approval, poor project management and coordination, right of way issues, inaccurate forecasting of schedule, overconfidence and interest of project stakeholders. According to Ferejo et al., (2022) individuals and their relatives are the main source of finance for the majority of MSEs for two major reasons. These and other few researches done in Ethiopian context in different region indicate the cause of delay in one geographic area is not necessary the same in another area thus, causes are not inclusive and whole tic. There are several causes of delays in construction industry identified by researchers in the field of project management but they may have geographical limitation and cannot be applied directly and this is an indication why there are several researchers on the causes of delays in construction projects from several countries. So, geographic limitation is one gap the researcher identified and this gap clearly indicates the necessity to investigate the real causes of delay in specific district to alleviate the problem. The other gap is most of previous researches focused only assessing causes of delay. But the current study tried to examine both the causes and effects of delay. Based on this fact, the current study focused on both causes and effects of public construction projects in Dessie city administration.

REVIEW OF RELATED LITERATURE

Many definitions have been developed to explain the meaning of a project. Kezner (2000), defined project as any series of activities and tasks that has a specific objective to be completed within certain specification, defined start and dates, funding limits and consumes resources. Psychological traits factors found to be significant in predicting the likelihood of youth considering entrepreneurship as an attractive life (Ahmed, et al., 2022). Whereas (PMI, 2013) defines project a temporary endeavor undertaken to create a unique product, service, or result. In addition, Project is defined as set of interrelated tasks to be executed over a fixed period and other limitations (Business Dictionary, 2019). Among the ten knowledge areas described by PMI (2017), schedule management knowledge area is relevant to the topic of processes involved in achieving on schedule project completion. Delay of project implementation is defined as the late completion of work compared to the planned schedule (Bentator&Thumann, 2003). Delay in any project can be defined as an "act or event which extends required time to perform or complete work of the contract manifests itself as additional days of work" stated by Zack (2003). Emotional recognition detects the human being's thoughts at an instant level (Arora et al., 2022). Today's consumers have more choices for their financial needs than ever before (Buba et al., 2018). Furthermore, Assaf and Al-Hejji (2006) defined construction delay as "the time overrun either beyond completion date specified in a contract, or beyond the date that the parties agreed upon or delivery of a project" (El-Razek1 & Mobarak, 2008). Similarly according Ramanathan et al. (2012), Thomran and Ahmed (2020), in construction industry delay can be defined as the additional time consumed to complete a particular project beyond the originally specified contractual date agreed by the parties to deliver the project (Amarasinghe, 2016). Aibinu and Jagboro (2002) defined the delays in construction as a situation where non completion of a project within the original or stipulated or agreed contract period. Different studies conducted regarding to causes of delays in construction projects specifically in public projects. The study carried out by (Albatsh, 2015) in Palestine construction projects revealed that referral of lowest price bids, incorrect and inappropriate bid pricing, lack of sufficient cash for project implementation, contractor failure to regulate the cash flow of the project and irregular cash flow of the project on owners side are main factors that cause project delay. The study confirmed that an increase in cost, weakness of productivity,

lack of revenue, conflicts trials, litigation between parties involved in the contract were the major effects and implications of the delayed projects. The study proposes to provide a new impact of theoretical framework (Ahmed et al., 2022). A study carried out by (Amarasinghe, 2016) on government funded construction projects in Qatar. At the end he identified slow decision making, frequent changes in specification and/or quantity during construction by the Client and Financing problems and late payment to the subcontractors/ suppliers by the Contractor as the most critical causes of delay. According to Awoke and Ahmed (2022). The study findings showed that all factors significantly affect consumer buying behavior. The study carried by Eshetu and Ahmed, (2022) shows that the bank's payment is not based performance which might have discouraged employees from improving their performance. Al-kharash and Skitmore (2009) conducted a study on the delay in Saudi Arabian public sector construction projects. They found out Lack of finance to complete the work by the client, slow decision making by client, Suspension of work by owner, Difficulties in obtaining work permits and Non-payment of contractor claim as the main causes for the delay. Personnel require a great deal of knowledge to carry out their work (Raman et al. 2022). Rizwan et al. (2007) conducted a research on delays in construction industry of Pakistan. A delay criticality index was used to identify the major delay causes in the industry which, in descending order of criticality, were found to be: change orders, labor productivity issues, poor site management and supervision, inspections/audits, poor cost estimation and control, inadequate project scheduling, defective design, inefficient construction methods, delayed payments, and incomplete construction drawings. Abdo(2006),(Muzeyin et al., 2022)made a survey on delays in public building construction projects in Ethiopia. The result of the research indicated that 94% of the 52 surveyed public building projects undertaken by local Contractors between the years 1995 to 2005 have encountered delays. Moreover, the time extension ranges from 10% to 367% and the Average delay is found to be 89.9%. The most frequent causes of delay which in descending order of criticality were found to be: necessary variations, delayed payments, scarcity of materials, late material supply, less emphasis to planning, sub-surface condition, changes in design, material and labor price escalation, unrealistic time schedule, and failure to update schedules on time.

Gebrehiwet and Luo (2017) identified the top greatest main causes of delay in the Ethiopian construction projects. According to their study, corruption is the highest rank of the cause of delay in Ethiopian construction. They also found unavailability of services or utilities at the project site, inflation, less quality material, late design and design documents, less speed of material supply, late in agreement of contract and receiving of completed project work, poor site management and performance, late release budget and unsuccessful project preparation and scheduling. Causes of delay can be, Client related, Contractor related, Consultant related, and External factors.

RESEARCH METHODOLOGY

The current study adopted descriptive research design. Descriptive design helps to describe what actually exists with respect to variables or conditions in a situation. In this case it definitely addresses the objective of what are causes of project delays and associated effects that are experienced related to project delay. In addition, both quantitative and qualitative research approaches applied. The target population of this study is stakeholders in the public construction projects (clients /project owners, contractors and consultants) that have direct involvement to construction activities of public projects found in Dessie town. Based on the following inclusion and exclusion criteria the study population is distinguished.

Inclusion Criteria: Professional Personnel in each category (client, contractor and consultant organization) who has involved in various activities of the project execution process of selected projects are included. They are project managers, site engineers, consultants, foremen, supervisors, office engineers, store mans, and other professionals.

Table 1. Owner related causes

Item code	Owner related causes	(1)	(2)	(3)	(4)	(5)	RII	Ranking
Oq1	Delay in progress payments by owner	0	1	4	48	44	0.8784	1
Oq2	Delay to furnish and deliver the site to the contractor by the owner	1	5	55	23	13	0.6866	5
Oq3	Change orders by owner during construction	2	5	36	42	12	0.7175	4
Oq4	Late in revising and approving design documents by owner	0	28	32	26	11	0.6412	8
Oq5	Delay in approving drawings and sample materials	0	23	32	40	2	0.6433	7
Oq6	Poor communication and coordination by owner and other parties	0	1	3	57	36	0.8639	2
Oq7	Slowness in decision making process by owner	0	1	9	55	32	0.8433	3
Oq8	Conflicts between joint ownership of the project	7	34	32	12	12	0.5753	10
Oq9	Unavailability of incentives for contractor for finishing ahead of schedule	4	15	28	37	13	0.6824	6
Oq10	Suspension of work by owner.	14	20	22	19	22	0.6309	9
	Average RII of owner related causes						0.7163	

Source: Survey (2020)

Table 2. Contractor related causes

Item Code	Contractor related causes	(1)	(2)	(3)	(4)	(5)	RII	Ranking
cq1	Difficulties in financing project by contractor	1	2	36	18	40	0.7938	3
cq2	Conflicts in sub-contractors schedule in execution of project	0	18	45	32	2	0.6371	10
cq3	Rework due to errors during construction	0	18	54	15	10	0.6351	11
cq4	Conflicts between contractor and other parties (consultant and owner),	8	28	35	19	7	0.5773	13
cq5	Poor site management and supervision by contractor	2	1	20	33	41	0.8269	2
cq6	Poor Communication and coordination by contractor with other parties	0	1	23	55	18	0.7855	4
cq7	Ineffective planning and scheduling of project by contractor	0	0	31	21	45	0.8288	1
cq8	Improper construction methods implemented by contractor	1	11	45	11	29	0.7155	5
cq9	Delays in subcontractors work	0	6	48	35	8	0.6928	7
cq10	Inadequate contractor's work	2	2	52	23	18	0.7093	6
Cq11	Frequent change of sub-contractors because of their inefficient work	0	19	40	27	11	0.6619	9
Cq12	Poor qualification of the contractor's technical staff	2	32	35	19	9	0.6021	12
Cq13	Delay in site mobilization	0	11	48	29	9	0.6742	8
	Average RII of contractor causes						0.7031	

Source: Survey (2020)

Table 3. Consultant related causes

Item code	Consultant related causes	(1)	(2)	(3)	(4)	(5)	RII	Ranking
sq1	Delay in approving major changes in the scope of work	7	19	22	29	20	0.6742	2
sq2	Poor communication and coordination	0	10	71	5	11	0.6351	4
sq3	Inadequate experience of consultant	17	24	18	36	2	0.5629	7
sq4	Mistakes and discrepancies in design documents	16	16	33	15	17	0.6021	5
sq5	Delays in producing design documents	16	2	52	2	25	0.6371	3
sq6	Unclear and inadequate details in drawings	13	20	37	20	7	0.5753	6
sq7	Insufficient data collection and survey before design	10	10	24	36	17	0.6825	1
sq8	Unused of advanced engineering design software	16	24	32	12	13	0.5629	7
	Average RII of consultant causes						0.6165	

Source: Survey (2020)

Table 4. External causes

Item code	External causes	(1)	(2)	(3)	(4)	(5)	RII	Ranking
xq1	Effects of subsurface conditions (e.g. soil, high water table, etc.)	0	18	30	25	24	0.7134	1
xq2	delay in obtaining permits from municipality	18	36	28	15	0	0.4825	5
xq3	Hot weather effect on construction activities	29	27	25	7	9	0.4763	6
xq4	traffic control and restriction at job site	24	35	13	9	16	0.5134	4
xq5	accident during construction	32	24	25	16	0	0.4515	7
xq6	changes in government regulations and laws	31	29	27	1	9	0.4515	7
xq7	Delay in providing services from utilities (such as water, electricity)	7	25	37	20	8	0.5938	2
xq8	Delay in performing final inspection and certification by a third party.	8	33	33	14	9	0.5649	3
	Average RII of external causes						0.5309	

Source: Survey (2020)

Table 5. Ranking of top ten causes of delay

Item code	Causes of delay	Responsible stakeholder	RII	Rank
oq1	Delay in progress payments by owner	Owner	0.8784	1
oq6	Poor communication and coordination by owner and other parties	Owner	0.8639	2
oq7	Slowness in decision making process by owner	Owner	0.8433	3
cq7	Ineffective planning and scheduling of project by contractor	Contractor	0.8288	4
cq5	Poor site management and supervision by contractor	Contractor	0.8269	5
cq1	Difficulties in financing project by contractor	Contractor	0.7938	6
cq6	Poor Communication and coordination by contractor with other parties	Contractor	0.7855	7
oq3	Change orders by owner during construction	Owner	0.7175	8
cq8	Improper construction methods implemented by contractor	Contractor	0.7155	9
xq1	Effects of subsurface conditions (e.g. soil, high water table, etc.),	External	0.7134	10

Table 6. Delay effects

Item code	Effects of delay	(1)	(2)	(3)	(4)	(5)	RII	Ranking
eq1	Time overrun	0	2	1	39	55	0.9031	1
eq2	Cost overrun	0	1	7	56	33	0.8495	2
eq3	Poor quality	5	6	53	10	23	0.6825	6
eq4	Bad public relation	0	35	33	13	16	0.6206	8
eq5	Dispute	1	8	25	31	32	0.7753	4
eq6	Negotiation	8	7	39	25	18	0.6784	7
eq7	Litigation	0	6	50	29	12	0.6969	5
eq8	Total Abandonment	1	3	24	38	31	0.7959	3
	Average RII of effects of delay						0.7503	

Source: Survey (2020)

Exclusion criteria: Daily Labor workers in cite works are purposively excluded from the study since they did not have full information about the topic of interest. So, the target population is all Professional personnel in each category of stakeholder organizations. Hence the total population of the study is one hundred twenty-eight (128). By applying census method all of them incorporated in the study. Sampling is the art of taking representative elements from the population (Muzeyin et al., 2022). In this study primary data planned to use. Primary data are those data which are collected for the first time and original in character while Secondary data are those which have been collected by some other persons for his purpose and published (Sreevidya& Sunitha.2011). The primary data sources are project managers, site engineers, consultants, foremen, supervisors, office engineers, store mans, and other professionals in each stakeholder organization(clients, consultants and contractors) of ongoing public projects which are already delayed.

DATA ANALYSIS AND INTERPRETATION

This part of the research presents the data collected from the target respondents and major interpretations and discussions also forwarded accordingly. As per the methodology 128 questionnaires were distributed to respondents and only 97 questionnaires are returned completely and accurately. The response rate is 75.8%. Hence it is enough to continue the data analysis and interpretation.

Data Presentation and Analysis on Causes of Delay: In order to analysis the causes of delays of public construction projects i.e. road and building of Dessie town a five point likert scale ranging from Strongly disagree to Strongly agree was applied. The feedback from the respondents had been manipulated using Spss v22 and Microsoft Excel application to determine frequency and Relative indices. Basically relative importance index (RII) analysis was selected in this study to rank the causes and effects of delay according to their relative importance consistently to majority of previous studies in this area. Based on the relative indices (RI), the ranking will be determined. According to Akadiri (2011), five important levels are transformed from RII values: high (H) ($0.8 \leq RI \leq 1$), high medium (H-M) ($0.6 \leq RI \leq 0.8$), medium (M) ($0.4 \leq RI \leq 0.6$), medium-low (M-L) ($0.2 \leq RI \leq 0.4$) and low (L) ($0 \leq RI \leq 0.2$).

Owner Related Delay Causes: One of the factors which cause to delay of construction projects emanated from the owner or client of the project. In this respect the respondents were asked to rank the importance or significance of causes for delay of project using five points scale strongly disagree (1), disagree (2), moderately agree (3), agree (4) and strongly agree (5). The following table clearly presented the Relative importance index (RII) of owner based causes of project delay based on the respondents' feedback in the target area. As shown on the above table, the most highly ranked owner related delay causes, in the construction of road and building projects, in their order are delay in progress payments by owner (RII=0.8784), Poor communication and coordination by owner and other parties (RII=0.8639), Slowness in decision making process by owner (RII=0.8433), Change orders by owner during construction (RII=0.7175) and Delay to furnish and deliver the site to the contractor by the owner (RII=0.6866).

In addition unavailability of incentives for contractor for finishing ahead of schedule (RII=0.6824); delay in approving drawings and sample materials (RII=0.6433); late in revising and approving design documents by owner (RII=0.6412); suspension of work by owner (0.6309) and conflicts between joint ownership of the project (0.5753) are the other owner related causes. This study confirmed that construction projects in the study area highly (i.e RII>0.7) delayed by owners or clients originated causes that are delay in progress payments by owner, poor communication and coordination by owner and other parties, slowness in decision making process by owner and change orders by owner during construction. More importantly slowness of the decision making process is the management failures of those public agencies.

Traditionally, there is a saying of "bureaucracy" commonly repeated by many stakeholders to express their concern about the failed management system followed by those public agencies. This finding is consistent with some of the previous studies like (Amarasinghe, 2016); (Tilahun, 2016); (Albatsh, 2015). In addition from open ended questions respondents strongly confirmed that the budget allocation of owners of the projects is poor and unmanageable. Their project monitoring and evaluation activities are also very limited and not adequate. More over some individuals in the client organization used their personal interest as negotiating tool with contractors which is against the project specification. Respondents stated it as "rent seeking" activity. They said corruption is a huge problem in construction projects especially in road projects in Dessie town. Similarly Gebrehiwet and Luo (2017) found out the highest rank of the cause of delay in Ethiopian construction projects is corruption. The study found that most employees' perceptions were low for all significant work-life balance initiative (Seman et al., 2022). This kind of action totally affects the project completion time. The other cause of delay stated by respondents related to owners is there is a gap in design and detailed work procedures after the project is commenced which ultimately delayed a project.

Contractor Related Causes: Other causes for project delay emanated from contractors side. The following table presents the thirteen causes under this category with their frequency and Relative importance index. The above table shows that the determinant causes for delay of projects from contractors' side. The results of the survey showed that, the most important and highly ranked contractor related delay causes in the construction projects, are ineffective planning and scheduling of project by contractor (RII=0.8288), poor site management and supervision by contractor (RII=0.8269), difficulties in financing project by contractor (RII=0.7938), poor communication and coordination by contractor with other parties (RII=0.7855) and improper construction methods implemented by contractor (RII=0.7155). In addition, inadequate contractor's work (RII=0.7093); delays in subcontractors work (RII=0.6928); delay in site mobilization (RII=0.6742); frequent change of sub-contractors because of their inefficient work (RII=0.6619); Conflicts in sub-contractors schedule in execution of project (RII=0.6371); Rework due to errors during construction (RII=0.6351); poor qualification of the contractor's technical staff (RII=0.6021) and conflicts between contractor and other parties (RII=0.5773) are also found as contractors related causes.

All of the above mentioned causes have moderate to high relative importance in causing of delay since their RII is within the range of $0.5 \leq RII \leq 0.9$. Over all from contractors' side the most important causative factors which leads projects to delay is ineffective planning and scheduling of project by contractor; poor site management and supervision by contractor, This is completely agreed with the findings of (Mpfu, Ochieng, Pretorius, & Moobela, 2015), and difficulties in financing project by contractor. Moreover respondents assured the management system of the contractor and financial flow is strongly centralized. Hence, project activities in the site delayed due to lack of working capital for financing materials and remunerating labors. The other cause of delayed raised by respondents is lack of sustained work motivation and commitment as it was in the beginning of the project execution phase on behalf of contractors.

Consultant Related Causes: The third category of causes is consultant related causes. It consist eight items and respondents asked to rate their level of agreement across five point liker scale. Based on their feedback frequency of each scale and relative importance index is calculated and presented as follows. In addition to clients and contractors, consultants are other stakeholders of construction projects in Dessie town which cause delay of projects. Based on the respondents feedback gained from the survey the primary four vital causes of delay are insufficient data collection and survey before design, delay in approving major changes in the scope of work, delays in producing design documents, poor communication and coordination with relative importance indices of 0.6825, 0.6742, 0.6371 and 0.6351 respectively. The others are mistakes and discrepancies in design documents, unclear and inadequate details in drawings, unused of advanced engineering design software and inadequate experience of consultant. Their $RII > 0.5$ hence, they are moderate to highly important to cause of delay. On the contrary (Pandit & Ashok, 2017) found out that inadequate consultant experience the most determinant factor which cause delay in construction projects on behalf of consultants. From the open ended questions respondents assured consultants delayed in approving material test and inspection results and they see themselves as supervisors only not as supportive as expected.

External Causes: External causes are other factors for delay of project. It contains eight causes. Again Relative importance indices calculated based on respondents feedback.

Besides to the above mentioned project stakeholder related causes there are also external causes for project delay. In this aspect respondents were also asked to what extent these external factors cause for delay of construction projects in Dessie town. Accordingly as shown in the above table the most important and highly ranked external factor of delay causes in the construction of projects are effects of subsurface conditions (e.g. soil, high water table, etc.) with $RII=0.7134$, delay in providing services from utilities (such as water, electricity) with $RII=0.5938$, delay in performing final inspection and certification by a third party with $RII=0.5649$ and traffic control and restriction at job site with $RII=0.5134$. The other external causes have low ($RII < 0.5$) importance to cause of project delay. These includes delay in obtaining permits from municipality with RII value of 0.4825 followed by hot weather effect on construction activities with RII value of 0.4763, accident during construction and changes in government regulations and laws each with RII value of 0.4515. The result tells us an effect of subsurface conditions is the most important external cause of delay. Respondents indicated lack of study on the nature of underground soil of the town is becoming a huge obstacle to complete construction projects timely. The result supports the findings of (Pandit & Ashok, 2017) found out that "unforeseen ground condition" and unexpected geographical condition" as the main reasons for construction project delay. Delay in providing and obtaining utility services such as water, electricity is another significant external cause which leads many projects in the town to be delayed. It is known that these services are very vital to start any kind of constrictions in a particular project site. Unable to get this utility makes the project to be delayed from the planned time schedule.

Furthermore respondents stated inflation is another cause of project delay. This finding is in line with the study of Gebrehiwet and Luo (2017).

The Top Ten causes of Delay: Based on the relative importance index the primary top ten causes of delay were identified from the total of 39 causes investigated in this study across four categories i.e. client, contractor, consultant and external. The top three causes of delay were related to the category of client, namely delay in progress payments by owner, Poor communication and coordination by owner and other parties and Slowness in decision making process by owner with RII values of 0.8784, 0.8639 and 0.8433 respectively. The fourth up to seventh ranked causes attributed to contractors that are ineffective planning and scheduling of project by contractor, Poor site management and supervision by contractor, Difficulties in financing project by contractor and Poor Communication and coordination by contractor with other parties with RII values of 0.8288, 0.8269, 0.7938 and 0.7855 respectively. Further more frequent change order by owner ranked eighth with RII value of 0.7175 and improper construction methods implemented by contractor followed with RII value of 0.7155. The last ranked cause is external which an effect of subsurface conditions like soil, high underground water etc. with RII value of 0.7134. This finding is similar to the study of Msafiri (2015) that the top five causes of project delays were observed to be payment by client, slow decision making and bureaucracy in client organization, inadequate planning and scheduling, and rain. Generally based on the top ten causes, contractors share 50% causes of delay; clients share 40% of causes of delay and external causes 10% of delay.

Effects of Delay: The aspiration to finish a project on time, with the planned budget and highest quality is among the common goals for all contracting parties including owners, contractors and consultants. Delay usually result in losses of one form or another way for everyone. The above mentioned and discussed causes lead to the effects of delay on construction projects. In this aspect the respondents were asked to rate their agreement on the occurrence of effects of delay using five points scale (never, seldom, sometimes, often and always) having a score from 1 to 5 respectively. Based on their feedback relative importance index (RII) calculated for each effect to rank the frequency of effects from the most important to the least ones.

Results from the above table shows that time overrun ranked the highest with RII of 0.9031, while cost overrun or increase in final cost of the project is ranked second with RII of 0.8495. Total Abandonment becomes third with RII value of 0.7959. Dispute comes fourth with RII of 0.7753. Litigation ranked fifth with RII value of 0.6969. Poor project quality ranked sixth with RII value of 0.6825. Negotiation and bad public relation are seventh and eighth ranked with RII values of 0.6784 and 0.6206 respectively. The findings confirmed that effects of delay highly and frequently occurred because of delay of projects since their overall average RII is greater than 0.7 i.e. 0.7503. Based on these figures the highest occurred delay effects are time overrun and cost overrun. This result is similar with almost all previous related studies (wei, 2010). Moreover respondents stated that prevalence of construction projects delay in Dessie town makes public servants unable to give adequate services demanded by the community. This in turn has significant economic losses to the town and the country in general. Even some projects specially mixed used apartments and internal asphalt road abandoned currently.

CONCLUSION

Based on the results of data analysis and interpretations the following conclusions are drawn. The main determinant causes of delay are emanated from clients, contractors, consultants and externals. Among client related causes delay of progress payments by owner, poor communication and coordination by owner and other parties and slowness of the decision making process, change orders by owner

during construction are the top casual factors. Series rent seeking activity (corruption) in public agencies, bureaucracy and red tape, poor and unmanageable budget allocation, poor project monitoring and evaluation system and lack of detailed work procedures are also the main owner related causes of project delay in Dessie town. The study has unveiled a number of important causes of construction delays in Dessie town from contractors' side. Ineffective planning and scheduling of project by contractor, Poor site management and supervision by contractor, difficulties in financing project by contractor, poor communication and coordination by contractor with other parties and lack of sustained work motivation and commitment are the most determinant causes of delay. Insufficient data collection and survey before design, delay in approving major changes in the scope of work, delays in producing design documents, poor communication and coordination, delayed in approving material test and inspection results and looking themselves as supervisors instead of being supportive are the major causes of delay emanated from consultants. Effects of subsurface or geographical conditions, un able to get water, electric and other utilities timely, delay in performing final inspection and certification by a third party, traffic control and restriction at job site and inflation are the most important external causes of delay. From the overall causes, poor communication and coordination among stakeholders and financial difficulties are the common causes originated from all stakeholders i.e. clients, contractors and consultants. More over delay in progress payments by owners takes the primary position for delay of projects. This is due to lack of finance resulted from mismanagement of the available budgeted capital of the project by corruption and wastage. Hence finance specifically the working capital element is the backbone of a project. Not having enough cash on hand means stopping the project not only delaying. The quantitative figures revealed that owners/clients seemingly shouldering the bulk of the 'blame game'. It means they are mostly responsible for delay of construction projects of Dessie town. It was evident however that still the other two main stakeholders in a construction project (contractors and consultants) have their contribution for project delay. Relatively external factors have less impact for delay as compared to causes emanated from clients, contractors and consultants. This indicated the causes of project delay in Dessie town are internal and manageable. Once those stakeholders look themselves internally, they can create a significant change. Results of the study confirmed time overrun, cost overrun, total abandonment, dispute, litigation; poor project quality, negotiation and bad public relation are the effects of the delay encountered so far in Dessie town. Besides all, other non-quantifiable delay damages that cannot be stated in terms of money such as the dissatisfaction of community because of inability of getting demanded services are also observed. Generally project delay specifically public construction projects delay effects are multidimensional that affects the life of thousands of residents of the town directly or indirectly economically or socially. To sum up, it costs the country a lot.

REFERENCES

- Abdo, A. (2006). Delays in Public Building Construction Projects and their Consequences. Master Thesis, Civil Engineering Department, AAU, Addis Ababa.
- Ahmed H. M. S., Ahmed Y. A., Kar B. (2017). The Impact Of Demographic And Family Background Factors On Students' Tendency Towards Entrepreneurship In Ethiopia. *International Journal of Management and Social Science Research Review*, Vol-1, Issue-40, Page 100. <http://ijmsrr.com/admin/archive.php?m=102017>
- Ahmed H. M. S., Buba M. G., Thomran M., Muzeyin J. R., and Ferejo M. N. (2022) 'Evaluation Of Critical Determinants Of Inventory Management Techniques On Universities' Performance In Ethiopia', *SMART Journal of Business Management Studies*, Vol. 18, No. 2, p.51-59. <https://www.smartjournalbms.org/journal/vol-18-2/Evaluation-of-critical-determinants-of-inventory-management-techniques-on-Universities-performance-in-Ethiopia.html>
- Ahmed H. M. S., Tessma T. (2020). Employers' Expectations and Perceptions of Business and Economics College Graduate's Competencies in Ethiopia. *IBMRD's Journal of Management & Research*, 9(2), 37-50. <http://ibmrdjournal.in/index.php/ibmrd/article/view/156630>
- Ahmed, H. M. S., Ahmed, Y. A., and Thomran, M. (2022). 'Psychological Factors Predicting the Likelihood of Youth Entrepreneurship in Ethiopia' *Human Systems Management*.pp 1 – 15. <https://content.iospress.com/articles/human-systems-management/hsm220034>
- Aibinu A.A. &Jagboro G. O.,(2002) The effect of construction delays on project delivery in Nigerian construction industry, *International Journal of Project Management*, Volume 34, Issue 3, 593- 599.
- Akadiri O.P., 2011, Development of a Multi-Criteria Approach for the Selection of Sustainable Materials for Building Projects, PhD Thesis, University of Wolverhampton, Wolverhampton, UK.
- Akinsiku, O. E and Akinsulire, A. (2012), Stakeholders' Perception of the Causes and Effects of Construction Delays on Project Delivery. *KICEM Journal of Construction Engineering and Project Management: Online ISSN 2233-9582*.
- Akinsulire, A. (2008). Effects Of Delay On Construction Project delivery.
- Al- Kharash A. &Skitmore M. (2009): "Causes of Delays in Saudi Arabian Public Sector Construction Project". *Journal of Construction Management & Economics*.Vol 3, pp. 3-23. *Business Sources Complete, EBSCOhost [Online]*. (Accessed: 7th January, 2020).
- Albatsh, N. J. (2015). Assessment of Delay Causes of Construction projects in Palestine.MasterThesisa, Al Najah National Univerity, Palestine.
- Armide, T. L. (2018). The Assessment of 20/80 Condominium Housing Projects performance in Addis Ababa: The case of Akaki -Kaliti Sub city. Addis Ababa.
- Assaf, S. A., & Al-Hejji, S. (2006). Causes of delay in large construction projects. *Int. J. Proj. Manage.*, 24 4_, 349–357.
- Bentator, B. &Thumann, A. (2003).Project management and leadership skills for engineering and construction projects. USA: Fairmont Press Business Dictionary, (2019). Definition of Project. [online] Available at: <http://www.businessdictionary.com/definition/project.html> [Accessed 14 September. 2019]
- Buba M. G., Das D. P., Ahmed H. M. S. (2018) Service Quality Dimensions and Its Impact on Customer Satisfaction on Private Bank in Ethiopia. *IOSR Journal of Business and Management (IOSR-JBM)*. Vol-2, Issue-2 Pp 1-9. <https://www.iosrjournals.org/iosr-jbm/pages/Conf.18011-2018-Volume-2.html>
- El-Razek1, M. E., &Mobarak, H. A. (2008).Causes of Delay in Building Construction. *Journal of Construction Engineering And Management* , 134(11).
- Eshetu S. and Ahmed H. M. S. (2022). "The Impact of Remuneration Policy on Employee's Performance: Evidence from Dashen Bank in Ethiopia", *International Journal of Innovation Scientific Research and Review*, Vol. 04, Issue 04, pp.2592-2599. <http://journalijisr.com/issue/impact-remuneration-policy-employee%E2%80%99s-performance-evidence-dashen-bank-ethiopia>
- Ferejo, M.N., Ahmed, H.M.S., Muzeyin, J.R., Amde, S.J, Thomran, M., Mamuye, F. (2022).Exploring factors affecting growth of micro and small enterprises: Evidence from Ethiopia.*International Journal of Sustainable Development and Planning*, Vol. 17, No. 5, pp. 1523-1533. <https://doi.org/10.18280/ijstdp.170516>
- Fugar, F.D. &Agyakwah-Baah, A.B. (2010).Delays in building construction projects in Ghana. *Australasian Journal of Construction Economics and Building*, 10(1/2): 103–116.
- Gebrehiwet, T. &Luo, h.,(2017) Analysis of Delay Impact on Construction Project Based on RII and Correlation Coefficient: Empirical Study, *Creative Construction Conference 2017, CCC 2017*, 19-22 June 2017
- Kezner, H. (2000). *Project Management: A Systematic Approach to Planning, Scheduling and Controlling*. Delhi: CBS Publishers & Distributors

- Mpofu, B., Ochieng, E.G., Pretorius, A., & Moobela, C. (2015). Profiling causative factors leading to construction project delays in the United Arab Emirates.
- Msafiri, A., S. (2015) An Investigation into Factors Causing Delays in Road Construction Projects in Kenya, *American Journal of Civil Engineering*, Vol. 3, No. 3, pp. 51-63. doi: 10.11648/j.ajce.20150303.11
- Muzeyin J. R., Ahmed H. M. S., Amde S. J., Thomran M., and Ferejo M. N. (2022) 'Determinants Of Brand Awareness In The Context Of Ethiopian Domestic Leather Footwear Industries', *SMART Journal of Business Management Studies*, Vol. 18, No. 2, p. 60-68. <https://www.smartjournalbms.org/journal/vol-18-2/Determinants-of-Brand-Awareness-in-the-Context-of-Ethiopian-Domestic-Leather-Footwear-Industries.html>
- Muzeyin, J. R., Ahmed, H. M. S., Awoke, Y., Ferejo, M. N., Abebaw, T., Beyene, T. Y., & Amde, S. J. (2022). Exploring determinants of employee engagement in the emerging market [Special issue]. *Corporate & Business Strategy Review*, 3(2), 238–247. <https://doi.org/10.22495/cbsrv3i2siart5>
- Pandit, R., & Ashok, p. (2017) Causes and Effects of Delays in Construction Projects.
- PMI (2017). A guide to the project management body of knowledge, 6ed. USA, Newtown Square, PA: Project Management Institute.
- PMI(2013). A guide to the Project Management Body of Knowledge. 5th Edition. PMBOK Guide.
- Ramanathan, C., Narayanan S., Idrus, A.B. (2012) Construction delays causing risks on time and Cost-a critical review, *Australasian Journal of Construction Economics and Building*, Vol. 12 No. 1, pp. 37-57
- Rizwan U.F., Syed M.A., & Muhammad S. (2007). Delays in Construction: An Empirical study of Contractors' perceptions in Pakistan Construction industry. paper 1, page 256-270 July 11-13, 2007
- Scott S (1993). The nature and effects of construction delay. *Construction Management and*
- Seman, A. A., Ahmed, H. M. S., Refera, M. K., Amde, S. J., Thomran, M., & Ahmed, Y.A (2022). Assessing the Effect of Work-Life Balance Initiatives on Organizational Citizenship Behaviour Marketing and Management of Innovations, 4, 207-217. <https://doi.org/10.21272/mmi.2022.4-19>
- Symon, A.K. (2016) An Investigation Into The Causes Of Delay In Large Construction Projects In Kenya Master thesis, department of Construction Engineering and Management, Jomo Kenyatta University Of Agriculture And Technology, Kenya.
- Thomran M., Ahmed H. M. S. (2020). Challenges Faced the Internal Audit Profession in Yemen, *International Journal of Management*, 11(9), pp. https://iaeme.com/Home/article_id/IJM_11_09_096
- Tilahun, S. (2016). Cause and Effects of Delay on Educational Building. Master Thesis, School of Civil and Environmental Engineering, Addis Ababa University, Addis Ababa.
- Wei, K. s. (2010). Causes, Effects And Methods of Minimizing Delays in Construction Projects. Thesis, Faculty of civil engineering, Universiti Teknologi Malaysia, Malaysia.
- Yenealem, F. (2018). Determinants of Infrastructure Project Delays and Cost Escalations. The Case of Road and Rail Construction Projects in Ethiopia. Master Thesis, Department of Public Administration and Development Management, Addis Ababa University, Addis Ababa.
- Zack, J. G., (2003). Schedule delay analysis; is there agreement?.
