



**TITLE: STUDY ON COMMUNICATION PRACTICE ON THE PUBLIC
BUILDING CONSTRUCTION PROJECTS AMONG STAKEHOLDERS**

THE CASE OF BAHIR DAR CITY, ETHIOPIA

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ABSTRACT

Construction is a team activity involving many different actors specialized in various areas. An ineffective communication management system in the construction projects is the major cause of failure. The main objective of the study is to explore the communication practices on the public building construction projects between stakeholders in Bahir Dar City. The significance of the study is to help all stakeholders to be aware of factors, which are drawbacks of project success to avoid such negative impacts and get committed for better performance. Data were collected from building contractors, consultants, clients, and Urban Development and Housing Construction Bureau. The data collection method included a desk study interview, panel discussion, and questionnaire survey. The gathered data were analyzed by using Statistical Package for Social Scientist (SPSS) software computer program. Both descriptive and inferential statistics were used for the analysis of the data. Per the analysis carried out, communication practice in construction companies is less effective; less training is given for the purpose of project communication. As understood from the finding, oral communication is the most widely used or practiced in construction projects rather than formal and written communications. The majority of construction firms use informal communication methods in their construction projects. The most popular communication channel (96%) used in construction projects were phones.

Keywords: Communication channel, Communication practices, Project communication, Stakeholders.

1. Introduction

Construction projects is unique in the sense that, they are often consisting of new actors that need to collaborate and involve in many uncertainties throughout the project's lifecycle. There is a widespread of stakeholders involved in conceiving a building project through typical stages such as design, finance, build, manage, upgrade and ultimately, replacement and a corresponding need for communication and cooperation [1].

Construction is the second-largest activity in the Ethiopian economy to contribute GDP and the success of such large-scale construction projects is a vital factor for its growth. The project communications management processes provide critical relations among people and information that is necessary for the successful completion of projects [2]. Communication is a wide-term that attracts major attention through many works of literatures. Studies have confirmed that it is the foundation of every human interaction between the different organizations, any parts of the exchange of ideas, and it gives meaning and solidity to the conducted activities. Primarily, the word communication as the process of informing and interchanging ideas, viewpoints or information, by speaking, writing or signals [3].

Communication is transferring any information between people and can be the pipeline that transfers activity situations from one individual to another. Communication is one of the main tools necessary for project success in the construction industry [4]. Drawings, specifications and construction methods must be communicated throughout all the stages of construction. Therefore, all construction project execution requires effective communication means between construction professionals in any project delivery. Studies have revealed that proper communication between stakeholders has a significant contribution to any project's success. With this as vital concern, all stakeholders in the industry should ensure that project communication must always be on the agenda of the project management team and site workers before the commencement of the actual project. Having the above in mind, the study aims at assessing and evaluating the state of communication and its effectiveness on public building projects in the City of Bahir Dar.

2. Research Methodology

2.1. Description of the Study Area

The study was conducted in Bahir Dar City, which is the capital of Amhara National Regional State of Ethiopia. The City is located at 578km northwest of Addis Ababa the capital of Ethiopia. It is located at 11.59 latitude and 37.39 longitudes at an elevation 1799 meters above sea level. Currently, the City covers a total area of 256.4km². Bahir Dar is one of the leading tourist destinations in Ethiopia, due to the nearby Lake Tana and Blue Nile River.

2.2. Research Approach

Three research approaches are advanced: qualitative, quantitative, and mixed methods. Qualitative research is an approach for exploring and understanding the meaning individuals or groups assigned to a social or human problem. Quantitative research is an approach for testing objective theories by examining the relationship among variables. Mixed methods of research is an approach to an inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data. In this research, mixed approaches are used. Because the research described by both qualitative and quantitative.

2.3. Research Strategy

In here, the research has both quantitative and qualitative approaches and explanatory because the research was initiated from practical problems. It is also descriptive because it tries to describe the so far exercised and ongoing communication practices and its impact on the performance of public building projects among stakeholders.

2.4. Source of Data and Data Collection Methods

While deciding on the source of data for the study, the researcher should keep in mind two types of data, which are primary and secondary. The primary data are those, which are, collected a fresh and for the first time and thus happen to be original in character. Whereas, the secondary data are those which someone else has already collected and which have already passed through the statistical process. This study used interviews, questionnaire and panel discussion for collecting data.

2.5. Population and Sample Size for the Study

The study uses key construction project parties who participated in the completed and ongoing public building construction projects in Bahir Dar City among stakeholders. Those are project owners, project consultants, project contractors, and Urban Development and Housing Construction Bureau. The study covers Grade/Category one to five contractors and consultants. The researcher uses own judgment which respondents to choose and picks those who best meet the purposes of the study. This is carried out to enable the researcher to select active and experienced main stakeholders for the study. It is the purposive sampling technique, which is a non-probability-sampling technique that was used for the study. According to Bahir Dar City municipality data, public building construction projects in Bahir Dar City from Grade I to V public buildings construction projects, forty-eight (48) contractors with eleven (11) Clients, thirteen (13) consultants and one (1) Urban Development and Housing Construction Bureau.

$$n = \frac{n'}{1 + \frac{n'}{N}} \dots\dots\dots (Eq. 2.1)$$

Where: -

n' = is the sample size from infinite population, which can be calculated from the above formula

$n' = \frac{S^2}{V^2}$ The definitions of all variables can be define as the following:

n = sample size from finite population.

N = Total population (48 contractors, 13 consultants, 11 clients and 1 UDHCB)

V = Standard error of sample population equal 0.05 for the confidence level 95% was used for this study.

S^2 = Standard error variance of population elements, $S^2 = P(1 - P)$;

maximum at $P = 0.5$

2.6. Pilot Study

A pilot study for the questionnaires was conducted by distributing the draft questionnaire to a number of experts in the field of the research topic. The pilot procedure was conducted by

selecting three contractors, three consultants, three clients and one Urban Development and Housing Construction Bureau professionals. Experts' suggestions and comments were, collected, discussed and evaluated during the piloting. The questionnaire was then finalized and ready for distribution. The piloting stage increased the effectiveness of the questionnaire.

2.7.Validity and Reliability Test

2.7.1. Validity Test

There should be multiple strategies for the researcher to assess the accuracy of the findings and convince the readers of that accuracy. Construct validity primarily takes place in the data collection phase. Key strategies are multiple sources of evidence, establishing a chain of evidence, and having key stakeholders. The collected data are from interviews, observations, questionnaires and panel discussion.

2.7.2. Reliability

The study utilizes consistency method in determining the instrument reliability with the Cronbach's Coefficient Alpha. As the relevant coefficient to evaluate the consistency of items such as individual questions in a questionnaire. the statistical procedures such as Cronbach's alpha coefficient, randomly splitting all the responses to a question into two sets, calculating the scores on the two sets, and working out the correlation between the two sets. This is known as a 'split-half' test. Reliability of 0.95 means 95 percent of the variability in the observed score is true and due to error at determining P-value is five percent (5%).

2.8.Research Data Analysis

Both descriptive and inferential statistics are employed to analyze the data obtained from the questionnaire, interview, and panel discussion. The data were collected from respondents, analyzed properly by using Statistical Package for Social Scientist (SPSS) software computer program and Microsoft excel. In the research, both descriptive and inferential statistics were used for the analysis of the data collected through the survey.

$$RII = \frac{\sum W}{NA} = \frac{\sum(5n_5+4n_4+3n_3+2n_2+n_1)}{(5(n_5+n_4+n_3+n_2+n_1))} \dots\dots\dots \text{Equation.2.2}$$

Where:

RII= relative importance index

n_1 = Number of respondents who answered 'Totally Disagree.

n_2 = Number of respondents who answered 'Mostly Disagree.

n_3 = Number of respondents who answered 'Neither Agree nor Disagree.

n_4 = Number of respondents who answered 'Mostly Agree.

n_5 = Number of respondents who answered 'Totally agree.

A = the highest weight (which is 5 in this case).

N = sample number.

3. Analysis, Results and Discussion

3.1. Interview Data and Analysis

Semi-Structured interviews were carried out to develop and validate questionnaire responses as part of the research. As compared to the quantitative questionnaire survey, the qualitative experts' interview provides a direct or face to face, more in-depth interaction with the respondents. Semi-structured interviews targeted fifteen (15) professionals working in different project companies: which were contractors, clients, consultants, and Urban Development and Housing Construction Bureau.

Interviews have some questions, which were not included in the questionnaire in order to obtain more information, specific to the practices of communication and its impact on the performance of public building construction among stakeholders in Bahir Dar projects. The interviewees were sampled by using a purposive sampling method to obtain data from the selected stakeholders in the construction projects. This was understood as the best professionals in the field to provide the required information. The selection of a professional depended on experience in the construction industry, the level of education and the level to which they were involved in the building construction projects.

3.1.1. Interviewees' opinion on construction projects accomplishments with effective communication

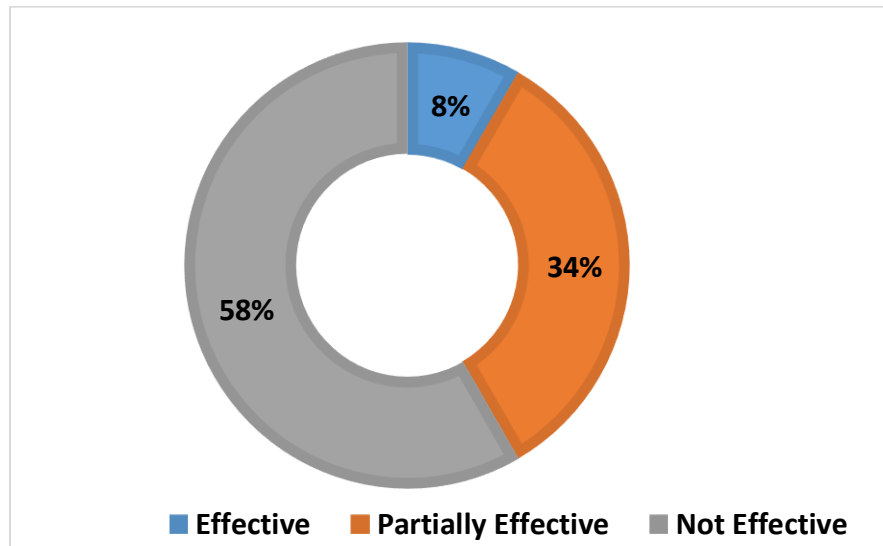


Figure 3.1: Interviewees' opinion on the construction projects accomplishments with effective communication

From Figure 3.1, it is evident that the majority of seven (58%) of the interviewees were of the opinion that communication in the organization less effective among stakeholders. Four (34%) of the Interviewees were of the opinion that, communication made on their organization was partially effective in their construction projects. One (8%) of the interviewees were of the opinion that, communication made on their organization is effective in their construction projects. However, in literature effective project communications ensure that the right information reaches the right person at the right time and in a cost-effective manner. Communication is crucial to keeping team members and stakeholders knowledgeable.

Based on the interviewees' opinion that effective communication is a critical element for construction projects to complete a project. In addition, regulatory bodies should give attention to project communication for the success of the project. Particularly project managers should play a great role in their construction projects. Because, in literatures project managers should spend 90% of their time on project communication.

3.1.2. Communication method/line on construction projects

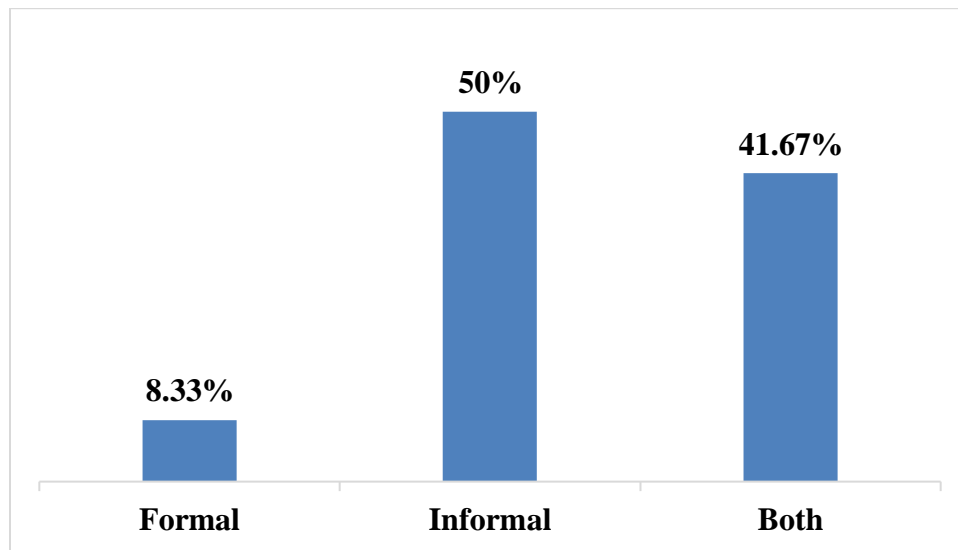


Figure 3. 2: Communication method/ line on construction projects

As shown in Figure 3.2, the majority, six of (50%) the interviewees were of the opinion that, the communication method/line that follows was informal. Five (41.67%) of the interviewees were of that the opinion that, communication line they follow was both formal and informal. Only one (8.33%) of the interviewees were of the opinion that, they follow formal communication methods in their building construction projects. It is important to determine the lines of communication in construction projects and the methods in which managing information on projects.

Based on the interviewees' opinion that there are two primary lines of communication, namely formal communication and informal communication. Formal communication can be categorized as vertical, horizontal and diagonal. Vertical communication is the upward and downward communication flow between different hierarchical levels of the organization. The main function of upward communication is to supply information to the upper levels about what is happening at the lower levels. Horizontal/lateral communication takes place between people at the same level of the hierarchy. This formal communication does not follow the chain of command. Diagonal communication takes place between people at different levels of the hierarchy. Informal communication uses informal social groupings or concerns of some people from the project team.

3.1.3. Communication problems on the building construction projects

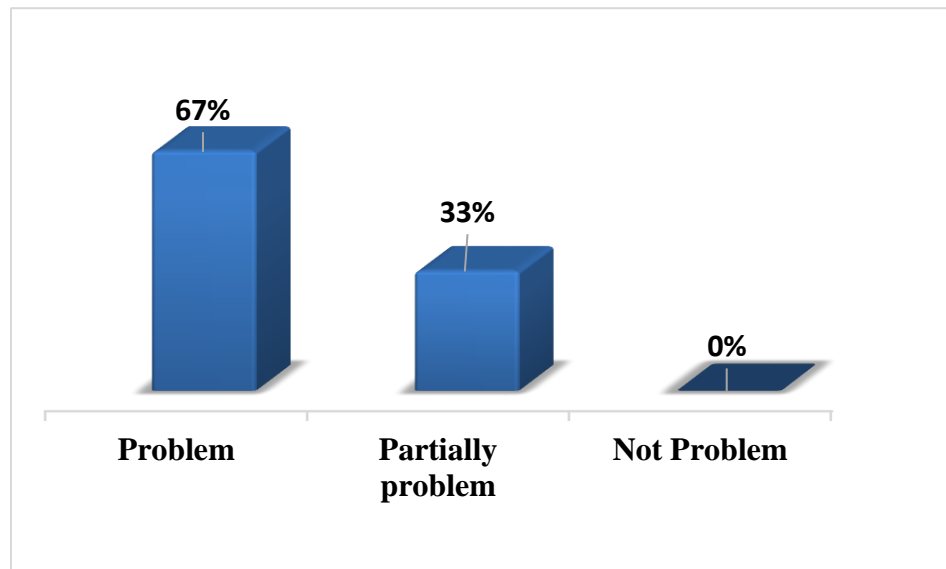


Figure 3. 3: Communication as a problem on construction projects

The Figure 3. 3 above shown that, the majority, eight (67%) of the interviewees were of the opinion that project communication is a problem in their organizations. Four (33%) of the interviewees were of the opinion that project communication is partially a problem on their construction projects.

Based on the interviewees' opinions that, internal communication problems can cause ineffective communication for their companies and a lot of job dissatisfaction. In the Bahir Dar construction sector, where a large number of employees either work far from the central office or frequently travel between offices and job sites was challenging due to communication problems. In addition, the communication problems can lead to miscommunication and misalignment between teams. Therefore, communication should be clear as much as possible, unless it leads to delays and can negatively affect employee morale. An employee, who does not know the goals of the project or have not clear objective, may not bring the expected results.

3.2.Results, Analysis and Discussion on Panel Group (Qualitative Methods)

The discussion questions were derived from the desk study. The panel discussion was conducted in Bahir Dar University Poly Campus. Since the panelists and other participants were from the contractors, clients, and consultants, which were among the population of this

research. The main objective of the panel discussion was to assess the communication practices and their impact on the performance of public building construction projects among stakeholders. Per the understanding of panelists and participants, a total of four panelists and thirteen participants were presented in the discussion.

3.2.1. The current situation of communication with regard to accessing and sharing information in an organization

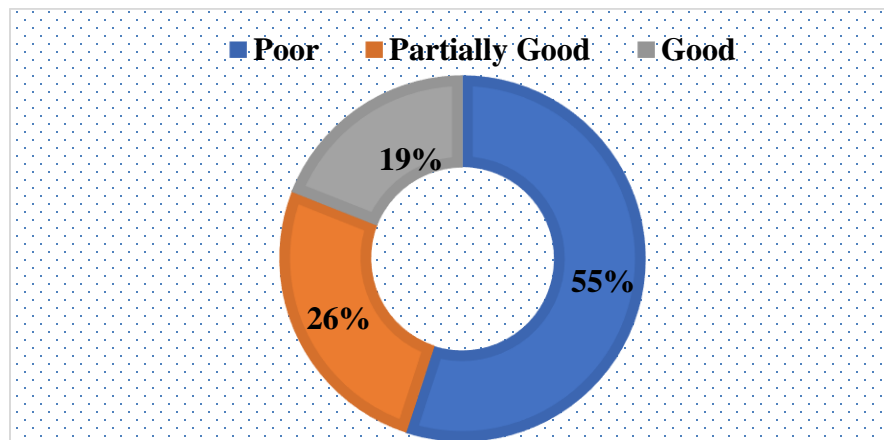


Figure 3.4: The current situation of communication in an organization

As it is indicated in Figure 3.4, the majority (55%) of the panelists and participants who were involved in this discussion agreed that the current situation of project communication was poor. Twenty-six percent (26%) of panelists said that partially well and 19% of panelists and participants said that the current communication practice is good in their construction projects.

Panelist number one said:

As per his awareness, “communication in construction projects is weak and information is sheared through phone, this method leads to poor or ineffective communication.”

Others, (55%) of the panelists and participants agreed are of that opinion. Panelist number two also agreed with the above and added, project communication is an important task for stakeholders and stated:

“The information on construction projects does not effective and doesn’t reach the right time at the right place, telling that, this is one of the major problems faced in every construction company”.

The perspective of other (26%) panelists and participants were adding on that, project communication around the office is good but communication on project sites is poor, as panelist number three says, communication is partially good.

Panelist number four also agreed that project communication is the foundation for stakeholders to achieve companies' goal and plays a great role to finish a project within the estimated cost, time and quality, adding that:

“Communication between consultant and client is good; especially for the office, they use official letters. When it is far from Bahir Dar City it is difficult to communicate, the information doesn't easily reach the right time in the right place”.

However, other panelists and respondents of (19%) were also adding that, project communication is somewhat good in the organization.

As understanding from participants and panelists of (55%) were of the opinion that, the current situation of communication is poor, especially those projects far from a city doesn't get right information at the right time, and this is a great impact on construction projects.

3.2.2. Familiarity with the communication in the construction projects

The purpose of this question is to ask the panelists and participants how far they are familiar with the project communication in their organization.

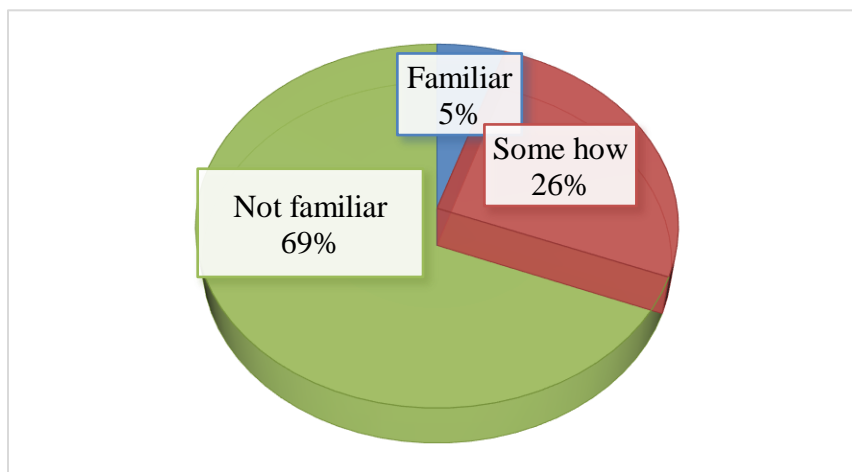


Figure 3.5: Familiarity with communication in construction projects

As clearly shown in Figure 3.5, the majority (69%) of the panelists and participants who were involved in the discussion agreed that they were not familiar with project communication in their

organization. Based on their opinion that project communication is not well implemented and awareness does not given for project communication in construction projects. In addition, oral communication, texting, and communication with the phone was a popular way of communication on their projects.

Other, 26% of the panelists and participants had agreed that, they were somehow familiar with communication in their construction projects. “Panelist number three is also agreed with this idea. Sometimes discussion was made within stakeholders to solve the problems when the communication gap has occurred”. Only 5% of the panelists and participants who were involved in the discussion were agreed that they were familiar with project communication in their organization.

Panelist number two adding that communication between contractor and consultant is good to compare to the other parties.

3.2.3. The role of communication in construction projects

Based on the panelists’ and participants’ opinions that, communication is one of the fundamentals for project success, and it plays a great role in all stages of construction projects. For example, stakeholders throughout the stages of construction should communicate information in the form of drawings and specifications. Therefore, all construction project activities required effective communication between construction professionals. Effective communication creates a bridge between various stakeholders who may have different professions in the construction projects. In addition, communication can contribute to finish the project within the estimated time, cost and quality.

All panelists and participants conclude that the role of communication has been recognized as the encouragement and backbone of project success. They also add that the project communication management was supposed as a strategic tool amongst the stakeholders at all levels of a project that could yield possible success.

3.2.4. The existence of communication systems in organization

As the opinion of panelists and participants agreed that, most of the communication in the construction projects does not use a clear communication system or it was an ineffective system. This has a negative impact on construction project such as de-motivated workforce,

design errors, a slowdown in the entire job and failure in construction. Construction professionals should communicate throughout all construction stages. Hence, there is a need for professionals within the construction industry to properly communicate with each other, for the successful achievement of organization goals.

Based on panelists' view, the scope of the work and details of construction activities were communicated through means of drawings, contract documents, and specifications. Due to this, proper communication system implementation can improve communication in the organization. Per the understanding of panelists' and participants', the appropriate systems and technology should be included in a contract documents to create effective communication.

As understanding from panelists' and participants' communication is fundamental to the existence and survival of construction projects from failure. The communication system was used to create and share ideas to reach people to a common understanding.

3.3.Questionnaire Data Discussion and Analysis

In order to ensure a study, a sample well represented to the targeted population of the Bahir Dar City public building construction projects. The main respondents' were contractors, clients, consultants, and Urban Development and Housing Construction Bureau were included, to reveal their perspective of project communication practice and its impact on the performance of public building construction projects. Questionnaires were distributed to seventy- (70) respondents with hand. Out of the targeted 70 respondents, sixty-five of (65) were returned.

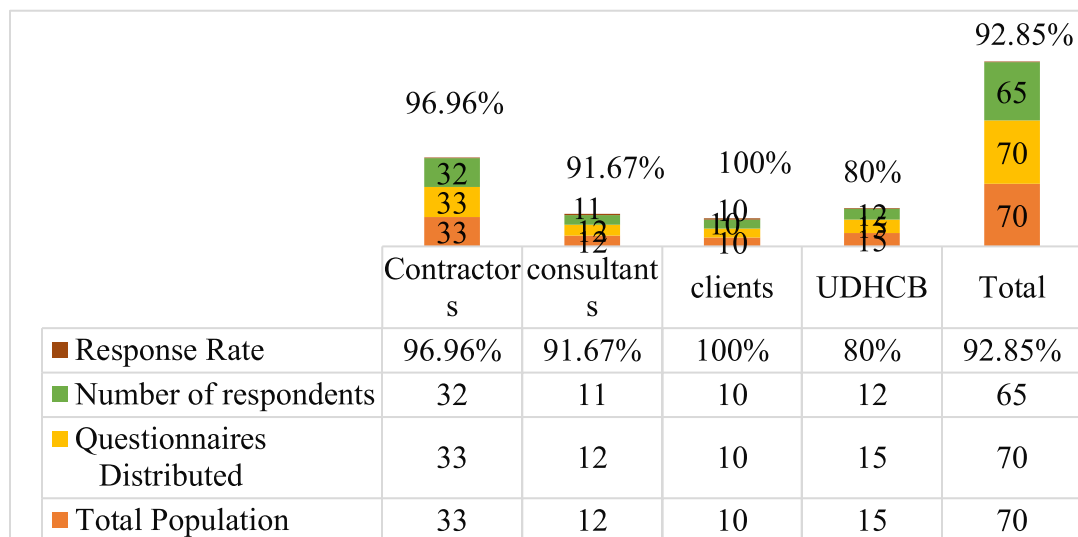


Figure 3. 6: Distributed questionnaires and response rates

The Figure 3.6. Above shown that, the distribution of the respondents' occupation were of that, ten (14.28%) are clients. Twelve (17.14%) were consultants. Fifteen (21.43%) were UDHCB and thirty-three (47.14%) were contractors. From the total seventy-(70) distributed questionnaires, sixty-five were returned. Thirty-two from contractors, eleven from consultants, ten from clients. Twelve are the Urban Development and Housing Construction Bureau. In which a total averages response rate is 92.85%, with a response rate of 96.96% contractors, 91.67% consultants, 100% clients and 80% from the Urban Development and Housing Construction Bureau.

Table 3. 1: Project communication management practices in building construction projects

Project communication management practices in teams	Contractors		Consultants		Clients		UDHCB		All	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Oral communication	0.79	1	0.86	1	0.86	1	0.78	3	0.84	1
Managing technology	0.60	7	0.78	3	0.78	3	0.69	6	0.72	5
Communication technology	0.66	3	0.67	6	0.67	6	0.71	5	0.67	6
Relationship by encouraging team	0.69	2	0.82	2	0.82	2	0.73	4	0.78	2
Communication management strategies	0.63	5	0.77	5	0.77	5	0.81	2	0.72	4
Good public image and public relations	0.64	4	0.77	4	0.77	4	0.82	1	0.73	3
Communications planning	0.62	6	0.59	7	0.59	7	0.64	7	0.6	7

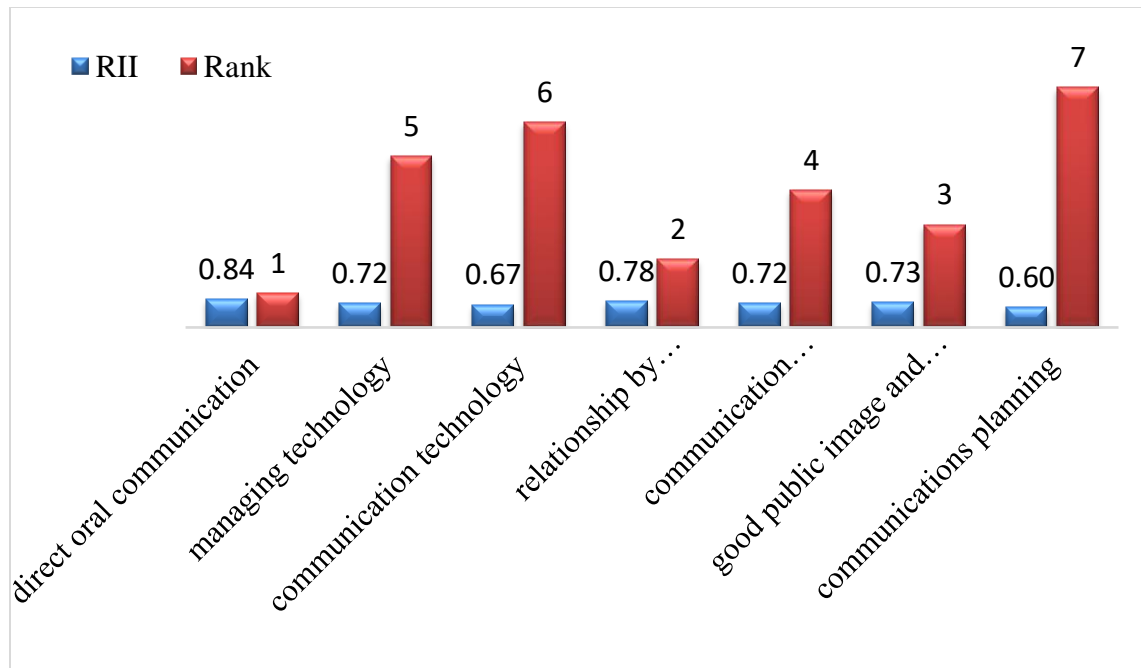


Figure 3.7: Project communication management practices in building construction projects

As shown in Figure 3.7. Above, the ranking of seven-(7) communication management practices in building construction projects. From the above Figure, it is clearly showing that direct oral communication was ranked first with an average relative importance index of 84.0. The relationship by encouraging team was ranked second with an average relative importance index of 78.0. Good public image and public relations ranked third with an average relative importance index of 73.0. Communication management strategies, managing technology, communication technology, and communications planning were ranked 4th, 5th, 6th, and 7th respectively. With average importance indices of 72.0, 72.0, 67.0 and 60.0 followings in that order.

3.3.1. Top five-project communication management practices in building construction projects

I. Direct oral communication

As clearly stated by respondents, direct oral communication was rank first with an average relative importance index of 84.0. Oral communication implies communication through the mouth or expressing information or ideas by mouth. It may be a direct conversation or telephonic conversation. Forms of oral communication are speeches, presentations, and discussions through the staff.

Oral communication has several advantages and disadvantages, compared to written communication; its advantage is fast or immediate communication. During oral communication, the audience must respect the speaker for he/she is the one who has the ideas and knowledge of a particular subject. In oral communication, the speaking attitude should be attractive to hold the attention of the receiver. During oral communication, the speaker should consider qualification, knowledge, experience, and motivation. The language should be simple and understandable to the audience. Therefore, oral communication is not good compared to other communication practices. Because it is not a formal way of communication or not follow the hierarchy.

II. Relationship by encouraging team

Based on respondents' responses relationship by encouraging team was ranked second with an average relative importance index of 78.0. Developing strong relationships with staff helps team members to communicate freely and more effectively. Hence, a good relationship will motivate and encourage stakeholders to work with their strengths.

Effective communication is important to have good human relations among stakeholders. Hence, the stakeholders begin to take shape, pay close attention to the ways in which team members work together.

Therefore, develop positive relationships with the staff and interact with them at work to make a job more enjoyable and creative. Stakeholders working with relationships include; supervisors and project managers, consultants as well as clients, service providers and professional colleagues.

III. Good public image and public relations

Based on the respondents' rated good public image and public relations was ranked third with an average relative importance index of 73.0. Public relations is the practice of managing communication between an organization and its publics. Public relations are to speak out its support in public and it builds up a talking platform to achieve its goals and protect the interests of people.

As per the respondents' view, public relations can be effective and essential in a once the construction project. The major public relations aim is to create a willingness for the organization. Public relations are the management function that establishes and maintains mutually beneficial relationships between parties in the organization. Public relations are a management tool aimed at bringing people together to promote well understanding among teams.

IV. Communication management strategies

According to respondents' rated communication, management strategies were ranked fourth with an average relative importance index of 72.0. Strategic management is a process, which is formalizing, long-term planning, and implementing an organization's future goal definition and achievement.

The communication strategy is the heart of a company to determine the flow of information among managers and workers. A poor communication strategy leads to information problems and making them hard. For example, for managers to monitor employee performance or for employees to understand orders from management.

V. Managing Technology

Based on respondents' rated, managing technology was ranked fifth with an average relative importance index of 72.0. Managing technology involves planning, designing, optimizing, operation and control of project communication in construction projects. It is very important for an organization to manage its communication strategically. Because, if communication is not well managed, it might result in a big loss in the organization.

In addition, technology has an importance in the context of project management, due to greater challenges in construction projects work environment. Hence, technology tools are regularly used for collaboration, effective communication, and distribution of project management practices.

Table 3.2: Communication methods/channels on building construction projects

communication Methods/Channels	Contractor		Consultant		Client		UDHCB		All	
	RII	Rank	RII	Rank	RII	Rank	RII	Rank	RII	Rank
Regular meetings	0.60	10	0.74	7	0.74	7	0.67	8	0.67	8
Telephones	0.86	1	0.86	1	0.86	1	0.8	1	0.84	1
Official letters	0.78	3	0.78	3	0.85	2	0.67	8	0.77	3
Internet	0.67	8	0.67	9	0.67	9	0.62	12	0.66	9
Oral communications	0.82	2	0.82	2	0.82	3	0.78	2	0.81	2
Project Annual Report	0.77	5	0.77	5	0.77	5	0.69	7	0.75	5
Project Status Report	0.77	4	0.77	4	0.77	4	0.73	4	0.76	4

Record management system	0.59	11	0.59	11	0.59	11	0.74	3	0.63	11
Public Relations	0.59	12	0.59	12	0.59	12	0.72	5	0.62	12
Team Meetings Discussions	0.76	6	0.76	6	0.76	6	0.67	8	0.73	6
OBS	0.68	7	0.68	8	0.68	8	0.65	11	0.68	7
Performance evaluation scheme	0.61	9	0.61	10	0.61	10	0.71	6	0.63	10

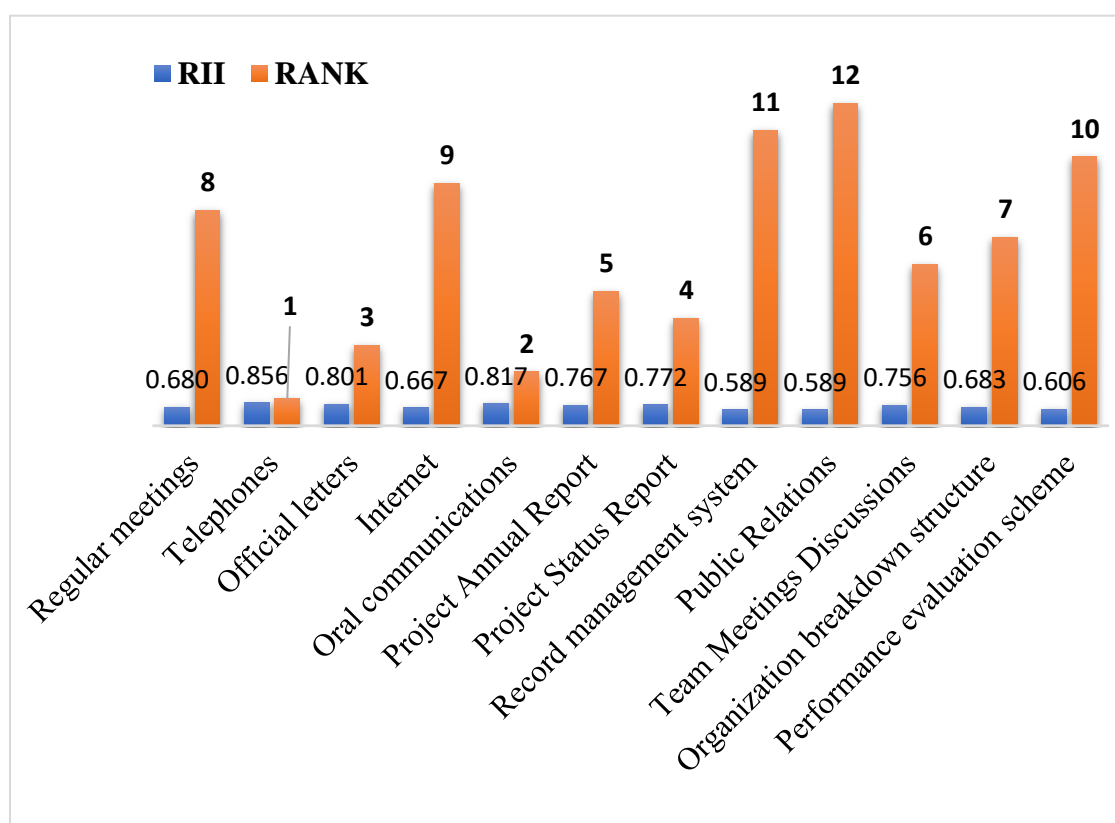


Figure 3.8: Communication methods/channels on building construction projects

As clearly indicated in Figure 3.8, the ranking of twelve (12) communication methods on building construction projects. From the above Figure, it is clearly showing that telephones were ranked first with an average importance index of 85.6. Oral communication was ranked second with an average importance index of 81.7. Official letters ranked third with an average relative importance index of 80.1. Project status report, project annual report, team meeting discussions, organization

breakdown structure, regular meeting, internet, performance evaluation scheme/arrangement, record management system and public relation were ranked 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, and 12th respectively. With average relative importance indices of 77.2, 76.7, 75.6, 68.3, 68.0, 66.7, 60.6, 58.9 and 58.9 followings the ordinal order.

3.2.2. Top five communication methods/channels on building construction projects

I. Telephones

As shown in Figure 3.8. above, it is clearly showing that telephones were rank first with an average relative importance index of 85.6. The telephone is one of the popular communication methods to establish a chain of command. It is vital to control a chain of command for communication in the construction project or on organizations. These are usually required from stakeholders to communicate with each other. Phones are one of the informal methods of communication and having no guarantee in transferring the message. It can lead to employee stress and reducing abilities to manage work task effectively. Hence, using phones is somehow bad and can lead stakeholders to conflict, compared to letters and other formal communication channels.

II. Oral communications

As shown in Figure 3.8, oral communication was the second most method of communication in the organization with an average relative importance index of 81.7. In oral communication, it is important to ensure the listeners clearly understand what information the sender was saying. In addition, it requires strong speaking and listening skills of the communicator. Oral communication is timesaving; when action is required to be taken immediately, it is best to transmit a message orally.

Oral communication has limitations, it needs overconfidence and self-confidence is necessary to communicate orally. However, over-confidence can destroy the objectives of communication. Language problems may be happening; the speaker's language must be understandable to the receiver. Otherwise, the communication may be a failure and having a negative impact on the overall performance of the construction projects.

III. Official letters

As shown in Figure 3.8, official letters were the third most method of communication in the organization with an average relative importance index of 80.0. It is carrying the messages of official matters from sender to receiver. Letters are the most widely and commonly used means of written communication among stakeholders in the organization. The official letter is the type of letter carrying the messages of official matters. An official letter is a good and formal method of communication. Nevertheless, it is a time-consuming method of communication, especially for long-distance or projects far from the main organization. This type of communication is most appropriate for the organization.

IV. Project status report

The project status report is one of the forth most important methods of the communication channels in the organization as shown in Figure 4.7 above. The project status report describes where the project stands at a specific point in time. It is a regular, formalized report on project progress against the project plan. It also keeps project stakeholders to inform of critical aspects of project strength. Such as schedule issues, scope, resources, and cost. In addition, allows management to take action to address project issues and risks. It may be written weekly or monthly. Thus, written weekly reports are an efficient way to communicate all projects, tasks, and progress during a week.

Report the status of project timely make employees to assess their performance and progress to the middle management that can forward those reports to their executives. The objective or aim of having effective project reporting is, in order to improve communication of information within the project and across the organization. Stakeholders should receive the necessary information and forward the information to all staffs to enhancing organizational support for the project.

V. Project annual report

Project annual report is one of the important methods of communication in the organization or on the construction projects. This should be given yearly to motivate site workers and improve the entire project's success. It is also being a comprehensive report on a company's activities throughout the preceding year. Annual reports are suggested to give shareholders and other interested people to give information about the company's activities and financial performance.

The aim of having this annual report can give a lot of important information about a company. The most important purpose of the organization's annual report is to provide shareholders with information on how the company has been performing. Thus, annual report is very essential for an organization in order to minimize claims and poor communication in the project. In addition, annual report can increased the understanding of risks and opportunities in construction projects.

3.4. Statistical Analysis

3.4.1 Validity test

I. Validity test for quantitative data

Validity is determining whether the findings are accurate from the standpoint of the researcher, participants, and readers. Validity primarily takes place in the after data collection stage [66]. The questionnaire is reviewed with a group of experts in the field of the study like contractors, consultants, clients, UDHCB. The collected data were from interviews, observations, questionnaires, and panel discussion.

To ensure the validity of the questionnaire responses there are two statistical tests: criterion-related validity test (Pearson test) and structure validity test. In this thesis, the researcher applied the Pearson validity test. This validity measures the correlation coefficient between one field and all other fields of the questionnaire that has the same level of similar scale. Pearson's correlation coefficients were checked, with the help of the following table.

Table 3.3: Correlation coefficient of each field and the whole of questionnaire

No.	Section	Pearson correlation coefficient	P-Value (Sig.)
1	Communication practices on the construction projects among stakeholders in Bahir Dar City	0.763	0.018
2	Communication channels/ lines on construction projects among stakeholders in Bahir Dar city	0.825	0.026

**. Correlation is significant at the 0.05 level.

As it is indicated in Table 3.3, the values of Pearson's correlation coefficients are more than 0.7 and p -values are less than 0.03. If the p -value is less than 0.05, and the Pearson correlation coefficient is above 0.7, then researchers have evidence of test-retest validity. It is clear that a

high-reliability Pearson correlation coefficient supports the validity of the questionnaires, so the collected data is valid.

II. Validity test for qualitative data

The validity of qualitative data was tested by respondent validation or cross-validation after the discussion of the result and how the collected data is valid with respect to the actual problem in the construction project. Due to this validity test was carried out. The professionals on construction projects were seen as the collected data and results. Among those five (5) interviewees were participated from three (3) construction projects. From their point of view, the following results were gained. Based on interviewees' opinion 60% of communication practices in public building construction projects were similar to the result of findings. Per the interviewees' opinion, 40% of communication barriers/obstacles in public building construction projects were similar with the result of findings. According to the interviewees' opinion, 80% of communication barriers in public building construction projects were similar to the result of findings.

3.4.2 Reliability test

According to Litwin M.S. (2003), Cronbach's alpha measures the internal consistency of a group of items by measuring the homogeneity of the group of items. "It is an indication of how well the different items complement each other in their measurement of different aspects of the same variable or quality". Cronbach's Alpha ranges in value between zero and one. Values closer to one indicate a higher internal consistency; values closer to zero indicates a lower internal consistency [71].

In order to support the view of respondents on communication practice, communication lines and impact of communication in the public building projects in Bahir Dar City. Analyze the questionnaire survey results by using Cronbach's alpha method to arrive at the reliability of the data. Based on this data analysis the value of Cronbach's Alpha was calculated using SPSS software and the results are shown as in Table 4.21.

Table 4.20: Rule of thumb alpha value [68]

α =Range	Remark
$0.9 \leq \alpha < 1.0$	Excellent
$0.8 \leq \alpha < 0.9$	Good
$0.7 \leq \alpha < 0.8$	Acceptable
$0.6 \leq \alpha < 0.7$	Questionable
$0.5 \leq \alpha < 0.6$	Poor
$0.0 \leq \alpha < 0.5$	Unacceptable

Table 4.21: Reliability Statistics for questionnaire

Measuring Group of Variables	Cronbach's Alpha (α)	Number of Items
Communication practices on the construction projects among stakeholders in Bahir Dar City	0.858	20
Communication channels/lines on the construction projects among stakeholders in Bahir Dar City	0.805	12

It is clearly shown from Table 4.21 above, the value of the Cronbach's Alpha in this research was 85.8%, 80.5% and 87.6% for communication practices, channels, and resulting impacts respectively. Cronbach's alpha indicates a high level of internal consistency between the respondents. The data used was collected from contractors, consultants, clients, and Urban Development and Housing Construction Bureau.

To provide answers to the questions based on their personal understanding and experience. This will likely differ from person to person. However, to test for internal consistency, the alpha was 0.858, 0.805 and 0.876, which shows good consistency in the data. The above all Cronbach's alpha lies between 0.8 to 0.9 this shows there is a good one with a value greater than 0.6 considered as good internal consistency.

3.4.3 The correlation between respondents

Table 4.22: The correlation limit [67]

Correlation limit	Remark
00-0.19	“very weak”
0.2-0.39	“weak”
0.4-0.59	“moderate”
0.6-0.79	“strong”
0.8-1.0	“very strong”

Table 4.23: Correlation among respondents on communication practices

Correlation	Contractor	Consultant	Client	UDHCB
Contractor	1			
Consultant	0.917	1		
Client	0.830	0.696	1	
UDHCB	0.76	0.71	0.67	1

As shown in Table 4.23, the correlation between respondents on the communication practices in public building construction projects. The correlation between contractor and consultant is 0.917 (91.7%). This suggests that there is a very strong positive association between the two respondents. This shows also, there is a very good communication between two parties. The correlation between contractor and client is 0.83(83%), this suggests that there is a very strong positive association between two respondents and the correlation between contractor and UDHCB is 0.76(76%) this also suggests that there is a strong positive association between two-respondents. This shows also, there is a good communication between two parties.

The correlation between consultant and client is 0.696(69.6%); this suggests that there is a strong positive association between the two respondents. The correlation between consultant and UDHCB is 0.71(71%); this shows there is a strong positive association between two respondents. The correlation between client and UDHCB is 0.67(67%); this shows there is a strong positive association and strong communication between two respondents.

Table 4.24: Correlation between respondents on channels /lines of communication

Correlation	Contractor	Consultant	Client	UDHCB
Contractor	1			
Consultant	0.854	1		
Client	0.821	0.677	1	
UDHCB	0.78	0.85	0.749	1

From Table 4.24, the correlation between respondents on channels/lines in the public building construction projects. The correlation between contractor and consultant is 0.854(85.4%). This suggests that there is a very strong positive association between the two respondents. This shows also, there is a very good communication between two parties. The correlation between contractor and client is 0.821(82.1%) this suggests that there is a very strong positive association between two respondents. This shows also, there is a good communication between two parties.

The correlation between contractor and UDHCB is 0.782(78.2%) this also suggests that there is a strong positive association between two respondents. This shows also, there is a good communication between two parties. The correlation between consultant and client is 0.677(67.7%) this also suggests that there is a strong positive association between two respondents. The correlation between consultant and UDHCB is 0.853(85.3%). This suggests that there is a very strong positive association between two respondents. The correlation between client and UDHCB is 0.749 (74.9%) this suggests that there is a strong positive association between the two respondents. This shows also, there is a good communication between two parties.

3.5. Comparison between semi-structured interviews, panel discussion and survey analyses results

The analyses above clearly show that most of the interviewees were agreed that, there are poor/weak communication practices in the construction projects. According to the interviewees' opinion, communication was not effective. There is a problem in the organization and the communication method/line they follow was informal communication mostly. They also said that communication was an impact on the organization. As per their opinion of interviewees, project communication is improved through; sharing international practices, stakeholders' collaboration

in the work, applying modern project management on communication. Additionally, it is improved through giving training for professionals, using proper channels for project communication, establish an effective project communication plan, using effective meetings and ask honest feedback.

As understanding from the panelists and participants, who were involved in the discussion, the majority of them agreed that the current situation of project communication was poor. Project communication does not well implemented and awareness does not give for project communication in the construction projects. Oral communication/face-to-face communication and short message service/text were the popular communication channels in their organization. Based on the respondents' opinion, the communication practices were poor as interviewees and panelists. Oral communication was rank first or most used in construction projects. The top five mostly used communication channels/lines those practiced in construction project were; telephones, oral communication, Official letters, project status report and project annual report. In general, as the interviewees and panelists' opinion regarding on the above issues are nearly the same response on the research questions.

4. Conclusions and Recommendations

4.1. Conclusions

1. The analysis and discussion revealed that, the current communication practice in the Bahir Dar City building construction projects is poor and it needs serious attention in order to improve the construction industry. The questionnaire survey, semi-structured interviews and group panel discussion also confirmed that:
 - The communication practice in the construction companies are less effective and less awareness given for project communication in the organization.
 - The top five communication practices in public building construction projects were oral communication, relationship by encouraging team, good public image, communication management strategies and managing technology.
 - The majority of construction companies have no well-established communication plan and not use communication model in their construction projects.

2. The second specific objective was to assess the communication lines followed on public building construction projects within the dimension of international practices in Bahir Dar City.

Based on the analysis and discussion:

- The majority of construction firms use informal communication methods rather than formal communication in their construction projects. The top five channels/lines of communication in the organization were: telephones, Official letters, project status report, project annual report, team-meeting discussions.
- The majority of construction firms do not following a clear communication line or channel in their construction projects.
- The majority of construction firms uses less communication technology and uses less modern communication management techniques to manage communication.

3. The third specific objective was to assess the ways of improving communication method on public building construction projects in Bahir Dar City. Based on the analysis and discussion:

- Based on the findings, communication has an impact on building construction projects and influence the entire project progress, leads to poor teamwork, conflict among parties, rework and redesign occurrence, misinterpretation and misunderstanding among project teams.
- The suggested ways to improve communication in the project is using clear communication line, using communication plan, using a communication model and determine the number of channels in the organization, strong organizational structure, and experience sharing.
- Finally, based on the respondents' opinion regulatory bodies provide viable solutions to improve project communication by, improving project communication practices, through continuous training and appropriate procedure for stakeholders allocate sufficient time for communication and allocate the appropriate fund towards that.

4.2. Recommendation

- The researcher recommends that, in higher education institutions, project communication should be given as course work in all relevant programs.

- Stakeholders in construction projects should follow formal communication rather than informal method and give an attention for effective communication.
- The top management in the construction firms should develop communication management manual, understand its implementation, and prepare a communication plan for the organization.
- Construction companies should use a clear communication channel to avoid misunderstanding between stakeholders in construction projects.
- The key stakeholders should realize that project communication is the foundation for the successful completion of projects.
- Finally, the Ministry of Urban Development and Construction Bureau should improve project communication guidelines and code of conduct.

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