



ADDIS ABABA UNIVERSITY
ADDIS ABABA INSTITUTE OF TECHNOLOGY
SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING

STUDY ON LABOR BASED CONTRACTS IN ETHIOPIAN CONSTRUCTION INDUSTRY;
THE CASE OF BC3 AND ABOVE SELECTED BUILDING CONTRACTORS AROUND
ADDIS ABABA

BY
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Declaration

I the undersigned, declare that this project entitled “**STUDY ON LABOR BASED CONTRACTS IN ETHIOPIAN CONSTRUCTION INDUSTRY; THE CASE OF BC3 AND ABOVE SELECTED BUILDING CONTRACTORS AROUND ADDIS ABABA**” is my original work and has not been presented for a degree in any other university, and that all sources of materials used for the project have been duly acknowledged.

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ABSTRACT

The construction industry in Ethiopia is faced with a lot of challenges ranging from project inception to hand over one of the main challenge in the execution of construction projects is construction method of delivery and an ever increasing project undertakings of labor-only contract and direct labor contract. This study therefore compares the performance of labor-only and directly employed contracts in Addis Ababa .Present construction projects in general are becoming highly capital intensive.

In recent years, the application of labor-based methods with employing equipment's in building construction has been initiated due to its assumed economic advantages for owners. However, there are inevitable doubts, especially among engineers and project planners, as to the feasibility of the labor-based methods. Whether it would be possible to apply these methods without sacrificing quality standards, what effect they might have on the pace of construction, what additional strains they might place on scarce managerial resources, and of course, what the comparative cost would be.

This labor based construction approach gained popularity late last century because it was seen as a clever way to cut costs. Many property owners naively believed that project management was a straightforward exercise they could do in their spare time, and this enabled them to avoid paying the margin to the builder that he would otherwise receive for performing this function.

The study focused on Addis Ababa region labor based construction projects and contracts, for this study questioners and interviews were conducted as well as results and discussions based on the scientific analysis were drawn based on the analysis and observed data.

The results show that, therefore, recommends that the use of the labor-only procurement system should be encouraged among construction participants trying to achieve small construction projects within the available budget. However, care must be taken while adopting this procurement option for high capital and very technical projects. Because these projects might need well skilled man power, Since Controlling, quality of construction materials and risk associated with the construction projects is very hard to manage for large projects.

Keywords

Labor base contract, project management, Outsourcing, Subcontracting, Employment, Regulation, ILO, WB,AD,,AAIIDCP



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Abbreviations

- AAIIDCP – Addis Ababa City Integrated infrastructure development and construction permit control Authority
- AAiT - Addis Ababa institute of Technology
- ADB - African Development Bank
- ASCE - American Society of Civil Engineers
- CICE –Construction Industry Cost Effectiveness
- CII – Construction Industry Institute
- EC - Ethiopian Calendar
- ERA - Ethiopian Roads Authority
- MoUDC- Ministry of Urban Development and construction
- ILO – International Labor Organization
- WB – World Bank



CHAPTER ONE

INTRODUCTION

Labor only building contract is an arrangement whereby the builder contributes workforce to the building project, but instead of taking overall responsibility for it, he merely works by employing tradesmen. He is told to leave the selection and procuring of the building materials, and the coordination, supervision and quality control of the project to the property owner, developer or group home building company.

Unfortunately, management of a building project is way beyond the capabilities of a part-time, inexperienced amateur. Consequently, one of two things tended to happen. Either the project became like a sailing ship aimlessly drifting through the waters without a rudder and without a captain. Or, realizing that the project was likely to turn to custard if he didn't do something, the builder voluntarily assumed the role of project manager – and all the potential liability that went with it.

The basis on which labour is engaged in the construction industry has profound implications for productivity, quality and skill development. These are issues of direct interest to construction managers, as well as to those concerned with the broader development of the industry.

The purpose of this research is to investigate the Assessment of labor with equipment-based contracts in Ethiopian construction industry by taking in to account building projects, which are being undertaken in the city of Addis Ababa by Grade 3 and above contractors.

1.1 STATEMENT OF THE PROBLEM

The main reasons under which this research was necessary is to study in detail below:

- The increasing undertaking of labor based construction projects by higher-grade contractors to the contradiction of the general construction lifecycle.
- Lack of project management and coordination in the overall project cost, time and quality for contracts entertained in this category.
- The need to reinforce contractual obligation on the contractor's side for the supply of quality materials by the client.
- The absence of well-documented researches in the Ethiopian construction industry context.
- Lack of awareness by clients, financiers and contractors to labor based construction trends in terms of accountability and construction contract risk management.



1.2 RESEARCH SIGNIFICANCE

Depending on the research objectives the outcomes of this research is believed to mainly benefit the construction industry and any other interested stakeholders in:

- Conducting quantitative analysis in this construction method of delivery is helpful to allocate reasonable contingency for the identified risk and causes of delays.
- The technical and economic feasibility of labor based construction methods will be analyzed in detail to enhance the level of awareness on this method of construction delivery.
- The analysis of projects constructed under this method of delivery will be evaluated based on terms of project cost , time and quality
- The successful completion of this thesis will highlight scope type and purpose of insurance in this method of construction delivery will help to analyze the respective responsibilities of the client, the contractor, the consultant and the insuring party.

1.3 RESEARCH QUESTIONS

- Why does many individuals, real estate developers, public and foreign investors have been engaging in the labor based construction contracts.
- Is Labor-based approach is an effective and efficient method of achieving the target project objectives?
- What is the current trend of labor based contracts in building constructions in higher grade contractors.
- How does the Supply chain and project management are being entertained in building construction projects?
- How does risks and responsibilities arise out of the construction lifecycle are shared among project stakeholders in the labor-based contracts.



1.4 OBJECTIVES

1.4.1 General objectives

The general objectives of this research paper are :

- to study the type of contracts that is being used in projects under this study specifically with contracts on high grade contractors in Addis Ababa.
- to analyze Performances, challenges and prospects of labor based contract system in Addis Ababa.
- to assess how labor based contractors actually take account of risks in the life cycle of the construction project.
- to analyze the issues of health and safety and contractual obligations of the client the contractor and the consultant (if there is any).

1.4.2 Specific objectives

The specific objectives of this research paper are :

- to perform a quantitative analysis on the practices of labor based contract in Addis Ababa city.
- to assess how the statutory requirements of construction contracts are being entertained in the labor based construction in Addis Ababa.
- to study the extent where developers in Addis Ababa city engage in labor based contracts delivery system.
- to comment on the contract type, form and method of delivery and contractual requirements of grade one contractors engaged in labor based contracts.
- to assess contractual provisions related to contractors power, duty and responsibility; price adjustment; termination; claim substantiation and dispute settlement procedures; regarding labor based building contracts in Addis Ababa town.
- to propose a standardized system or a way, which can lead both parties to have a clear and well-organized labor-based building construction contract.



1.5 Organization of the research

The research is organized in five chapters and appendices:

➤ Chapter - 1 Introduction

It contains the background of the labour-based construction system. It also describes in detail the research motivations, statement of the problem, research questions, objectives, significance, scope and limitations of the study and organization of the research.

➤ Chapter - 2 Literature Review

This section covers literature review, and comprises the various related works mainly focusing and analyzing issues associated with labor-based construction; best practices and case studies related researches and needs of the industry.

➤ Chapter - 3 Research Methodology

Here the chapter includes the research methodology as one chapter, including the research approach, scope of the study, research design, sampling technique, data source and collection methods plus data analysis and interpretations.

➤ Chapter - 4 Data Analysis and Discussions

This part comprises the analysis, discussions and evaluation part.

➤ Chapter - 5 Conclusions and Recommendations

The last stage of the research covered the conclusions of the research together with recommendations.

Finally, references and appendices are included.



CHAPTER TWO

LITERATURE REVIEW

2.1 Building construction projects

A construction in simple words is a process of constructing something by human for one purpose or another. It may be a road, bridge, a dam, a private residence, an airport, a commercial building, etc. According to Wikipedia, construction is a process that consists of the building or assembling of infrastructure. Construction is the recruitment and utilization of capital, specialized personnel, materials, and equipment on a specific site in accordance with drawings, specifications, and contract documents prepared to serve the purposes of a client. According to Ashong, K. (1993), construction contributes to the economic development of any country by satisfying some of the basic objectives of development including output generation, employment creation and income generation and re distribution; it plays a major role in satisfying basic physical and social needs, including the production of shelter, infrastructure and consumer goods.

A project is a temporary endeavor undertaken to create a unique product, service or result. According to Beards worth, (1998), all projects are risky and there are three separate reasons for that. The first reason is that all projects share common characteristics, which inevitably introduce uncertainty. Some of this common characteristics are projects are unique, complex, involve assumptions and constraints, performed by people and involve change from a known present to an unknown future. The second reason is that all projects are undertaken to achieve some specific objectives. The final reason is that the external environment they exist in affects all projects.

The construction industry is a very important part of any country. It highly contributes to the growth and development of the economy in developing countries like Ethiopia, Ashong, K. (1993). According to these studies, the construction industry plays a major role in developing countries since it constitutes a significant portion of Gross national product and employment; at least three-quarters of the world's construction workers are in the less developed countries.

Further relevant studies in the area also state that construction workers in the less developed countries are more exposed to accidents and endure much poorer terms and conditions of work than workers in the developed countries. According to the previous researches in the area, the construction industry has a poor report image due to poor construction and inadequate inspection. The report says this poor image is directly a result of the nature of the work, which is difficult and dangerous.



2.2 Construction in Ethiopia

According to Building research advisory board report (1978), the most important thing that can be done in projects is make sure that the inevitable risk associated with every project is at a level which is acceptable by the organization and is effectively managed. This statement implies that different organizations have different risk acceptance levels and Ethiopia as a country or the organizations involved in construction can only afford to accept small levels of risk due to their low capital. This implies risk management is especially important in developing countries to avoid loss and make the projects more successful.

These operate in the different sub-markets characterizing the construction industry. Construction firms must be registered and licensed by the Ministry of Works and Urban Development in order to undertake any construction work in Ethiopia. There are different requirements that need to be fulfilled by qualified professionals before getting a license to undertake construction projects.

The Ministry of Works and Urban Development (MoWUD) classify the firms according to size, expertise and financial capability. The professional services sector consists of architects, civil engineers, electrical engineers, sanitary engineers, and mechanical engineers, quantity surveyors and surveyors who provided the design expertise. Construction firms are broadly classified based on trend of work as follows:

General Contractors, Building Contractors, Road Contractors and Specialized Contractors. The first three categories are again divided into ten grades with different resource requirements. Consultancy firms are broadly classified as follows: CA – Consultancy Architects, CAE – Consultancy Architects and Engineers, HBC – Consultancy Highway and Bridge, CE – Consultancy Engineers and SC – Specialized Consultancy. All of the above consultancy firm categories are divided into six grades with different resource requirements.

According to the Ethiopian ministry of construction report(2018,) currently there are over 6000 contractors, out of which only 160 are grade one contractors. The number of consulting firms has reached 287 and among these, only 20 are grade one-consultancy firms with CAE license. This number is very small compared to the total population of the country. As discussed earlier, construction is very important tool for development of any country and the number needs to increase to help achieve the desired development.

As mentioned above, the Ministry has placed the basic human and equipment requirements to attain different licenses with different grades i.e. only when these conditions are fulfilled can the people or companies be allowed to practice the profession. However the current practices of labor based constructions in Ethiopia neglect this qualification requirements and relay on the



client as a shield to provide the necessary materials, financial resources and schedules to work on the scopes and quality standards prescribed by the client ,which in most cases doesn't have any construction and engineering background .

This creates a constraint in maintaining quality of work defies the critical procedure of activity durations and draws back an anchor on the construction industry by prohibiting the growth of the contractors and consultants.

2.3 Project delivery systems

2.3.1 Force Account

When the project owners engage themselves to undertake the project, it is called a force account delivery system. According to Zewdu T, ., often such a system is promoted if the Project Owners believe that there is a comparative advantage in Cost, Time and Quality issues. And when there is a lack of capacity from the private sector to undertake very large and technologically new projects, public companies do undertake such projects using Force account delivery systems.

As described in Addis Mesfin(2014), this type of delivery system is often used when projects are small and places are remote such that reaching them is difficult and in general, when they are not attractive enough to call the attention of Bidders.

2.3.2 Design-Bid-Build (D-B-B)

After the project owner prepares the basic plan that identifies construction project program, they call upon the participation of design/ supervision consultants. These consultants will carry out the design and the necessary tender documents, which will be the basis for selecting contractors. Here the design and the construction are performed by two separate parties. Cristian P., et al, states that the most outstanding character of DBB, also called the traditional approach, is that the procedure of the project construction has to follow the order of Design Bid Build, i.e. only when the former has finished, the later can start. Chan, (2002).

2.3.3 Design-Build (D-B)

Design build delivery system is also known as “turnkey”. The term turnkey indicates that the system is delivered to the client ready for operations. The project is largely contractor managed and the cost and control of risk are weighed towards the contractor and away from the owner. , in this type of contract delivery system, both the design and construction liability rests with the contractor. On the other side, the owner's ability to control the project is low.



According to Bunni, N. G. (2003), some of the disadvantages of this turnkey delivery system are; the owner's ability to control the project is low and the contract price is relatively high. The contractor carries a lot of risk in this type of delivery system and if these risks are not properly managed, they can lead to bankruptcy of the company in addition to not achieving the project objectives.

2.3.4 Finance / Build Operate Transfer (BOT)

BOT is a form of contract delivery system that promotes public private partnership in which a private company is contracted to finance, design, construct and operate for a certain period (usually 10 years) and transfer the facility for to the project owner As presented by AdisMesfin in (2014).

2.3.5 EPC – Engineering Procurement Construction

In this type of contract delivery system, the engineering and construction contractor will carry out the detailed engineering design of the project, procure all equipment and materials necessary, and then construct to deliver a functioning facility or asset to their clients According to Cristian P. et al, this kind of delivery system is also known as turnkey project service to indicate the system is delivered to client ready for operation. The project is largely contractor managed, i.e. the contractor holds all of the responsibility and the risk involved is weighted towards the contractor and away from the owner.

2.4 Major Types of Construction Contracts

2.4.1 Definition of Construction Contract

A construction contract is a contract specifically negotiated for the construction of an asset or a combination of assets that are closely interrelated or interdependent in terms of their design, technology and function or their ultimate purpose or use. AdisMesfin ,(2014)

I. Lump Sum Contract

In this type of contract, the contractor offers to do the whole work as shown in drawings and described by specifications, for a total stipulated sum of money. Lump sum contract are typically used for buildings. The qualities of the materials required can be calculated with sufficient accuracy during the bidding process to allow contractors to submit a single lump sum price for the work.

A lump sum contract is more suitable for works for which contractors have prior construction experience. The experience enables the contractors to submit a more realistic bid. The contractor carries some cost risk since it has to carry out the work it has agreed to with the fixed lump sum.



II. Unit Price or Bill of Quantity

In this type of contract, the contractor undertakes the execution of work on an item rate basis. The amount to be received by the contractor depends upon the quantities of various items of work actually executed. The payment to the contractor is made on the basis of detailed measurements of different items of work actually done by him.

This type of contract involves small risk to the parties since the payment is according to the amount of work required and hence, it is mostly preferred by most parties involved in the Ethiopian building construction projects.

III. Lump sum and scheduled contract

This is similar to the lump sum contract but schedule of rates is also included in the contract agreement. In this type of contract, the contractor offers to do a particular work at a fixed sum within a specified time as per plans and detailed specifications. The rate for various items is also provided which regulates the extra amount to be paid or deduced for any additions or deletions made during the progress of work. Any extra items of work are required to be measured for payment.

IV. Cost plus

Cost plus, also known as cost reimbursable, contracts are used in situations that make it difficult or impossible for either the owner or the contractor to predict their costs during the negotiation, bid, and award process.

Cost plus contracts take many forms, the most common being cost plus fixed fee and cost plus a percentage. Most owners prefer cost plus fixed fee because then the amount of profit the contractor will earn cannot increase, thereby removing any incentive for the contractor to increase the cost of the project in hopes of increasing his profit.

V. Cost plus Fixed Fee Contact

Cost plus fixed fee contract is desirable when the scope and nature of the work can at least be broadly defined as presented by Addis Mesfin(2014) . The amount of fee is determined as a lump sum from a consideration of the scope of work, its approximate cost, nature of work, estimated time of construction, manpower and equipment requirements etc.



VI. Cost plus Percentage of Cost Contract

In this type of contract, the contractor's fee is given by certain percentage of the actual cost of construction. The actual cost construction is reported by the contractor and the payment is made to him by the owner together with a certain percentage as agreed earlier. In this type of contract, the contractor has a tendency to increase the cost of work in order to earn more profit. This is the major disadvantage of this contract type.

VII. Labor-only contract

When the builder works for you on a labor-only contract you manage the whole process and the builder is only responsible for building. Clients take this option in the belief that they will have better control over the building process or because they want to save money. With this type of contract the client either pays your builder by the hour, by the week, or a setprice. Paying a set price will be incentive for the builder to work steadily to finish the job in a reasonable timeframe as the job would have been priced on a set number of hours.

2.5 The technical and economic feasibility of labor based methods.

Labor-based construction projects methods mostly on human muscle and skill, and little on equipment, differentiating them from other methods. In theory, the potential mix of labor and equipment spans the full spectrum with procuring construction materials for the projects, with no clear boundary between the two methods. For developing as well as industrial countries, the appropriate construction methods are found somewhere between the two extremes—100 percent labor intensive and 100 percent equipment-intensive—and depend on the socio-economic environment and the task. In practice, the combinations of labor and machinery that are used depend on whether the technology is labor-centered, in which labor is the central resource and equipment plays a supporting role, or equipment-centered, in which the opposite holds true.⁴ In this paper, labor-based methods refer to those that use labor and light equipment as the predominant mode of production and equipment-based methods refers to using heavy equipment and a few laborers (that is, machinery operators) as the predominant mode of production.

2.5.1 A Brief History of Labor-based Methods

The World Bank and the ILO were among the first international agencies to encourage developing countries to adopt a labor-based technology in the road and development sector. Although labor-based methods were used in the colonial era, by the 1960s most government officials and private firms in developing countries had a distinct capital-intensive bias. This had occurred even though these countries were labor-abundant and capital-scarce. The ILO and the World Bank blamed this bias on government policies that subsidized the cost of imported



equipment and set wages above the marginal productivity of labor (Sadli 1974:368). These policies, they explained, made equipment-based methods appear cheaper than labor-based methods. The ILO and the World Bank argued that labor-based methods were justified on social and economic grounds and, later, that under certain conditions they were actually more competitive financially.

2.5.2 Economic and Social Justification

Labor-based methods were justified socially because they would reduce rural unemployment by providing jobs on the road sites. The need to address unemployment had become critical in the 1960s and 1970s. In 1971 widespread unemployment in Sri Lanka was linked to an eruption of violence; in Tanzania urban migration caused social unrest, leading the government to forcefully remove unemployed workers from the cities. Researchers blamed this unrest on the migration of the rural underemployed to the cities, which were not capable of absorbing them into the labor force (Edwards 1974:4). Two factors made rural areas less attractive than urban areas: the increasing population growth in rural areas and the tendency of government to concentrate infrastructure and industry in cities, Labor-based road rehabilitation was one means of resolving both the need for rural employment and the urban bias in infrastructure investment.

Labor-based methods were economically justified because, when the financial prices for labor and imported equipment were replaced with their shadow prices, labor-based methods were shown to be less costly than equipment-based methods.' Shadow prices were used during the early 1970s because distortions in wages, caused by minimum wage legislation and in equipment costs caused by artificially low foreign exchange rates, made labor-based methods appear more costly than equipment-based methods. In addition, labor-based methods reduced a country's expenditures on imported equipment, therefore reducing dependence on scarce foreign exchange, and avoided delays in procuring imported spare parts (World Bank 1991).

Based on these social and economic justifications, the World Bank and the ILO designed labor based programs for public sector force account units. These organizations initially focused on the public sector rather than the private sector because distorted factor prices in the economy made equipment-based methods financially cheaper than labor-based methods for private sector firms, and many African countries had not yet developed local private sector capacity for contracting road works For example, in Botswana, Kenya, Lesotho, and Malawi the government road agencies carried out all aspects of construction, rehabilitation, and maintenance themselves.

Equipment-based methods, when properly executed, also are capable of achieving a better riding surface than labor-based methods, which is important for heavily trafficked roads. Equipment-based methods minimize labor management problems because these methods typically require



about ten permanent laborers per gravel road while labor-based methods require more than 100 casual laborers per gravel road (Edwards 1974; Edmonds and Miles 1984:30).

Experiences with labor-based programs in Asia have shown them to be plagued by problems of poor supervision, corruption, and low worker motivation (Riverson and others. 1991). Government officials who supervise the sites have added phantom workers to the payroll in some cases, and many projects have been referred to as “make-work” projects because worker productivity has been so low (Gaude and Watzlawick 1992; Bruton 1974).

Equipment-based methods may also have political benefits because government officials can quickly mobilize equipment to do work for their supporters, whereas labor is more difficult to mobilize. Before elections, top government officials in one Southern African country used government tractors to plow farmers’ fields and thus garner votes⁴ In addition, equipment-based methods offer more opportunities for rent-seeking since engineers and other civil servants have more contact with established contractors and can gain the benefits of such a relationship.

Equipment-based methods also require less working capital, which is a concern for most cash-poor governments. Finally, equipment-based methods can command more funding than labor-based methods if donors will only finance the foreign exchange costs of a project (Tandler 1979a). Therefore, governments that are aiming to maximize donor contributions will find labor-based projects less attractive than equipment-based projects.

2.5.3 Smaller Firms Vs. Large Firms at Managing Labor

Labor-based methods can only be competitive with equipment-based methods if labor is managed well. As one Indonesian government official concluded, “reasonable levels of labor productivity” are crucial to the success of labor-based programs (Sadli 1974:369). An ILO technical advisor warns that if planners believe such skills to be lacking in a country, they may choose equipment based methods, for which they can draw on international expertise. Statements tying the competitiveness of labor-based methods to labor productivity are not new. Hirschman was one of the earliest theorists to raise this point. He argued that African managers viewed their supervisory role as “new, unfamiliar, and perhaps somewhat uncongenial” and, therefore, were incapable of motivating workers. Thus; he concluded that developing countries would have a comparative advantage in industries that do not require well-trained managers to motivate workers. For example, these countries will be better at smelting than at construction, because, in smelting, the machine can play the role of the manager in motivating the workers to keep a steady pace. Hirschman’s conclusion implies that managers in developing countries are incapable of motivating workers to be productive Is this so?

In their efforts to demonstrate the competitiveness of labor-based methods, the ILO and World Bank have focused on the issue of labor management. Their approach to increasing labor



productivity has been two pronged: institute a payment system that will motivate labor and increase productivity, and train site managers.

2.5.4 Changes in the payment system

Kilby (1961) was one of the first researchers to attribute low labor productivity to lack of financial incentives. In his work, he implies that if managers changed the payment structures, African workers would become motivated, and productivity would rise. One such payment system is the task-rate system, whereby laborers are paid a daily wage for completing one task. Several studies conducted in the 1960s and 1970s suggest that a task- or piece-rate system increases worker motivation, and hence worker productivity.⁷ For example, a study of Indian road construction workers, found that piece-work payment was associated with production levels 24 to 69 percent higher than work that was remunerated on a time-rate basis; that is, with daily wages (World Bank 1974). Another study by the ILO in Nigeria and Tanzania confirms this result (Horton and King 1981 cite ILO 1963). These studies have led the ILO to support the task-rate system as the payment system of choice for labor-based programs. Although the ILO cannot dictate what payment system contractors must use after they have completed training, the ILO required contractors to employ laborers on a daily task-work basis and to agree with a training supervisory officer on a task level during training (Osei-Bonsu 1992).

2.5.5 Why Large Contractors are Not Successful at Managing Labor Based construction projects as Small Contractors

The Ghanaian labor-based program has accepted many different types of participants: small house-building contractors, former civil servants, entrepreneurs from other sectors, and some small and large equipment-based road contractors. Of all the participants in the labor-based program, the large equipment-based road contractors have the poorest record for speed and quality, while the small contractors have been able to manage their sites well. The reasons for this distinction are twofold: large equipment-based contractors undertake many active projects simultaneously, and large equipment-based contractors have little incentive to learn how to manage labor well.

A large equipment-based contractor, for example, may have a bridge project in one district, a rehabilitation project 30 km away, and a maintenance project somewhere else. Large equipment based contractors work this way because it helps them cope with the common problem of getting paid late. If a payment is delayed for one project, they can transfer, or “swap,” payments from another project. This strategy works well when all the ongoing projects are equipment-based because the sites employ only a handful of permanent laborers to operate the machines. This strategy does not work as well, however, when one of the many ongoing projects is labor-based.



Because labor-based sites, with their hundreds of casual workers, require a great deal of supervision. By working on several projects at once, the contractor may be forced to neglect the labor-based road site. Moreover, if a contractor wins a large equipment-based contract; while executing a small labor-based contract, his focus will turn to the equipment-based site because larger losses or larger gains will be made. While Small firms, in contrast, execute only one project at a time and can thus provide high levels of supervision; some contractors visit their sites almost every day, and some, three times a week. The contractor who had the highest speed for rehabilitation visited his site every day, even though it was difficult to reach from his home.

This important aspect of comparing labor-based and equipment-based methods is overlooked by the current analysis.

Large equipment-based contractors have little incentive to learn how to manage labor well because their equipment holdings make them eligible to tender for large contracts that are barred to small contractors and when there are no large contracts available, they can still use their equipment to underbid smaller contractors as long as the project site is not too remote. Although, the ILO demonstrated that labor-based methods were 25 percent cheaper than equipment-based methods during the pilot project, this figure does not differentiate between fixed and variable costs. Large equipment-based contractors have high fixed costs and low variable costs, while small labor-based contractors have low fixed costs and high variable costs; for small contractors wage payments often account for 40 percent or more of total costs. Thus, even if labor-based methods are cheaper than equipment-based methods overall, large contractors using equipment based methods can tender a lower price for a small rehabilitation project than can labor-based contractors. As long as large equipment based contractors can at least cover their variable costs (that is, costs for fuel, oil, tires, maintenance of equipment, spare parts, and equipment mobilization), they will tender for the project rather than sit idle. Although large firms would only be able to underbid labor-based firms for a short time (or they will be unable to replace their equipment stock), this behavior is not unusual when there is a reduction of work available in the sector. Thus, because large contractors can be competitive for most small contracts using their equipment, at least on a short-term basis, they have little incentive to learn how to manage labor well. It is this fear of larger equipment-based firms underbidding labor-based contractors that has caused donors to continue to protect the labor-based firms from competing with equipment based firms.

If large contractors can compete for small projects using their equipment, why are they signing up to learn labor-based methods as part of the labor-based program? Large contractors have shown and continue to show interest in the labor-based program. This is because; it assures them continuous work for four years (the duration of the hire-purchase repayment schedule) at a time. When both large and small equipment-based contracts have become extremely competitive, many equipment-based contractors has tendered for a contract in a certain project to fill bridge



approaches for relatively small project budget. However, large contractors' interest in the labor-based program is only temporary; they see small labor-based contracts as only secure "fill in" work and plan to return to equipment-based methods once more equipment-based contracts become available.

For these reasons, the donors started to exclude prominent equipment-based contractors from the program in 1988. For small contractors, unlike their larger counterparts, labor-based methods are more competitive. Small contractors either own no equipment and must rent from the market at high rates or own old, poorly maintained equipment that frequently breaks down. For these contractors the variable costs of using equipment will be greater than the cost of using labor so long as they can manage labor well. Thus small contractors have an incentive to learn to manage labor well.

2.5.6 Quality and Suitability

In the international level Labor-based methods have shown the capacity to produce satisfactory results as amply demonstrated by the Upper Ganges Canal, the first German Autobahns, the Trans-American Railway, and the SardaSahayak Canal.

Basic construction activities can be categorized as either:

- I. equipment-based, in which labor substitution is not technically feasible;
- II. labor-based, in which equipment substitution is not technically feasible; or
- III. An activity that can be carried out with either equipment or labor .

Activities for which labor-based methods produce better quality results than equipment-based include: creating embankments on very soft ground, producing drainage systems, undertaking shallow excavations with a high water table, selecting materials when excavating, exploiting small quarries, and performing routine maintenance on gravel and earth roads. In terms of suitability or ease of production, labor is better suited to produce the longer-lasting trapezoidal drains than is equipment, which can often produce only V-shaped drains. In addition, labor-based methods are more suitable for rehabilitating and maintaining narrow, winding roads in densely-populated urban areas, because bulldozers cannot maneuver well in such situations.

Contractors in South Africa, for example, use labor when constructing side roads on site-and-service projects, because beneficiaries purposefully design these roads to be winding and narrow (3.5 m in width) to discourage taxi drivers from speeding. Initially, beneficiaries designed roads with speed bumps but the taxi drivers found ways to remove them.

Also, in Kenya's highland region, labor may be more suitable for gravel road rehabilitation, because high population pressure forces farmers to till the soil up to the road's edge. Unlike



graders, which deposit material excavated from the drains on to farmers' land holdings, laborers deposit this material on to the road surface to build up the road profile. Activities for which labor-based methods cannot produce the same quality results as equipment-based include: underwater excavating, producing aggregates less than 15-20 mm in nominal size, piling, achieving certain surface tolerances, and compacting material.

2.5.7 Cost

Financial considerations are crucial in determining the feasibility of labor substitution. The financial feasibility of labor-based methods is a function of many factors, including: the availability of labor, the wage rate for unskilled labor, the supply of equipment and spare parts, the productivity of labor, and the nature of the works to be executed (including the type of works, its location, the way in which it is packaged, and way in which it is designed). This section discusses the first three of these factors.

2.5.7.1 The Wage Rate for Unskilled Labor

Wage rates have a decisive impact on the scope of labor substitution. A labor-based program in Mexico exemplifies this point. From 1971 to 1979, rural access roads were built using labor-based technology, with labor inputs averaging about 50 percent of total costs. From 1979 to 1982, however, the Mexican economy was buoyant and rural real incomes soared. Thus, labor participation in the rural roads program dropped steadily, reaching about 15 percent in 1982. Then, a financial crisis in 1982 reduced the real wage levels of agricultural labor. This factor, combined with the poor harvest in 1982, prompted the government to re-embark on labor-based construction, especially in the poorer areas of the country. (Chiang, W. C. 1988)

Even though the wage rate is only one of many factors determining the feasibility of labor-based methods, one can determine a loose estimate of the cut-off wage below which labor-based methods are feasible. In the mid-1970s, the World Bank and the ILO estimated the cut-off wage to be small per day in most labor-based operations.

Two decades later, in 1996, equipment and transport prices have more than doubled in recent terms for most developing countries, while labor wages have generally fallen in real terms. Thus, the ILO has increased the loose estimate of the cut-off wage to almost double rate from 5 years back.

2.5.7.2 The Supply of Equipment and Spare Parts

A large supply of used equipment and spare parts limits the scope of work for which labor-based methods will be cost-effective. This factor is often overlooked because in most Sub-Saharan African (SSA) countries, exchange rate reforms have made equipment imports relatively more expensive than labor. The exchange rate, however, is not the only factor determining the cost of



equipment. Cost is also determined by the abundance of equipment grants and the supply of used equipment already in the country. For force account units, frequent equipment grants enable road agencies to ignore the capitalization or recapitalization components of their operating costs, thus making equipment-based methods appear cheaper. For example, in Zimbabwe a Japanese grant for heavy machinery in the early 1980s encouraged the District Development Fund to use equipment-based methods to rehabilitate gravel roads as part of the Rural Road Program funded by the Federal Republic of Germany. Hughes, J. M. (2000)

In Morocco, the government's policies to promote employment in public works (including a duty of 30 percent on imported equipment) did not slow mechanization in road construction, because the investment budgets were almost exclusively financed out of foreign loans. In 1970, the World Bank granted Morocco a loan to purchase road construction equipment (bulldozers, graders, and loaders), on which no taxes were levied. Francis K. (2008)

2.5.7.3 The Type, Location, Packaging, and Design of Works

The comparative cost of labor-based versus equipment-based methods will depend in part on the type of work that is being executed, its location, how it is packaged, and its design. Theoretically, labor based methods are more cost-effective than equipment-based methods for those works that are small the smaller the work, the higher the equipment-mobilization cost as a share of total project cost. The comparative cost of labor-based methods also depends in part on the location of the work being executed. Von Braun (1998)

In general, the more scattered an activity or remote a project, the lower is the relative cost of labor-based versus equipment-based methods. For activities that are inherently small and scattered (such as spot improvement, culvert cleaning and scour-control construction), labor-based methods will tend to be more cost-effective. Francis K. (2008)

For projects that are small and remote (such as rehabilitating 10 km of gravel road far from any city), labor-based methods may also tend to be more cost effective. Another type of road works that often lends itself to labor-based methods is constructing or rehabilitating gravel roads that connect certain localities to existing secondary roads since these roads tend to be short, scattered and remote. In general, the smaller the work, the more scattered the activity, or the more remote the project, the lower is the relative cost of labor-based versus equipment-based methods. Lim,(1999)

2.5.8 Completion Time

Theoretically, one could deploy enough labor on a project to finish it in the same time that equipment based methods would require. Practically, however, when using labor-based methods, the completion time is constrained by the availability of labor and the size of the works. The availability of labor depends on the settlement patterns in the area where the works are being



executed and on the willingness of labor to work. In general, it is more desirable to recruit labor from local areas. Although laborers have been known to walk up to 20 km to the road sites, such exertion reduces their work efficiency.

The willingness of labor to work in civil construction depends on: earning differentials relative to alternative employment; the wealth of the individual (such as the extent of landholdings); any additional work-related costs of food, housing, and transport; the disutility of work in terms of leisure forgone; the method of payment (that is, check or food); and the regularity of payment. The regularity of payment depends on cash flow, which is critical for the survival and expansion of a labor based program. In the Dominican Republic, delays in paying workers spurred distrust and created difficulties in recruiting and retaining labor. World Bank. (1971)

2.6 Advantages of labor based contracting

All Procurement methods have different advantages over each other. The selection of a particular procurement route comes after the client must have critically look at its benefits and select it with the hope that it will satisfy his needs.

According to Ojo (2009), Direct labour system is simpler, cost-effective (the contractor's profit is eliminated) prudent, corruption free and provides jobs for the populace. Idoro (2007), agreed with this, he further said that the system has greater economy than the other contract systems used in Nigeria construction industry. He finally concluded that the achievement of the Nigerian construction programmes as greatly depends on this method. CACC (2005) identified three benefits of using direct labour system for project delivery and these benefits are highlighted below:

- Where absolutely essential for compelling reasons, helps to resolve special coordination, scope uncertainty, interface or other problems, and address special procurement needs, not able to be met otherwise.
- There are more certain quality outcomes where direct agency control is needed.
- The client/agency has more control of design and construction outcomes.

Al-hammad and Al-Quaibi (2005), discovered in their research on maintenance efficiency through direct labour that the system is of major advantages in providing full control of work, providing better cost control, providing more control on security risk, providing better control of quality, familiarity with the work.

Monigha (2011) was of the view that by using Direct Labour for project execution, there will be a reduction in project management costs, that the client will be fully involved in project controls, it will lead to elimination of profit due to the contractor on labour, material and plant,



administrative costs for bidding process will also be eliminated and lastly, the pre-execution phase will be drastically reduced in schedule.

With all said and done, It can not be concluded that Direct labour system is of advantageous to client and agencies seeking to have full supervision of project and work, cost effectiveness and economical approach to project delivery.

- ❖ If the client have ample understanding of engineering and construction, supply chain mechanisms, required technical, managerial and financial skills or if the client employ experienced project management consultants and followed strict site supervisions, detail schedule revisions and follow ups responsibly, It will give a room for upcoming contractors to be developed in to full-fledged contractors since these labor contractors will get a relief from risk associated to project execution and financial constraint.
- ❖ Flexibility in the use of labor can be achieved provided there are no effective regulations restricting the hiring and firing of labor contractors. The client can employ labor contractors when he has good financial stand and resources and released the contractor when no longer required or run out of cash and resources, flexibility can be combined with direct employment through the use of short-term or daily employment contracts.
- ❖ IF some training and skills transfer takes place and it can be assumed that a number of people employed as laborers may use this opportunity as a stepping stone to embark on a career in construction.
- ❖ Since purchasing and supply of construction materials and equipments takes the lion's share of the construction cost of a project, contractors with limited financial stand can bid for larger projects by employing competent project engineers, skilled crafts man and laborers.

2.7 The drawbacks of the labor-only contract

According to CACC (2005), in direct Labour project, the client carries all the work co-ordination interface risks and risk with possible work gang, hired plant or trade/small contractor inefficiency. There is also no tender price competition thereby making it difficult to ascertain the cost and time outcome/output and determine if the project is worth the value. The client is also faced with risks of design and management and exposed to greater extra cost risks.

Al-hammad and Al-Quaibi (2005) asserted that the disadvantages of Direct Labour includes, lack of skilled labour, More expensive and lastly, hard to recall people in emergency cases.

- ❖ The client become the main project coordinator which means the client is responsible for the work meeting Building Code requirements and for any defects in construction. Just



how much the client is responsible for the builder's work would depend on the facts in each case.

- ❖ The responsibility for coordinating the whole project, i.e. making sure everything happens when it should rests with the client. It will probably take a huge amount of the client's time and energy to hire contractors, buy materials and manage the project.
- ❖ The delivery of construction materials are on the schedule of the client not on the projects requirement hence it will create sever financial constraints on the contractor by inhibiting idle times, un utilized labor and machinery resources and potentials.
- ❖ There is no clear and defined sharing of Construction related risks and responsibilities which arise out of the construction lifecycle among project stakeholders in the labor based contracts.
- ❖ There are no clear and defined responsibilities of the client, consultant, and the contractor in case of building failures which are constructed under labor based contracts delivery system.
- ❖ There is no standard contractual provisions related to contractors power, duty and responsibility; price adjustment; termination; claim and dispute resolution for projects which under these method of project delivery system.

2.8 Labor based contracts and risk

The construction contracts can help in allocating risks to the different parties involved in the project. The owner has the power to decide the type of contract to be used for a specific project; hence it is very important that he understands the terms of the contractual agreement and also identify the risks associated with the different types of contracts.

Regardless of the type of contract selected by the owner, the contractor recognizes that the actual construction cost will never be identical to its own estimate because of imperfect information. The contractors' gross profit at a completion of a project is affected by the type of contract, the accuracy of its original estimate and the nature of work change orders. It is also common for the owner to place work change orders to modify the original scope of work for which the contractor will receive additional payments, the conditions of payment should be included in the contract documents to avoid disputes. The contractor should place appropriate contract prices at the time of bidding or negotiation depending on the condition of the market and the different risks involved in the type of contract .

Under the labor based contract method of delivery most owners want quality construction with cheaper cost but not all are willing to share risks or provide incentives to enhance the quality of construction. As a result there are only a few contractors responding to their invitation to submit bids or the bid prices submitted exceed their engineers estimate. And even if the initial bid prices



are close to the engineer's estimate, claims and disputes on the contracts become frequent. This claims and disputes can easily be avoided by improving the contract provisions and incorporating clauses that deal with management of risk.

2.9 Roles of client in labor based construction project

In addition to the owner reserves the right to accept alternatives in any order or combination and will determine the best Qualified Bidder on the basis of the following:

- A. Base Bid Price and the Alternates accepted.
- B. Proposed construction time.
- C. Reputation of the bidder.
- D. Experience of the bidder.
- E. Financial capabilities to perform the necessary work.
- F. Quality of the bidder's services.
- G. Bidder's past relationship with the clients in other projects.
- H. Other relevant criteria specifically listed in the request for bids.

Kadiri, (2003) , in his study on organizational structure for engineering projects was of the view that the roles of the client in a direct labor engineering projects includes:

1. The builders perform both their own design and some or all of the actual construction with their own forces.
2. In some cases they retain many of the management and conceptual design responsibilities, utilize consultants for some or all of the detailed design and depend upon construction contractors for hiring and supervision of the labor force. Illustration not visible in this except the unit price given in the bill of quantities shall cover all labor and partially materials, (machineries used for excavation and concrete works), formwork and the contractor's profit. The material and machineries supplied by the client and the contractor is listed in the table 2.1 below



Table .2.1 contract arrangement for a sample labor based contract under the study

Material and machinery supplied by the contractor	Material supplied by the client
Form work (inc Carpenter tie bar)	Cement
Concrete mixer	Reinforcement bar (with Bar Bender tie bar)
Mechanical concrete vibrator	Water
Carpenter and daily laborer tools	Concrete Admixture and Adhesives
Excavation and earth work machineries and equipment	All Electrical materials for electrical work
	All Floor Finishing material
	Gypsum
	Paint (inc paint brush)
	ceramic filler
	Hollow concrete block
	Wire mesh used for plastering
	Acid for ceramic and marble cleaning purpose
	Chip wood for expansion joints
	Sand, Aggregate, Pumice, Masonry stone,

2.10 CONCEPTS OF CONSTRUCTION PROCUREMENT SYSTEM

CACC (2005) defined procurement as the collection of activities performed by and for an agency to acquire services, products and other assets; beginning with the identification or detailing of requirements and concluding with the acceptance (and where applicable, disposal) of the products and other assets. Achuenu et al. (2006) described construction procurement as a method used by housing associations, property developers, private individuals, public and corporate clients to acquire new units of housing with reference to method of design, construction, parties to be involved in carryout these functions, and contractual arrangement. Rashid, Taib, Basiron, Nasid, Wan Ahmad and Zainordin (2006) mentioned that the procurement of construction



project is vast in scope and involves the gathering and organizing of myriads of separate individuals, firms and companies to design, manage and build construction products such as houses, office buildings, shopping complex, roads, and bridges.

Idoro (2011) described procurement method or systems as the chain of process in which a construction project is procured. He asserted that the process is interrelated and sequential and that the procurement processes have a considerable impact on the success or failure of a project.

McDermott (1999) acknowledged that there have been several debates over the right definition of procurement and after analysing those debate, he came to the conclusion that an accepted definition is that procurement is a strategy to satisfy a client's development and/or operational needs with respect to the provision of constructed facilities for a discrete life cycle. He further said that this sought to emphasise that the procurement strategy must cover all the processes in which the client has an interest, perhaps the whole lifespan of the building.

According to Love and Skitmore and Earl (1998), Building procurement has become a fashionable term with industry practitioners and researchers. It determines the overall framework and structure of responsibilities and authorities for participants within the building process. It is a key factor contributing to overall client satisfaction and project success. The selection of the most appropriate procurement method is consequently critical for both clients and project participants, and is becoming an important and contemporary issue with the building industry.

Hibberd and DjebarniinKadiri, (2003). Observed that the review of current practices in the UK shows different approaches to the procurement of building projects. They further stated that the classification of these approaches is extremely complex because there are not clear and universally accepted definitions of what a particular procurement method is and that this has raises a major issue.

Achuenu et al (2006) also mentioned that the building industry has various methods of procurement ranging from the very popular methods such as traditional, design and building, management contracts (construction management and management contracting), direct labour contracts, to the rare methods such as project management, package deal, turnkey, build-operate and transfer and partnering methods. All these methods have their various advantages over each other in the area of time completion, speed of construction, cost and quality among others.

In basic terms Procurement is the process used to obtain construction projects. It involves the selection of a contractual framework that clearly identifies the structure of responsibilities and authorities for participants within the building process. It is a key factor contributing to overall client satisfaction and project success. The selection of the most appropriate procurement method is consequently critical for both clients and project participants, and is becoming an important and contemporary issue with the building industry.



2.11 Ambiguity of labor based contract conditions about risk allocation.

Contract conditions represent the legal reference showing the relation between the contract parties. Risk associated with construction projects should clearly be allocated to the responsible party through the contract conditions. The absence of understanding of risk accountability between the parties will result in negligence of risk events which leads to parties assuming the risk event and its consequence may be out of their responsibility coverage.

When the contract conditions related to risk allocation are vague and not clearly defined several problems might be encountered. If any conflict is faced and the contract conditions does not address how to resolve the conflict then it may lead to endless disputes.

a. Undefined quality requirements

Quality is an important issue in building construction projects. The objective of any construction project is to finish the construction within the estimated budget, time and according to the quality requirements. Poor quality of work leads to loss of money and time. In labor based contract systems the owner has the right to ask for rework when the executed job is not complying with the agreed quality standards. But if the required quality standards are not clearly defined in the contract, the client might overstate the quality requirement which will create problems with the contractor.

b. Low percentage of the advance payment

The advance payment which is the payment provided by the owner to help out the contractor manage his obligations towards the contracts is very important to the developing contractor as it will provide a cash to start the project with. Typically on a labor based contracts construction project, since the materials are delivered by the client the remaining items of work for the contractor is placing of the provided materials and provisions of labor, this in turn cut of the initial cost of the project and hence will reduce the advance payment that will be provided for the contractor. In addition an advance payment will be provided by the client if the contractor requests it to meet significant startup costs incurred before construction begins. Usually the advance payment represents a percentage from the total amount of the contract, usually 15 to 20% depending on the nature of the work.



2.12 Summary of Literature review

The main objective of this research paper is to study the ever increasing acceptance and applications of labor based construction method of delivery in Ethiopian construction industry. Throughout the progress of this study, the researcher has the privilege of studying the practices of labor based construction project trends and practice of different countries and governmental and non-governmental organizations, as well as private and public sector , experiences .Through the literature review findings ,it has been studied in detail that the practices Labor based construction projects arise from developmental aids and food for work technical and financial aids in many parts of the developing countries .

Developmental projects that has been supported by donors and governmental agencies slowly develop in to a practice norm in small-scale construction projects carried out by small contractors. this method of construction delivery has gained a quick momentum in these developing countries construction markets, by introducing relatively lower startup costs to become a contractor and undertaking projects , as clients supply most construction materials while the contractors providing labor and hand tools .

Labor based construction projects has a unique feature of creating employment opportunities for relatively large group of individuals by direct labor hire and also can mobilize the mass through a short term technical trainings

There exist a big construction method of delivery gap in the construction industry, where clients are forced to pick labor based systems as an only alternative since the awareness for other types of construction methods of delivery systems

The impacts of labor based construction projects has been studied in detail from numerous projects in the past and this paper aims to shade a light on the ever increasing of construction projects in the Ethiopian construction industry.



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will present the methodological framework applied to solve the research problem and to answer the research questions. The chapter starts with the chosen research design, research approach and study area. Afterwards, the sample selection and the data collection methods will be presented.

3.2 Research Design

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with the time frame and scope of the project in procedure. In fact, the research design is the conceptual structure within which research has been conducted; it constitutes the blueprint for the collection, measurement and analysis of data (Kothari, 2004).

According to Robson (2002), the three purposes of conducting research are generally the following: explorative, descriptive and explanative. Explorative research is characterized as the seeking of new insights, the looking around, and the asking of questions or the bringing of some phenomenon into new light. Explanative research aims at gaining an explanation of a specific situation or problem, generally in the form of causal relationships. Finally, Descriptive research is a type of research that is mainly concerned with describing the nature or condition and the degree in detail of the present situation. Creswell (2003) stated that the descriptive method of research is used to gather information about the present or existing condition.

This study was focused on describing the current situation of the problem and answer the research questions which are in the form of “what”, and to highlight the most important factors that can negatively or positively affect the adoption of labor based construction system in to the Ethiopian construction industry

The research method selected for this study comprised of both qualitative and quantitative approaches. This will be shown in the development of the questionnaire that will be drafted based on the recommendation of the literature review and then refined and tuned through qualitative semi-structured interviews.

The questionnaires were developed based on the literature review to verify the actual selection methods used by public procurement procedure for contractors’ pre-qualification and bid



evaluation process. The second stage will be tested with experienced professionals in order to find out the shortcomings and the ambiguities in the first draft of the questionnaire.

Qualitative data was obtained through administration of questionnaires using 5 point likert scale to measure the labor productivity and the performance of other project variables. Descriptive and inferential statistical techniques were used for the analysis.

In the final stage, the modified questionnaires will be distributed among major sector authorities who are involved in the procurement of building construction projects whose annual project scopes are under the Addis Ababa City Integrated Infrastructure Development and Construction Permit & control authority. The expected sector participants are Construction developers, construction consultants, contractors and experts in the area research data. Moreover, adequate number of professionals with an average experience of 8 years in the construction industry including having experience in public building bid evaluation at least on two projects will be interviewed. Consequently, the responsive data will be statistically analyzed in pursuit of an answer to the research question.

Additional questions to account opinions and general background of the respondents to address the main questions, to be asked in this review are whether the points covered in the questionnaire are sufficient, clear and relevant to evaluate bid evaluation process in labor based construction projects.

From the feedback, some adjustments will be introduced to enhance clarity and to assure consistency in pursuit of appropriate results and conclusions.

Finally, the results will be presented and interpretation as well as discussion will follow on the research findings. Consequently conclusions will be drawn and recommendations will also be forwarded.

3.3 Population, Sample Size and Sampling Techniques

For the successful evaluation of this project paper and projects under investigation out of the one hundred four (104) questionnaires distributed, in the 10 sub cities of the Addis Ababa city administration randomly selecting 10 construction projects, since there exist more than 2560 construction permits from sub city and City administration construction permit issuing departments, sub city level construction permit and supervision departments is assumed and authorized by the government to issue permits and supervision projects developed in Addis Ababa city,

The permit plans from the sub cities ranges from G+1 to G+6 described as buildings where as from the medium to high rise buildings to the maximum height of the city administration



masterplan limit, goes to the, Addis Ababa City Integrated infrastructure Development and Construction Permit & control authority .Which has the power and the mandate to supervise the sub city level construction permit departments.

In research methods, population is the entire aggregation of items from which samples can be drawn (Yahiya, 2011).

$$N=n1/(1+n(1/n)) \dots\dots\dots[Eq ----3.1]$$

Where,

n = sample size

n1 = S2/v2

N = total estimated population

v = standard error of the sampling population. Total error = 0.1 at a confidence level of 95% and S2 = (P) + (1-P) = (0.5) x (0.5) = 0.25, where P is the proportion of population element that belong to a defined class.

Four sets of questionnaires I, II, III and IV were designed to collect information on the issues raised in the literature review and objective of study. Questionnaire A was designed solely Questionnaire to client side professionals, which help to ascertain whether the listed factors are recognized by client professionals. in the building industry while questionnaires II, III, IV were designed for labour-only subcontractors, clients and the stakeholders respectively. A total of one hundred four questionnaires were distributed to each of the four categories of the targeted respondents and this covers the Addis Ababa City Integrated infrastructure Development and Construction Permit & control authority .

Samples are chosen to represent the relevant attributes of the population. The researcher also notes the caution by Graziano and Raulin (1997) where the samples are not perfect representative of the population from which they are drawn, therefore the researcher unlikely to be able to generalize the conclusions to the entire population.

Currently there are more than 2000 projects waiting for approval for construction projects in Addis Ababa City Integrated infrastructure Development and Construction Permit & control authority looking alone the previous year’s permit approval of this office as presented in fig 3.1 below whereas the majority of the projects are approved in the sub cities which are assumed to be medium range and woreda levels as small scale construction projects , since the objective of this paper is to assess the scope of labor based construction projects for higher grade contractors in relatively large projects , the researcher has taken the secondary data base from Addis Ababa City Integrated infrastructure Development and Construction Permit & control authority, by



further analysis the raw data in to sub cities and random selection from them for questionnaire and interview survey

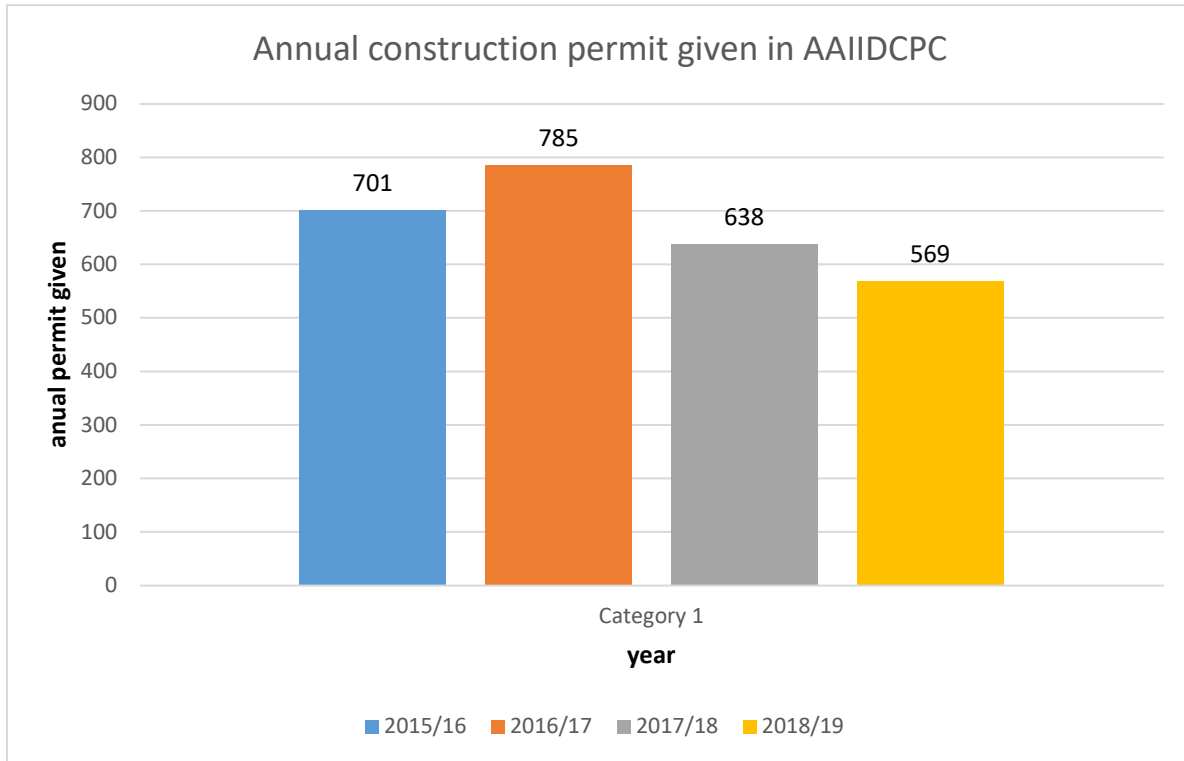


Fig 3.1 – Annual construction permit given in Addis Ababa .(Source AAIIDCPC 2019)

3.4 Sources of Data

The study was conducted by collecting data from both primary and secondary sources. The population of the main contracting firms and labour-only subcontracting firms used for this analysis are those listed in the register of the Addis Ababa City Integrated infrastructure Development and Construction Permit & control authority. Presently, Ministry of construction has different categories of registration which are based on their contract values machinery and man power requirements. Table 3.1 below further shows the contract values for each of these categories. Based on this, construction firms registered under different categories. were classified as main contracting firms This categorization was also arrived at from the preliminary study of on-going projects in the study area.

**Table 3.1:** grades for contractors, source Ethiopian Ministry of Urban Development and construction Aug, 2013)**Table :- 2 Grades for BC, RC and GC**

Categories	Grade	Construction Cost (Birr)		
		BC	RC	GC
(GC,BC,RC)	1	Above 210,000,000	Above 300,000,000	Above 350,000,000
(GC,BC,RC)	2	Up to 210,000,000	Up to 300,000,000	Up to 350,000,000
(GC,BC,RC)	3	Up to 160,000,000	Up to 225,000,000	Up to 270,000,000
(GC,BC,RC)	4	Up to 110,000,000	Up to 154,000,000	Up to 185,000,000
(GC,BC,RC)	5	Up to 54,000,000	Up to 76,000,000	Up to 100,000,000
(GC,BC,RC)	6	Up to 27,000,000	Up to 38,000,000	Up to 45,000,000
(GC,BC,RC)	7	Up to 11,000,000	Up to 15,000,000	Up to 18,000,000
(GC,BC,RC)	8	Up to 5,400,000	Up to 7,500,000	Up to 9,000,000
(GC,BC,RC)	9	Up to 3,000,000	Up to 4,200,000	Up to 5,000,000
(GC,BC,RC)	10	Up to 1,000,000	Up to 1,500,000	Up to 1,800,000

Secondary data: different documents, records and reports of the industry, Regulatory organ reports, from web site, books, annual reports and magazines, articles and journals were also analyzed.

The projects were selected based on random selection among private sector construction development projects, 18, 32, and 14 questionnaires were filled and returned by the labour based contractors, clients and the consultants respectively. The mean scores for each of the performance measures (time, cost, quality, frequency of accidents, technical and overall performance) were also computed by using the following formula (Adugna, 2003).

3.5 Analysis of respondents

Analysis and processing of research involves examining, categorizing, tabulating, testing or otherwise combining mixed evidences to address the initial problem statement. The analysis of the data depends on the specific research problem and objectives. The research instruments were designed properly to ease examining, categorizing and tabulating the research responses. The research questions are given weightings for the different responses of the questionnaire and it is presented in Table 3.2



Table 3.2 – Weight of different responses

Type of Instrument	Weight of the different responses			
	Very often / always / very important	Often / usually / important	Sometimes or somehow important	None / never / not important
Questionnaire	6	4	2	1

Responses for similar questions are aggregated by the following formula considering the above weightings (Borcherding and Jhon.D, 1999 cited in TewodrosAlemu, 2006).

$$MSV = \frac{6(Von)+4(On)+2(Stn)+1(Non)}{Von+On+Stn+Non} \dots\dots\dots[Eq\dots\dots 3.2]$$

Where; MSV = Mean Score Value;

Von = Number of respondents selecting very often or always or very important

On = Number of respondents selecting often or usually or important

Stn = Number of respondents selecting sometimes or somehow important

Non = Number of respondents selecting none or never or not important

The mean score of responses obtained by the above method are again classified based on the following criteria for interpretation:

Average score ranging:

- 0 ≤ MSV < 2; Poor performance
- 2 ≤ MSV < 4; Low performance (Unsatisfactory)
- 4 ≤ MSV < 5; Satisfactory performance
- 5 ≤ MSV ≤ 6; Good performance

where; MSV = Mean score value of the subtitle being analyzed in the discussion report and the numbers are score values.

The average score range description can differ according to the questions that are asked.

Score range description for the different questions were:

- 0 < MSV < 2; Not applied, very low consideration, very low performance, never, no problem or not affected



- $2 \leq MSV < 4$; slightly applied, unsatisfactory, low consideration, low performance, sometimes, low problem or less affected
- $4 \leq MSV < 5$; applied, considered, good performance, usually, problem or affected
- $5 \leq MSV \leq 6$; highly applied, highly considered, very good performance, always, high problem or highly affected

The descriptive and inferential statistical techniques were used for the analysis in this study. They include percentages, Kendall's coefficient of concordance, Chi-square test, and the correlation coefficient.

3.6 Data Collection Instruments

In order to collect sufficient data so as to answer the research questions, researcher designed two surveys; the first was a questionnaire to get quantified results. The second survey was interviews aimed to collect data from Construction developers, construction consultants, contractors and experts in the area research data. In addition to questionnaire and interview secondary data source has been also used.

3.6.1 Questionnaires

According to Yin (2003), structured questioners are important method for collecting primary data and that it further allows the researcher to be well focused on the specific research topic. The questionnaire was used because the researcher considered it to be more convenient as respondents could answer at their convenience (See Appendix 1). The questionnaire was developed by the researcher based on the research questions and the literature. The researcher used open and closed-ended type of questionnaires, which gives the respondents an opportunity for adequate expression of their view on the questions. The questionnaire began with an introductory statement, which specified the purpose of the research as purely academic. Respondents were encouraged being objective in their responses since they were assured of confidentiality.

To determine the probable usefulness of the questionnaire and whether further revision is needed prior to conducting the survey, the questionnaire organized and distributed. The researcher circulated the questionnaire to labor based construction project contractors and consultants, clients and client representatives for the projects under study. The subjects were asked if they had any problems understanding the questionnaire or have specific comments regarding the questionnaire. The format for responding was through both open-ended and close-ended questions. The subjects were encouraged to be very free with their responses, make suggestions for improvement and outline any difficulties they found. After each questionnaire was accomplished, every question was asked what he/she meant in checking various answers.



Comments were solicited on the intelligibility of the questions and what the changes should be done in order to make the questions simpler. These respondents also gave their comments on understanding the instructions about the scaling and the time taken to answer the questions. The test found no grave problems and minor modifications were made to the survey questions based on the response obtained. In addition, the pilot study was conducted to ensure the validity, sequence and relevance of the questionnaire to this study as despite in the above,

Questions present in the form of affirmative statements, relating to the concepts on the ever increasing adoption and impacts of labor based construction projects in Ethiopia, in such a way to enable measurement of the respondent's opinions. The respondents were asked to indicate their level of agreement on a five point likert scale with the following ratings. Strongly agree (SA; or 5), agree (A; or 4), neutral (N; or 3), disagree (DA; or 2), and strongly disagree (SD; or 1). The numbers were indicated in the questionnaires to provide a feel of ordinal scale measurement and to generate data suitable for quantitative analysis. The questionnaire was a close ended questionnaire to elicit guided responses and for easy analysis and to obtain additional information, the respondents were requested to provide open-ended responses if they have opinions which they feel the researcher would find useful.

3.7 Method of Data Analysis

In order to meet the stated research objectives, the collected data was analyzed based on the nature of the objective. Accordingly, the data collected via questionnaires was analyzed with descriptive statistics using statistical package for social scientists (SPSS) V. 20.0, Mycroft office professional add-ons were used. Furthermore, Wolcott (1994) cited in Creswell (2003; pp. 184), suggested that qualitative research is fundamentally interpretative i.e. the researcher makes an interpretation of the data. Thus, the data that was collected from the interview and reviews of documents were interpreted qualitatively. To sum, the analysis of quantitative data and interpretation of qualitative data combines to seek convergence among the results (Creswell, 2003).



CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

Data collected through different techniques were analyzed in this chapter. In the analysis, one hundred four (104) questionnaires were distributed to professionals', consultants, contractors' .out of the total number of questioners distributed sixty-eight were successfully completed, returned and used for the study. The response rate was approximately 68 % of the total questionnaires distributed. The researcher was also conducted interviews with each concerned Department Mangers of the construction permit office representatives of sampled sub city. Accordingly, the presentation, analysis and interpretation of the interviews and questionnaires were done simultaneously whereby the findings obtained from the interviews were presented in parallel by substantiating against the results obtained from the questionnaires. In order to analyze the research results, SPSS V. 20.0 tool software was used. Descriptive measures of each questions response and an interview conducted with results presented in the following sections.

4.2 Questionnaire survey response rate and respondent profile

The questionnaire was distributed to local contractors, consultants, real estate developers, government officials and professionals. Before analyzing the questionnaires, returned questionnaires were checked for their reliability and the valid responses shown in Table 4.1 were analyzed. Shows that the majority of the respondents are clients while consultants and client representatives are among the least respondents

In terms of previous hands on experience in the construction projects more than 40% of the respondents had had construction experience between five to ten years while 31%of the respondents have more than ten years of experience in the construction industry percent of respondents were site engineers,

Another important analysis regarding the project cost under study for this research work the lion's share of labour based projects under this study were found to be between ten and fifty million birr construction projects wile a significant portion of the total respondents' are running projects worth between fifty to one hundred million ETB as shown in Table 4.1 below

**Table 4.1** Questionnaire survey response rate and respondent profile

1	Respondents experience in the construction industry		
	Years	NO	Percentage
	<5 years	11	26%
	5 to 10 years	18	43%
	>10 years	13	31%
2	Respondents role on undergoing projects		
	title	NO	Percentage
	client	24	39%
	Contractor	18	30%
	Consultants	13	21%
	Others (client representatives ..)	6	10%
3	Estimated value of construction project in progress		
	Project cost	NO	Percentage
	<10 million	14	21%
	10 – 50million	33	49%
	50-100million	15	22%
	> 100million	6	9%

4.3 Construction materials delivery for the projects under study

Construction materials are the key component of any construction project. The quality, quantity, cost and delivery schedule of Construction materials is determined to be the mirrors of any construction project quality. Delivering construction material to projects is a huge burden and when not delivered by the right quality, quantity, cost and delivery schedule by proper professionals; the project is doomed to be a failure. Under this observation, each party asked clients questions about which construction materials are they delivering to the project site to assess the level of project material delivery.

When assessing the construction material purchase and delivery to the construction projects an esteemed 68 % of clients under this project supply ,major construction material for their project including cement reinforcement bar and aggregate necessary for the project , while 18% of the clients gives the responsibility of purchasing of concrete making materials such as cement sand and aggregate to the contractor and supply reinforcement bars for the project this according to them will give them the competitive advantage in cost by sharing major risks to the contractor when there exist a construction material cost escalation , while 12 % of the clients buy all the construction materials and laborer tools and hire sub specialized sub contractors to engage only in labor supply out of this projects as presented as Figure 4.1 below

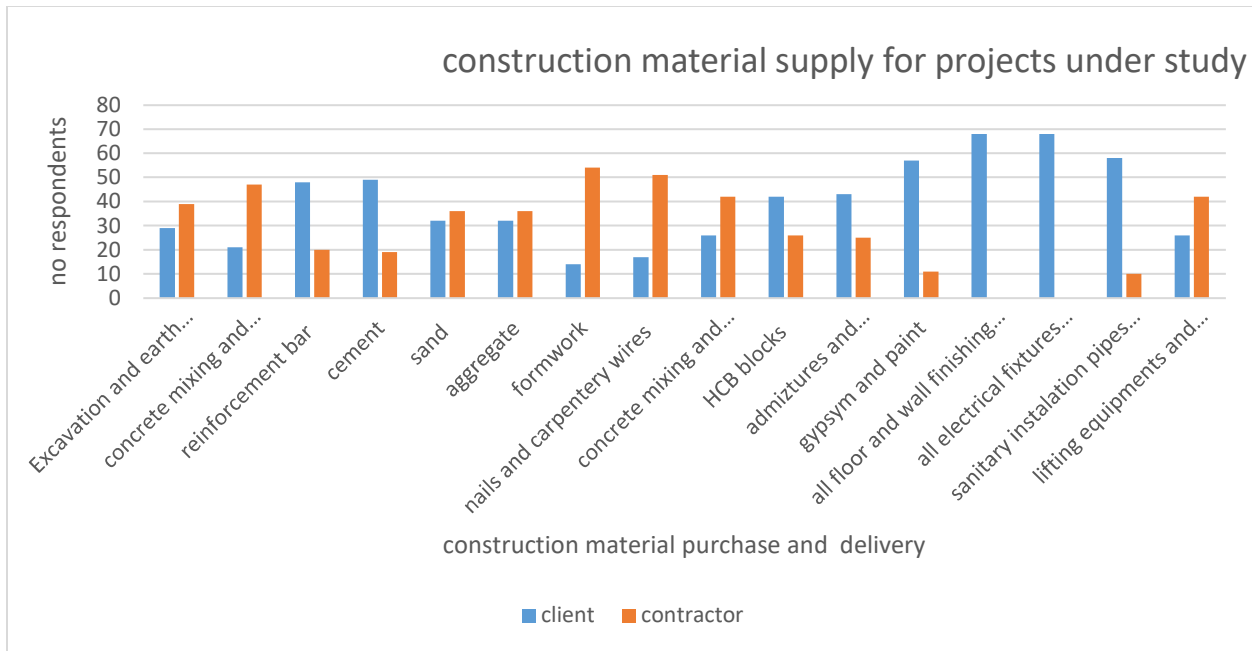


Fig 4.1: construction material purchase and delivery for the projects under study

4.4 Construction supervision and contract administration

Construction supervision and contract administrations is believed by many as one of the pillars of quality construction projects .Projects need to be as per the quality and safety requirements of local and international standards and regulations.

When investigating the issue of construction supervision and contract administration a staggering 34% of the projects under this study have no consultant on duty with random visits by professionals on pending issues , 28% of the projects have individual construction consultant with on need basis while only 14% of the projects have construction consulting companies on duty whereas 12% of the projects under this study were managed by professional employees hired by the client that has a duty to work as a resident engineer while the remaining 8 % of the projects are supervised by relatives ,friends as well as skilled partners .

Figure 4.2 further shows an alarming number of big construction projects are run without proper construction and contract administrations ,under the project development of this research , the researcher has observed projects that have more than 80 million birr project costs were run by this method of delivery without any consulting engineers or professional hired .

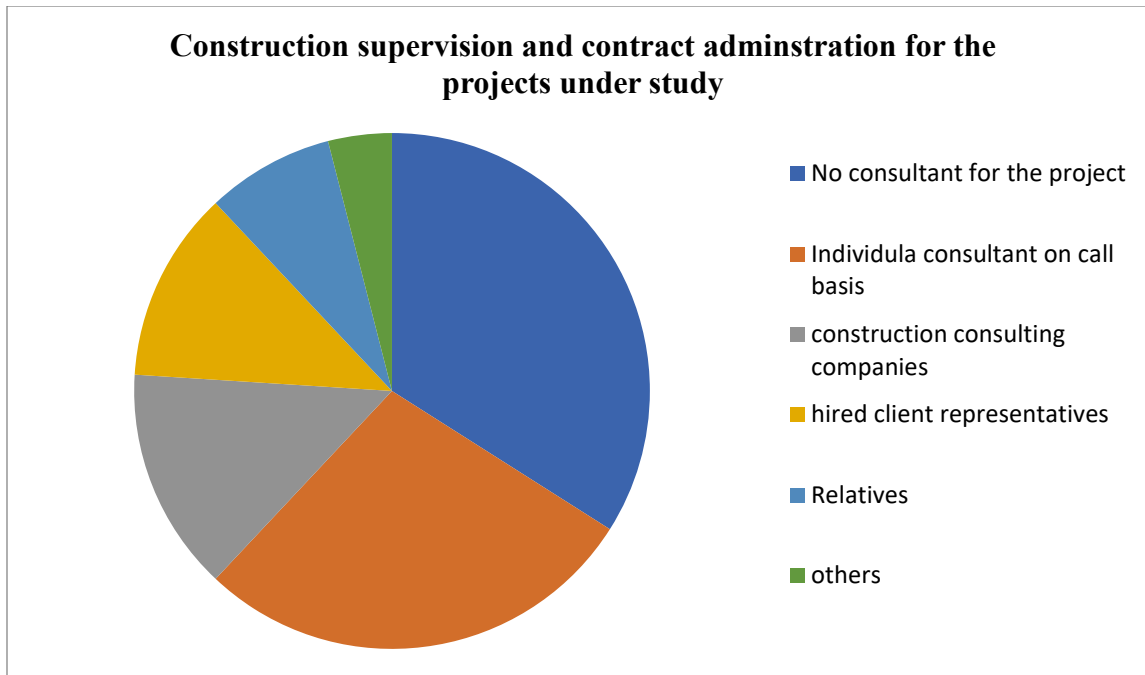


Fig 4.2: construction supervision and contract administration for the projects under study

4.5 Clients response on selecting labor base construction method of delivery

In order to know the most frequently used procedure for the selection of labor only contractors on construction sites, questions were asked from the respondent main contractors. The survey in detail presented in Table 4.2 below showed that the most frequently used procedure for selecting labour-only contractors on their project site is the fact that it gives the client in giving the upper hand in controlling the quality of construction materials. This is followed by Less project completion cost as the clients will have the advantage of having the contractors overhead and profit by supplying construction materials, followed by reputation of the contractor that draws the clients in adopting labor based construction and have confidence in selection of this method of delivery advance payments to construction projects contractors since the contractual amount will be significantly low (27%). The availability of creditors and trade relation of the client for the supply of construction materials and the clients over all control over the projects were among the lowest rank by clients response in adopting this method of delivery.



Table 4.2: Clients response in selecting labor based construction contracts.

Factors under evaluation		Degree of Impact on labour based selection					Standard deviation	average	variance	MSV	RANK
		5(SA)	4(A)	3(N)	2(DA)	(SDA)					
No	While selecting a contractor for your project										
1	Discretion in Selection and project administration	17	9	13	7	8	3.7	10.8	17.2	3.72	10
2	Less project completion cost with regard to labor with construction material contracts	39	15	0		0	15.9	13.5	339.0	5.44	2
3	Controlling quality of construction materials	42	11	1			17.5	18.0	457.0	5.52	1
4	Less contractual obligation to gain relief time when financial constraints for the project s	31	15	5	1	2	11.2	10.8	158.2	4.94	4
5	Gives better overall control to the client on the contractor and sub specialized contractors on the project.	19	28	4	3		10.5	13.5	147.0	4.39	7
6	Availability of creditors and trade relation of the client for the supply of construction materials	17	29	3	4		10.6	13.3	150.9	4.30	8
7	Reputation /recommendation of the contractor	40	12	2			16.1	18.0	388.0	5.41	3
8	To hire more than one sub specialized contractors to enhance quality of the project	8	19	24	2	1	9.2	10.8	105.7	3.28	11
9	less contractual risks	18	15	19	2		6.8	13.5	61.7	3.85	9
10	Easy to manage Stage by stage construction	37	15	21			9.3	24.3	129.3	4.44	6
11	Low advance payments to construction contractors	30	14	3	5	1	10.7	10.6	142.3	4.75	5

4.6 Labor based contractors response on suitability of labor based projects.

One of the first questions in relation to labor based projects is that why do contractors select this method of deliver to undertake construction projects In addition, fifty two of the respondents, representing. The contractors responding for this research, the projects awarded based on this method of delivery will help them to minimize risk with frequent price increments on construction materials,

The collected questionnaires presented in Table 4.3 below and as the respondents admit that and ranked labour based projects will be beneficial in giving low responsibility on material delivery and high concentration and focus on quality of works and labor ,among the high ranks the returned questioners to undertake large projects with relatively minimum capacity ,Twelve of the main contractors will be benefited from (75.0%) affirmed that preference is normally given to the capacity to work on different similar construction projects .Less project startup capital in



undertaking large projects with minimum capacity since labour is readily available in the market in addition to score relatively big projects under their name. Regardless of the type of procedures used in this selection, of the respondents, (12.0%) confirmed that this method of delivery help them with concentration and focus on quality of works and labor ,that the shared responsibility of quality assurance will increase the vote of confidence for their projects. Less startup cost and fast transition to higher grade contractor to attain better projects since materials (such as formwork tools and equipment's can be rented and purchased with advance payments .

Table 4.3: Contractor's response in selecting labor based construction contracts.

NO	Factors for selecting labour based projects for contractors						Standard				
		5(SA)	4(A)	3(N)	2(DA)	(SDA)	deviation	average	variance	MSV	RANK
1	Low bid preparation procedures and confidential award of contracts .	22	21	18	7		5.95818764	17	47.3333	3.81	6
2	Rapid acceptance of this method of delivery in construction projects .	19	13	22	8	6	6.1514226	13.6	47.3000	3.52	10
3	Less insurance and guarantee requirements for the projects	17	28	18	5		8.15475322	17	88.6667	3.75	8
4	less project start-up capital in undertaking large projects with minimum capacity	19	23	15	11		4.47213595	17	26.6667	3.63	9
5	Helps to undertake large projects with relatively minimum capacity	25	33	8	2		12.509996	17	208.6667	4.41	3
6	capacity to bid and work on different similar construction projects	21	30	9	8		9.08295106	17	110.0000	4.00	4
7	Low responsibility on material delivery and high concentration and focus on quality of works and labor	38	27	3			14.6135401	22.66667	320.3333	5.03	1
8	Less contractual commitment and risk	21	23	15	8	1	8.1877958	13.6	83.8000	3.82	5
9	Discretion in award of projects and project administration	19	25	14	8	3	7.78203058	13.8	75.7000	3.79	7
10	Low risk with frequent price increments on construction materials	38	23	6	1		14.6116392	17	284.6667	4.90	2

4.7 Achievement of Projects' objectives in labor based construction system.

The questionnaire also sought the opinions of the respondents on the achievement of projects' objectives on direct labor system ten factors were listed the respondents in each of the four categories were also asked to assess the performance of labor only contractors on their sites. This assessment was based on some identified measures of performance which are respect of time, cost, quality, technical and the overall performance. This was rated on a five-point scale (1-poor, 2 – satisfactory, 3-good, 4- very good, and 5- outstanding).



As shown in Table 4 .4 below. Out of the ten objectives stated, the cost saving by labour-based construction is ranked first followed by clients' satisfaction to manage and administer the projects easily and the fact that this method of delivery is well accepted in the construction builds confidence to the client, in adopting this construction method of delivery. While meeting original project cost budget and target quality expectations of the client ranked least. This result can be possible from the fact that in a developing construction industry like Ethiopia project developers have limited access of financial loans for the construction project, hence they prefer to be engaged in projects and contractors that can perform the tasks based on their completion budget . Once the owners purchase construction materials through personal budget and informal loans, the labor contractors' payments will not be a huge burden on the clients.

This suggests that this method might not be an ideal solution for every project and there are better options in construction method of delivery for specific projects. Contractors staff organization from head office to project site and their performance in completed tasks in average construction time were ranked average under this performance observation of clients and clients representatives.

**Table 4.4:** Achievement of projects objectives in direct labor system.

Performance under evaluation	how do you rate the contractors& project performance in this specific project 1 Low - 5 High										
	5(SA)	4(A)	3(N)	2(DA)	(SDA)	Standard deviation	avarage	variance	MSV	RANK	
NO											
Time performance (from bid to construction hand over)	6	7	9	5	7	1.32664992	6.8	2.2000	3.22	4	
2 contractors Overall performance from head office to project site labour and organization	2	13	7	5	7	3.6	6.8	16.2000	3.07	5	
3 Technical Performance of the contractor	4	6	11	7	6	2.31516738	6.8	6.7000	2.75	7	
4 Frequency of contractual disputes	3	11	9	5	6	2.85657137	6.8	10.2000	3.04	6	
5 meeting project Cost targets	2	5	7	16	4	4.87442304	6.8	29.7000	2.07	10	
6 meeting Quality Requirement of the client	2	4	8	11	9	3.31058907	6.8	13.7000	2.20	9	
7 Easy to manage and administer	14	8	5	7	0	4.53431362	6.8	25.7000	3.91	2	
8 Better cost saving alternative for the client	16	13	3	2	0	6.43117408	6.8	51.7000	4.59	1	
9 Less contractual liability	4	6	11	8	5	2.48193473	6.8	7.7000	2.69	8	
10 clients confidence in this method of delivery	10	8	7	6	3	2.31516738	6.8	6.7000	3.61	3	

Source: Field survey.

Taking a close look at Table 4.4 viz-a-viz other past studies, it is of note that “Meeting schedule completion cost ” which is the most achieved objectives here is one of the viewpoints of project success in Lim and Mohammed (1999) which is also one of the criteria suggested by Kometa et. al (1995); Pocock et. al (1996); and Kumaraswamy and Thorpe (1996). The issues of “Schedule completion” and “Satisfaction” were also raised by Songer and Molenaar(1997) and Wuellner (1990) respectively. This goes to confirm that direct labour system is a procurement method that can achieve some of the performance indicators highlighted by these researchers.

4.8 Summary of results and discussion

As a main observation to summarize the results discussed from this research paper the researcher finds out through analysis and summarizes the 68 % of clients under this project supply ,major construction material for their project including cement reinforcement bar and aggregate necessary for the project , while 18% of the clients gives the responsibility of purchasing of concrete making materials such as cement sand and aggregate to the contractor and supply reinforcement bars for the project. This according to them will give them the competitive advantage in cost by sharing major risks to the contractor when there exist a construction material price escalation.



In addition 12 % of the clients buy all the construction materials and laborer tools and hire sub specialized sub contractors to engage only in labor supply out of this projects .Further the most frequently used procedure for selecting labor-only contractors on their project site is the fact that it gives the client the upper hand in controlling the quality of construction . Followed by Less project completion cost as the clients will have the advantage of having the contractors overhead and profit by supplying construction materials ,as reputation of the contractor that draws the clients in adopting labor based construction and have confidence in selection of this method of delivery.

When studying the implementation of advance payments to construction projects contractors since the contractual amount will be significantly low .The availability of creditors and trade relation of the client for the supply of construction materials and the clients over all control over the projects were among the lowest rank by clients response in adopting this method of delivery. The contractors responding for this research ,the projects awarded based on this method of delivery will help them to minimize risk with frequent price increments on construction materials, giving low responsibility on material delivery and high concentration and focus on quality of works and undertake large projects with relatively minimum capacity ,contractors will be benefited from affirmed that preference is normally given to the capacity to work on different similar construction projects .

In addition contractors tend to enjoy this method of construction delivery due to its less project startup capital in undertaking large projects with minimum capacity since labor is readily available in the market in addition to score relatively big projects under their name in addition to the shared responsibility of quality assurance will increase the vote of confidence for their projects. Less startup cost and fast transition to higher grade contractor to attain better projects since materials (such as formwork tools and equipment's can be rented and purchased with advance payments .



CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

This section forwards the conclusions of this research based on the major findings stated in the previous chapter, data analysis and discussion, a brief conclusion are summarized to the findings and finally helpful recommendation for the research problems will also be forwarded. .

Many researches and research findings suggest the use of the labor-only procurement system might be suitable for small, privately owned projects such as residential building and minor alteration or modification works. This is a major limitation for this system among other issues such as the need for time commitment on the part of the client, reduction in contractor's profit and its usage by only small contractors.

In addressing the project delivery pillars of time quality and cost these factors can only be captured if an economic rather than a financial cost comparison is carried out. In the situation prevailing in many project undertakings immediate economic cost comparison will favor labor-based methods more than equipment-based methods.

Thus, if labor-based methods are cheaper than equipment-based methods in financial terms, the cost advantage will be even greater in economic terms. If labor based methods can be shown to be financially cheaper, then there is a greater chance of adoption and sustainability of these methods in the private sector.

After summarizing survey data's and analysis outputs for these study the researcher further recommends the following core results as an output ,the results hence are :

- I. The majority of these clients under the study believe that employing labour only contractors will accelerate the activities of the construction project, since there is a minimum responsibility for the supply and delivery of construction material.
- II. Clients tend to believe that having the responsibility for delivering all the construction materials necessary for the project, will gain them the profit margins and overhead of the contractor.
- III. Clients who own other businesses will enjoy a competitive tax deduction for purchase under the companies' license ,



- IV. Clients feel that it is better to supply construction material for the project will guarantee them the satisfaction of quality approval of the construction materials, this according to them will minimize on the doubt about the quality of their project.
- V. Contractors under this study reveal that the limitations on their financial capacity, doing labor based projects will give them the competitive financial incentives in addition to score relatively big projects under their name.
- VI. Contractors believe that the major headache of construction projects is supplying construction materials on time with the right quality and quantity; this will help the contractors by assuring less responsibility of quality assurance.
- VII. Contractors agree with the idea of having less contractual risks, and the capacity to work on different similar construction projects since the availability of labour for the works.



5.2 RECOMMENDATIONS

Based on the findings of the research, the following suggestions and recommendations are made.

- I. The study, therefore, recommends that the use of the labour-only procurement system should be encouraged among construction participants trying to achieve small construction projects within the available budget. However, care must be taken not to adopt this procurement option for high capital and very technical projects. Since Controlling quality of construction materials and risk associated with the construction projects is very hard to manage while adopting this method of delivery to large projects
- II. The economic and life cycle project Cost Comparison should be studied in depth and detail regarding Labour-Based and Equipment-Based Methods for construction projects
- III. Relevant authorities and regulatory bodies should set a proper legal guidelines in terms of construction method of delivery
- IV. Academic institutions and professional association should address the ever increasing spread of labour based construction project and push for guidelines and professional competency assessment on the method of delivery.
- V. The wide acceptance of projects with labor based method of delivery is increasing in terms of project cost, project quality and project administration. Hence, risks and responsibilities of each party in the construction project have to be clearly specified in construction contracts and agreements.



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Appendix 1 Questionnaire



ADDIS ABABA UNIVERSITY

ADDIS ABABA INSTITUTE OF TECHNOLOGY

SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING

Questionnaire

on

Study On Labor Based Contracts In Ethiopian Construction Industry;
The Case Of BC3 And Above Selected Building Contractors Around Addis Ababa

**Degree of Master of Science in Civil Engineering
(Construction Technology and Management)**

BY: YohannesKassa

March 2019



Dear Respondents,

As part of my M.Sc. study in Construction Technology and Management at Addis Ababa University, I am undertaking a research on the title “Study on labor based contracts in Ethiopian construction industry; the case of BC3& above building contractors around Addis Ababa”.

The main objectives of the study are:

- To analyze Performances, challenges and prospects of labor based contract system in Addis Ababa
- To assess how labor based contractors actually take account of risks in the life cycle of the construction project.
- To analyze the issues of health and safety and contractual obligations of the client the contractor and the consultant (if there is any)
- To assess contractual provisions related to contractors power, duty and responsibility; price adjustment; termination; claim substantiation and dispute settlement procedures; regarding labor based building contracts in Addis Ababa town.

I have developed this questionnaire to collect views of professionals working for employer, contractors and consultants for completeness of my research. It is my belief that the research, in addition to its academic significance, will have a practical significance for the development of building construction sector in Ethiopia and initiates further research on the topic.

Your response, in this regard, is highly valuable and contributory to the outcome of the research. All feedback will be kept strictly confidential, and utilized for this academic research only.

Kindest Regards,

YohannesKassa

Post Graduate Student, Construction Technology and Management

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Section I. General background
Questionnaire to respondents', which help to see experience and exposure of the respondent that makes the research data confidential or qualifying to analyse further.

1.1. Name of organization: _____

1.2. Type of organization:

Employer Contractor Consultant
Other (Please specify) _____

1.3. Your general work experience on construction industry or specific project

< 5 years 5 – 10 years > 10 years

1.4. Previous construction in completed or undergoing projects?

<2projects 2 – 5projects > 5projects

1.5. Previous construction in completed or undergoing projects?

<10 million 10 – 50million 50-100million >100million

1.6. Your Name, Title and Contact address:

Name (optional): _____

Job Title: _____

Contact address (optional): _____

E-mail: _____

Tel: _____



Section II.
Questionnaire to clients and client side professionals, which help to ascertain whether the listed factors are recognized by client professionals.

1. Do you think labor based construction method has a competitive cost advantage over other method of delivery such as labor with material construction contracts

Yes No

2. Do you think labor based construction method gives a better hand in representing the clients interest in terms of project quality time and cost .

Yes No

3. projects cost advantage over other method of delivery such as labor with material construction contracts

4. Do you prepare proper selection criteria for contractor selection plan?

Yes No

5. Do you have understanding of the construction method of delivery systems?

Yes No

6. Does project packaging section of your procurement plan incorporates

6.1. legal requirements of the contractor	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
6.2. Resource required	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
6.3. Specific criteria	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>

7. When choosing a contractor for your project how did you decide project delivery method

7.1. By advising construction consultant	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
7.2. Consultation with Relatives ,friends ,family	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
7.3. Prior experience with the contractor	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
7.4. Personal observation, experience	Yes	<input type="checkbox"/>		<input type="checkbox"/>
7.5. Others				<input type="checkbox"/>



8. If you choose others, please write the reason.

9. Time given for the bid evaluation process mostly is

Excess fficient rt

10. is there a consultant or certified advisor for the construction project ?

Yes No

11. if you answer no for question no 8 how do you hire consultant or certified advisor for your project (thick only one)

- 11.1. resident consultant or consulting company
- 11.2. independent advisor on call basis
- 11.3. Provided by contractor
- 11.4. relatives advising projects
- 11.5. Others

12. How do you calculate or what do you assume to fix project construction period

- 12.1. previous back ground
 - 12.2. provided by the contractor
 - 12.3. Provided by consultant
 - 12.4. Fixed Budget
- Or (forced project completion or termination)

13. If it is provided by the consultant, by what mechanism do you check its appropriateness?

- a. Scientific ground
- b. Simply accept time provided by consultant
- c. Other means

14. Please specify if there are other means if there are any .



Section III.

Questionnaire to client and client side professionals, which help to assesses degree of material delivery for the construction project .

material and machinery supplied for the project	Material supplier (please thick one)		
	Client	contractor	Remarks
Cement			
Reinforcement bar (with Bar Bender tie bar)			
Sand, Aggregate, Pumice, Masonry stone,			
Form work (inc Carpenter tie bar)			
Concrete mixer			
Mechanical concrete vibrator			
Carpenter and daily laborer tools			
Excavation and earth work machineries and equipment			
All Electrical materials for electrical work			
All Floor Finishing material			
Gypsum			
Paint (inc paint brush)			
ceramic filler			
Hollow concrete block			
Wire mesh used for plastering			
Acid for ceramic and marble cleaning purpose			
Chip wood for expansion joints			
All Electrical materials for electrical work			



Section IV.
Questionnaire to client and client side professionals, which help to assesses degree of impact and frequency of occurrence the listed factors on contractor selection criteria you have used for your project.

S/ No	Factors under evaluation While selecting a contractor for your project	Degree of Impact on contractor selection					Please rank the following facets of that you feel we need to focus on improving most (1 High - 10 Low):									
		Very High	High	Moderate	Low	None	1	2	3	4	5	6	7	8	9	10
1	Discretion in Selection and project administration															
2	Less project completion cost with regard to labor with construction material contracts															
3	Controlling quality of construction materials															
4	Less contractual obligation to gain relief time when financial constraints for the project s															
5	Gives better overall control to the client on the contractor and sub specialized contractors on the project.															
6	Availability of creditors and trade relation of the client for the supply of construction materials															
7	Reputation /recommendation of the contractor															
8	To hire more than one sub specialized contractors to enhance quality of the project															
9	less contractual risks															
10	Easy to manage Stage by stage construction															
11	Low advance payments to construction contractors															



Section V.
Questionnaire to clients, consultants and professionals, which help to ascertain whether the listed performance factors by the project stake holders .

1. On which qualification criterion of the technical evaluation taken as decision influential points in selecting labour based contractual system for your project ,Please rank the following facets of

S/ No	Factors under evaluation	Degree of Impact on contractor selection					Please rank the following facets of that you feel we need to focus on improving most (1 High - 10 Low):									
		Very High	High	Moderate	Low	None	1	2	3	4	5	6	7	8	9	10
1	Low bid preparation procedures and confidential award of contracts .															
2	Rapid acceptance of this method of delivery in construction projects .															
3	Less insurance and guarantee requirements for the projects															
4	less project start-up capital in undertaking large projects with minimum capacity															
5	Helps to undertake large projects with relatively minimum capacity															
6	capacity to bid and work on different similar construction projects															
7	Low responsibility on material delivery and high concentration and focus on quality of works and labor															
8	Less contractual commitment and risk															
9	Discretion in award of projects and project administration															
10	Low risk with frequent price increments on construction materials															

your employment package in terms of importance to you (1 Low – 5 very High):



S/ No	Performance under evaluation	1 Low - 6 High						
		None	1	2	3	4	5	6
1	Time performance (from bid to construction hand over)							
2	Overall performance							
3	Technical Performance							
4	Frequency of contractual disputes							
5	High Cost performance							
6	Quality performance							
7	Easy to manage and administer							
8	Better cost saving alternative for the client							
9	Less contractual liability							
10	The fact that it has becoming common in the construction industry ,(relatives ,friend and families are using this method of delivery							