JIMMA UNIVERSITY

JIMMA INSTITUTE OF TECHNOLOGY

SCHOOL OF GRADUATE STUDIES

FACULTY OF CIVIL AND ENVIRONMENTAL ENGINEERING

CONSTRUCTION ENGINEERING AND MANAGEMENT CHAIR

STUDY ON FACTORS AFFECTING EFFECTIVENESS OF HUMAN RESOURCE PLANNING AND MANAGEMENT SYSTEM IN PUBLIC BUILDING CONSTRUCTION PROJECTS IN ADAMA TOWN

A Thesis Submitted to the School of Graduate Studies, Jimma University, Jimma Institute of Technology, Faculty of Civil and Environmental Engineering in Partial Fulfillment of the Requirements for the Degree of Master of Science in Construction Engineering and Management

By

Abdissa Garadew

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Advisor: - Getachew Kebede (PhD.)   -----------------------------------

                Name   Signature

Co-Advisor:- Engr. Mebratu Abera (MSc)   -----------------------------------

                Name   Signature

DECLARATION

I declare that this research untitled "study on factor affecting effectiveness of human resource planning and management systems in public building projects in Adama town" is my own original work, and has not been summited as a requirement for the award of any degree in Jimma university or elsewhere.

Abdissa Garadew Gudissa   --------------------------   -------------------------

       Name   Signature   Date

As research Advisor, I hereby certify that I have read and evaluated this paper thesis prepared under my guidance, by Abdissa Garadew Gudissa entitled "study on factor affecting effectiveness of human resource planning and management systems in public building project in Adama Town" and recommended and would be accepted as fulfilling requirement for the degree MSc in Construction Engineering and Management.

Getachew Kebede (PhD.)   ---------------------------------   -------------------------

     Main Advisor   Signature   Date

Engr. Mebratu Abera (MSc)   --------------------------------   -------------------------

     Co Advisor   Signature   Date

ABSTRACT

Construction industry is a major player in economy of any countries by generating employment and wealth to the nations through its forward and backward linkages with other sectors. However many projects in developing countries experienced extremely high cost overrun, time slippage and low quality.

There are so many different factors that result in such a problems in building construction project but human resource planning and management (HRPM) systems are one of the most problems overall the performance of any construction projects. Since project effectiveness in developing country like Ethiopia is highly dependent on HRPM systems. The objective of this study is to identify the factors affecting effectiveness of HRPM systems, analyze and rank the most significant factors and significant of impacts of these factors affecting effectiveness of HRPM systems in public building construction projects in Adama town.

To achieve this objectives data collection was carried out through the review of literatures and informal discussion with colleagues and professionals in the sector. Based on the literature review and informal discussion the study was identified 52 possible factors affecting effectiveness of HRPM systems was used for this study. After those factors were identified a questionnaire was designed by categorizing each factor under seven groups namely 14 factors under management related factors, 5 under Sub-Contractors related factors, 10 under Labor related factors, 7 under worker motivation related factors, 5 under Machinery Related Factors, 5 under Material Related Factors and 6 External related factors. Then the totals of 33 questionnaires were distributed to 22 public building projects in Adama town. From a total of 33 questionnaires 30 of them were responded correctly. Among 30 respondents 19 of them were from contractor side and 11 of them were from consultant side and data was obtained were analyzed by using RII and SPSS.

To accomplish the public building project without problems, the stakeholders especially for contractors and consultants who widely involve HRPM systems should be fulfilling construction resources with using the qualified employees and properly manage with daily supervise in all their activities to enable the project's successfully completed.

Key: *effectiveness, human resource planning, management, public building projects.*

AKNOWLEDGMENT

First would like to thank my Almighty God for making this work conceivable. I am incredibly pleased to extend my gratitude to my thesis advisor **Getachew Kebede (PhD)** for his critical and professional comment, constructive criticism, suggestion and useful advice that have improved the quality of my work and also helped my career at large and my co-advisor **Engr**. **Mebratu Abera (MSc)** for all his advice, motivation, kind support and guidance during the course of writing this thesis.

Next, I extend my sincere thankfulness to all individuals those directly or indirectly helped me to realize this thesis, especially my respondents' (contractors and consultants) in the Adama town for their kindness and expert treatment in responding my questionnaires, interviews and case study. Besides, I also like to say thank you for the staff members of construction engineering and management department and my classmates at Jimma University.

Finally, I would like to express my gratitude to my family especially my wife Lomitu Merera and my child Firi Abdissa for their enormous patience, encouragement, and support they gave me during the whole period of my study

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GDP	Gross Domestic Product
MoUDC	Ministry of Urban Development and Construction
EEA	Ethiopian Economic Association
PMI	Project Management Institution
ECoT EMPA	Ethiopian Construction Technology and Management Professional Association
PMBOK	Project Management Body of Knowledge
HRM	Human Resource Management
HR	Human Resource
PM	Project Management
HRP	Human Resource Planning
WBS	Work Breakdown Schedule
HCB	Hollow Concrete Block
HRPM	Human Resource Planning and Management
EHRPM	Effectiveness of Human Resource Planning and Management
SPSS	Statistical Package for Social Science

1. INTRODUCTION

1.1. Background of the study

Construction industry in the creative activity involved in transforming physical resources into a structured regarded as being usefully. It is an inherently satisfying activity because people gain satisfaction from the productive application of their skills and efforts. In other words, the success of an organization depends on the ability and expertise of those who operate it both at the management and lower levels of operation.

Human resource planning plays an important role in human resource management because it translates the objectives of the organization into a number of workers needed by determining the human resource required by the organization to achieve its strategic goals. Further, Abhishek, (2017) noted that, construction project performance was determined by on-time completion of the project, completion within budgeted cost and conformity with specifications and stakeholders' satisfaction. Oluseyi Julius, (2014) cited that, inexperienced (contractors and sub-contractors), lack of supervision, lack of worker motivation, lack communication, poor transportation of construction materials as leading to wastage of transported materials and causing construction delays and an attendant increased cost of construction production. The effectiveness of human resource planning significantly depends on the right application of construction tools and equipment. Inadequate use of equipment may lead to damage of construction equipment (due to operative lack of agreement with the management policy or unsatisfied earnings) or as a result of lack of technical know-how (Brandenburg, 2006).

The nature and formation of construction projects presents the sector with diverse challenges. One of the most significant of these challenges was the low effectiveness of human resource planning and management (El-Dash, 2015). Management of human resource was extensively defined as a logical approach to the management of an organization's expensive asset (employees), who individually and as a group work together towards achieving the set goals of an organization. Significantly, human resource planning are essential to the construction sector, just as construction activities are significant to the economies of nations (Janes, 2017).

In developing countries, a common lack of planning human resource experience exists in construction management implementation. Management knowledge and skills are gained through practice, training, development and interacting with other experienced individuals and entities. According to simon (2018), improvement on human resource planning was critical to overall productivity and cost effectiveness in the construction industry. A synonym for success, according to Kumar (2018), states the effectiveness was the degree of achievement of objectives. Projects were formed to accomplish objectives and success was measured in terms of how well these objectives have been met. Criteria such as meeting project time, budget, technical specification and mission to be performed were the top priorities of project objectives.

1.2.   Statement of Problems

Human resource management in construction industry is a very complex management because incorporates deferent project management team and it needs a continuous follow up overall management teams. Human resource planning and management consists of primarily the total of activities that follow from an assignment to management works.

Previous research shows that, from various in our country the effectiveness of human resource planning and management systems in public building projects can be affected by numerous factors that expose it to adverse effects. The different factors adversely affect the effectiveness of HRPM in public building construction in Adama town are due to the management related factors, performance of sub-contractor related factors, labor related factors, motivation related factors, construction material related factors, equipment related factors, and external factors are the major factors affecting the effectiveness of HRPM in public building projects and the problems are encountered in the construction sector by the lack of effective management of Contractors and Consultants.

Therefore, the purpose of this study was to assess the factors that affect the effectiveness of HRPM systems in public building construction projects in Adama Town in order to assist consultants, and contractors to overcome the effectiveness of HRPM problems and to determine the impacts of EHRPM factors on public building construction projects.

1.3. Research Questions

The following questions will be addressed that can be answered at the end of the study.

1. What are the factors that affect the effectiveness of human resource planning and management systems in public building project in Adama town?

2. What are the most significant factors affecting effectiveness of human resource plans and management systems in public building project in Adama town?

3. What are the impacts of effectiveness of HRPM factors in public building project in Adama town?

1.4. Objective of the Study

1.4.1. General objective

The research objective is assessing the factors affecting effectiveness of human resource planning and management systems in public building project in Adama Town.

1.4.2. Specific objectives

1. To identify the factor affecting effectiveness of human resource plans and management systems in public building project in Adama Town.

2. To determine the most significant factors affecting effectiveness of human resource planning and management systems in public building project in Adama Town.

3. To determine the impacts of effectiveness of HRPM factors in public building project in Adama town.

1.5. Scope of the Study

The scope of this research study was limited to only public building construction projects in Adama town. The information was gathered from the following stakeholders in both construction and consultancy firms; contractors, site managers, supervisors, project managers and engineers.

1.6. Significance of the Study

According to Gurudev, (2017) the human resource of an organization represents the largest investment of an organization. Inadequate utilization of human resource in the construction industry does not only constitute waste to construction organizations, but also to individual clients, governmental organizations, construction workforce and ultimately affects the construction industry's project delivery record.

The main significance of this study is to provide essential information about factors affecting effectiveness of HRPM systems to the project stakeholders especially for contractors and consultants who widely involve HRPM systems in all their activities to enable the project's successfully completed. In addition, effectiveness is attained through effective utilization of all construction resources to achieve the set of organizational objectives (Oluseyi Julius, 2014). The basic objectives of construction organizations are: on time project delivery, project delivery within budgeted cost and delivery at quality expected. These factors constitute the benchmark for construction success and are significantly dependent on the adequate human resource planning and management systems. Hence, since both adequate utilization of construction resources and project performance are subject to the effectiveness of human resource planning and management systems. Therefore the main significant this study was:

It addresses the major responsibilities of public building construction stakeholders.

It will contribute to understanding the factors that affecting the effectiveness of human resource planning and management systems.

It increases awareness of project team on remedial measures to the problems that are encountered in the construction sector in terms of effectiveness of human resource planning and management systems

2. LITRATURE REVIEW

2.1. Construction Industry

Having introduced the broad categories of construction project types, we shall now consider further aspects of the industry by way of some representative statistical data. We want to look at the role that construction plays in the overall economy, the relative proportions of the various construction categories and the character of the industry in terms of the sizes of companies that carry out construction work. Construction is big business. The industry's significant impact on the world economy can be demonstrated by reviewing construction's proportion of the total value of goods and services, as well as the number of people employed in construction as a proportion of the total workforce and the number of construction firms compared with the total businesses in all industries.

According to MoUDC (2012) construction industry was a sector of the economy that transforms various resources into constructed physical economic and social infrastructure necessary for socio-economic development. It embraces the process by which the said physical infrastructure were planned, designed, procured, constructed or produced, altered, repaired, and demolished.

MoUDC (2012) classify construction industry as:

Building such as residential building in urban and rural areas, non-residential building, i.e. factory buildings, ware houses, office buildings, garages, hotels, schools, hospitals, clinics, etc.

Transportation systems and facilities which are airports, harbors, highways, subways, bridges, railroads, transit systems, pipelines, and transmission and power lines.

Structures for fluid containment, control and distribution such as water treatment and distribution, sewage collection and treatment distribution systems, sedimentation lagoons, dams, and irrigation and canal systems, underground structures (such as tunnels and mines).

In Ethiopia construction industry comprises of organizations and persons who include companies, firms and individuals working as Client, Consultant, Main Contractors and Sub-Contractors, materials and component producers, plant and equipment

suppliers. The government was involved in the industry as client, financier, regulator and operator.

According to MoUDC (2012) construction industry in recent year has under gone dynamic changes due to improved technologies, increased competition, customer expectations and demands and scarcer economic resources. Therefore to overcome problems coming from these dynamic changes the industry needs improved, competent and effective managerial skills.

2.1.1. The role of three parties in Construction industry

The development and then execution of a project is both a mission and an adventure. A project, in its broadest sense, is any task which has to be accomplished within a scheduled time and within a defined budget. This implies that every project has its stated objectives and there are always three that are basic: the completed facility, complying with the appropriate specifications, the budgeted or target cost and the time required to completion.

Three lead 'players' can be involved in all such projects, each having their specific role if the objectives outlined above are to be achieved. These are: (a) owner (b) consultant and (c) contractor. Their specific functions can well vary from case to case. No two projects are ever the same, even when they may appear to be. Each and every project is unique and so, therefore, are the roles played in each project by our respective players. Once the owner has decided to proceed with a project he always has to first establish feasibility, then initiate design and construction, and finally commission and operate.

When he begins he has a variety of choices open to him, his choice being determined to some extent by his own capability - or, more often, his own judgment as to his capability, which may well be at fault. He can do it all himself or seek the services of a consultant or seek the services of a contractor.

2.1.2. The lines of demarcation

In the concept of project management that we are now developing, the three key participants that we have just introduced have three distinct and separate roles to play, thus:

> ➢ The owner - oversees and pays

> ➢ The consultant - advises

> ➢ The contractor - does the job

The boundary between consultant and contractor is somewhat blurred these days and there are many - too many – contractors who feel that they are quite competent to play 'consultant' and so combine items consultant and contractor above, but we do not agree. For the moment, let us assume that the owner takes the course of employing a consultant and see where that concept takes us in terms of project management. The other significant aspect is that the consultant should be brought in at the very earliest stage. All too often he is brought in after the owner has gone some way along the road. This has the inevitable result that certain aspects of the project become 'fixed', to the later detriment of profitability, but it will be the consultant, not the owner, who finally has to carry the blame. Few realize the powerful influence that the earliest of the actions taken with respect to a project, in what is called the pre-design, or feasibility study stage, can have upon the ultimate cost and profitability of a project.

2.2. Construction Project Management

PMI (2013) Define project as a temporary endeavor under taken to create a unique product, service, or result. The temporary nature of project indicates a definite beginning and end. According to PMI (2013) the end of project was reached when the project's objectives have been achieved or when the project was terminated because its objectives will not or cannot be met, or when the need for the project no longer exists. Project management institute lists some examples of projects as follow:

> ➢ Developing a new product or service

> ➢ Effecting a change in the structure, staffing, or style of an organization

> ➢ Developing or acquiring a new or modified information system

> ➢ Constructing a building or infrastructure

> ➢ Implementing a new business process or procedure

Project management according to PMI (2013) was defined as the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements through the uses of the process such as: Initiating, Planning, Executing,

Monitoring and Controlling and closing. According to Norizam, (2013) states the project management was successful when the primary objectives have been met. These three primary objectives according to him were: delivery or completion on or before the date agreed with the customer, completion within the budgeted cost and a project that meets the set standards of quality.

According to ECoTEMPA (2007) on their annual report define construction project management as managing: construction planning, design services and works phases, time and progresses including productivities, cost and cash flow, quality and specifications, and stakeholders and organizational behaviors with organization resources by planning, organizing and coordinating implementing, monitoring, controlling and evaluating: (processes, resources, stakeholders with in quality, time, cost and environmental constraints).

The construction sector was effective human resource planning and thus enhances high community participation in the construction production processes. This participation can create a challenge to the construction industry. Thus, clients, project managers, design professionals, contractors and construction managers are required to demonstrate sound managerial skills on construction projects (Alice Umulisa, et al.,2015). The environmental impact such as the sound of equipment and heavy operations on large construction projects can be extreme to the community and constitute unnecessary interference. This necessitate adequate community liaison in the planning phase of every construction project.

The outcome of construction projects is a product of processes and stages from conception to final delivery of projects. The effectiveness of strategies and approaches human resource planning in the construction developmental process will positively affect construction workers' efficiency. Hence, the construction project developmental process from inception stage and highlights the basic tasks of project managers, from commencement of a construction project to the satisfaction of clients' requirements.

2.2.1. Project management was cost control

Yes, effectiveness of human resource planning and management was only possible with effective project management (Tefera, 2013). But it was equally true challenge

we say it that effective project management was only possible with effective project cost control. Yet, despite its crucial importance, cost control remains a much neglected subject, in that it was preached far more than it was practiced. More often than not cost monitoring was accepted and passed off as cost control and that exercise only starts in earnest after construction starts on site, which was far too late. Cost control should start with the conception of the project, since from then on, as the project takes shape, the ability to control costs steadily diminishes although the actual cost of exercising that control steadily increases. The relationship of cost to time in the project might perhaps be illustrated by a simple analogy. Such as:

➢ Labor costs (for staff, external suppliers, contractors and consultants)

➢ Equipment costs (for example computers, furniture, building facilities, machinery and vehicles)

➢ Material costs (such as stationery, consumables, building materials, water and power)

➢ Administration costs (such as legal, insurance, lending and accounting fees).

2.2.2. Perform time management

The effectiveness of human resource planning and management systems was only possible with effective time management (I. Othman, 2012). The time management process was the method by which time spent by staff undertaking project tasks was recorded against the project. Recording the actual time spent by staff on a project has various purposes. It was used to:

➢ calculate the total time spent undertaking each task as well as the total staff cost of undertaking each task in the project.

➢ K2enable the project manager to control the level of resource allocated to each task.

➢ identify the percentage of each task completed as well as the amount of outstanding work required to complete each task in its entirety.

Time management was undertaken through the completion and approval of timesheets. A timesheet was a document which records an allocation of time against

a set of project activities listed on the project plan. Timesheets were typically completed weekly, by all members of the project. This includes project staff, contractors and often suppliers. According to Ayob.Norizam, (2013) states that if timesheets were not recorded, then it may be difficult to accurately assess the amount of time spent undertaking project activities, and therefore become impossible to manage the project constraints of time, cost and quality.

2.2.3. Perform Quality Management

The effectiveness of human resource planning and management systems was only possible with effective quality management (Pheng, 2013). A quality management process was a method by which the quality of the deliverables and management processes were assured and controlled during a project. The process involves undertaking a variety of reviews to assess and improve the level of quality of project deliverables and processes.

2.2.4. Perform risk management

A risk management process was a method by which risks to the project were formally identified, quantified and managed during the execution of the project. The process entails completing a number of actions to reduce the likelihood of occurrence and the severity of impact of each risk. A risk process is used to ensure that every risk is formally identified, quantified, monitored, avoided, transferred and/or mitigated (Thanet, 2015).

Therefore the effectiveness of human resource planning and management systems was only possible with effective risk management (Ayodeji, 2015). Although a risk process was undertaken during the execution phase of the project, risks may be identified at any stage of the project life cycle. In theory, any risk identified during the life of the project will need to be formally managed as part of the risk management process. Without a risk management process in place, unforeseen risks may impact the ability of the project to meet its objectives. The risk management process is terminated only when the execution phase of the project is completed.

2.3.   Effective construction project management system

Project management, like so many other business applications, lends itself well to automation. As long as you can put software to work quickly and don't have to spend excessive time working through software limitations, duties such as schedule control especially where graphics are employed can be made quick and efficient. If you need to manage a large body of project-related scheduling information, software makes more sense than trying to operate a system by hand. The best kind of software program is one that lets you, as project manager, input and review information without having to wait for someone else to process it for you.

2.4.   Project effectiveness criteria

One of the topics in the project management plan is the project success criteria. These are the most important attributes and objectives which must be met to enable the project to be termed a success. It is always possible that during the life of the project, problems arise which demand that certain changes have to be made which may involve compromises and trade-offs to keep the project either on programmed or within the cost boundaries. The extent to which these compromises are acceptable or permissible depends on their scope and nature and require the approval of the project manager and possibly also the sponsor and client. However, where such an envisaged change will affect one of the project success criteria, a compromise of the affected success criterion may not be acceptable under any circumstance (Lele et al., 2013).

For example if one of the project success criteria is that the project finishes by or before a certain date, then there can be no compromise of the date, but the cost may increase or quality may be sacrificed. Success criteria can of course be subjective and depend often on the point of view of the observer. Judged by the conventional criteria of a well-managed were project cost, time and performance. The failed in all three, as it was vastly over budget, very late in completion and is considered to be too small for grand opera. Despite this, most people consider it to be a great piece of architecture and a wonderful milestone.

2.5.   The Construction Resource management

The construction sector performance is majorly dependent on manpower, materials, machinery and cash (Albert P. C. Chan et al., 2004). The resources majorly attributed

to the construction sector are manpower, materials and machinery, as discussed earlier. Nevertheless, the construction workforce activates materials and machinery resources, and substantially determines construction project efficiency and delivery cost. In other words, the performance of construction materials and machinery resources is a product of effectiveness and efficiency of human assets in the construction industry. Therefore, this necessitates the need for improvement of construction manpower for increased efficiency of construction resources.

Human resource was the source of more risks than construction materials and machinery (Shabnam Y.et al, 2013). However, Oluseyi Julius, (2014) expresses labour productivity as a degree of output (work done) obtained by a combination of various inputs (resources). Hence, it can be concluded that the combination of various inputs in the construction sector has not yet produced optimal results, and significantly affects the quality of construction output. The present state of workforce performance in the construction sector necessitates the improvement of the efficiency of the construction workforce.

2.5.1. Material Resources

In construction projects, the cost of materials and plant components represents approximately 70% of the project sum in civil engineering projects, while materials cost represents 45% - 50% in housing and commercial building projects (Oluseyi Julius, 2014). Construction materials require significant considerations to reduce construction waste, or the loss of construction materials that could ultimately affect all aspects of construction projects (T.Subramani P. M.et al., 2014). Hence, the availability of construction materials at the right place and at the right time was essential to construction project success. However, non-availability of construction materials was identified by as the primary factor affecting the efficiency of construction operations. The factor causing non-availability of construction materials to include, waste due to negligence/sabotage, difficulties in transportation of materials on site, improper handling of materials on site, inadequate usage of materials to specification, lack of effective plan of work to be carried out, improper delivery of construction materials to site, and materials requisitions are subject to excessive paperwork.

2.5.2. Machinery Resources

The complexity involved in contemporary building construction projects creates difficulties when assessing alternatives to existing construction equipment (Oluseyi Julius, 2014). The study undertaken by reports construction equipment as being the most significant factor in the construction industry that effects on HRPM systems effectiveness. The long term impact of equipment technology on HRP efficiency at the level of HR activity posited that advances in equipment technologies have led to an improvement in productivity of the majority of production activities. The authors emphasized the importance of adequate implementation of equipment technology as a means of enhancing productivity of the human resource planning in construction industry. K2In addition to this, the complexity of construction operations, age of equipment, and type of equipment, equipment quality and degree of usage were reported by Anna Dubois, (2018) as significant factors that considerably affect.

2.5.3. Human Resource (HR)

Human Resource (HR) was also defined as the knowledge, skill, experiences, energies and attitude employed by organizations which were potentially useful for the production of goods and services.

HR was recognized not just in terms of hours work but also skill, knowledge, attitude, experience and similar attributes that affect particular human capabilities to do productive work and would be most suitable for the realization of their purposes, aspirations or objectives (Ayodeji O. J.et al., 2015). Therefore HR were largely a the factor of efficiency/productivity of any organization, whether it be construction or manufacturing but in them having the requisite skill, training, education, experience and attitudes that would be most suitable for their purposes, aspirations or achieving objective (Ghodrati et al., 2018).

2.6. Human Resource Management in Construction Industry

The current practices in the construction environment were dynamic, complex and under-developed in respect to human resource management Loosemore & Dainty, (2014) Consequently, most academics opinions concerning the approach of the construction industry with regard to human resource management are disjointed from the realities of construction activities (Abhishek, 2017). A major challenge of

human resource management in construction was identified as the difficulty in balancing the needs of the construction project, the organizational requirements and the needs of the construction workforce (Tukur, 2015). Notably, a typical distinguishing factor of the construction industry was the uniqueness involved in every construction project, which highlights the necessity of exhibiting a clear understanding of the construction industry in order to understand the human capital involved (Huemann & Keegan, 2013).

According to Sadananda (2018), quality is contained in the support of construction management; it does not only impact appearance and durability but also the performance of a project. Performance evaluation in construction project generally focuses on a limited number of performance elements which was the act of achieving the project goals related to the product, which were completing the project on time, within budget and with the required quality and to client satisfaction.

Nowadays, private sector place more emphasis on the profit rather than the quality and time which was the major concern in the past (Ameh, 2017). Therefore, in order for construction firms to realize forgoing performance elements of construction project optimally, the concept of HRM efficiency must be stressed in the firms to improve the quality of product and services (Lele et al., 2013). The willingness to change the quality of HRM will determine the success of total quality and time management in the firms. Quality and efficiency HRM have been identified as the major imperatives lacking in Ethiopian construction firms.

2.6.1. Human resource planning

According to Andrew RJ Dainty et al., (2000) improvement on human resource planning was critical to overall productivity and cost effectiveness in the construction industry. This study assesses the Effectiveness of human resource planning and management practices in the construction industry of organization and the challenges confronting it. Human resources are typically classified by the skills they bring to the project: carpenter, steel fixer, welder, painter, operator, inspector and engineer among others. Sometimes, the available labour lacks the skill and expertise to effectively execute their mandates in the project. It was for this reason that once the project team or contractor get effective workforce, they find it very difficult to release them. They

feel that they may get jobs elsewhere and lose them. Human resource management also radically affects the total cost of the project because it controls the productivity of materials and equipment that constitutes the remainder of the direct costs (Andrew RJ Dainty et al., 2000). They will then tend to hold on to them even when there was no work for them at the moment.

According to Samwel et al., (2018), states one of the major planning documents was the project management plan that includes PM activities such as quality assurance, risk management, and procurement and contracts. Usually, the authorities request the full details to be submitted for approval through a strict documentation life cycle. However, the updating of the project management plan was not as strict as the initial approval. Roles and responsibilities must be clear in the project plan. Organizational planning involves identifying, documenting, and assigning project roles, responsibilities, and reporting relationships.

According to Sandip Pawar et al., (2015) project, human resource planning primarily focuses on determining the size of the project workforce; it's structuring into functional groups and worker's team and scheduling the manpower. To determine the number of workers needed to perform a given job in the specified time, data- wise forecasting of the workers requirements for accomplishing the project work, and finally, organizing the planned work.

2.6.2. Employee Training

Nowadays, organizations know proper training needs to establish a proper system. Training is referred to as a systematic approach to learning and development to improve individual, team, and organizational effectiveness (Hassn, 2015). Training is the systematic development of the attitude and skill behavior pattern required by an individual in order to perform adequately a given task. Training tried to change the behavior of the employee in the workplace to increase employee's skills according to standard which exists in the company. The organizations usually implement training when they want to change process of manufacturing or service, training for new skills gives opportunity for better career paths (within the company or in the labor market), higher income and employability. The companies should improve continually employee's skills and attitude by training and manpower development to ensure

enforcing optimal performance. As shown in figure 2.1 manpower training and development can change and improve the level of ability and attitude of the employees in the workplace.
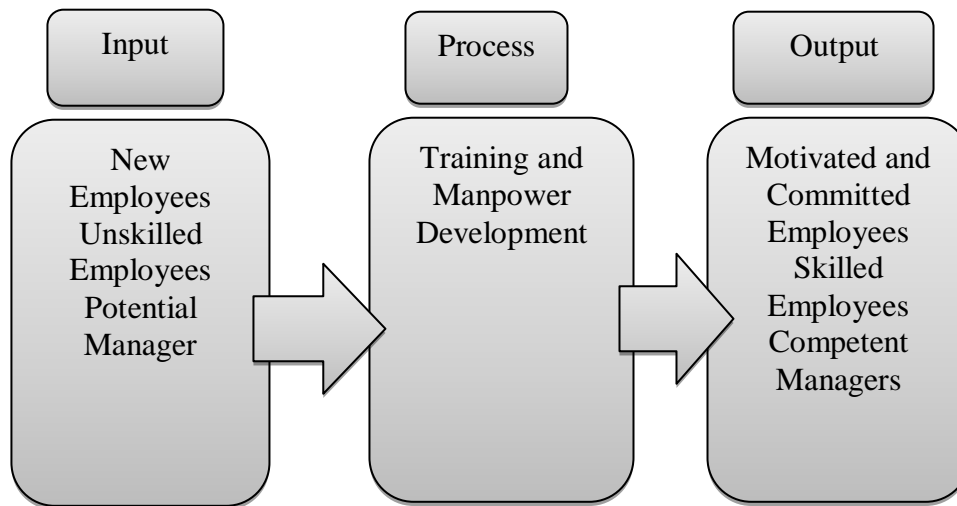
Figure 2-1: Manpower training's model (source Oluseyi J., 2014)

2.6.3. Employee Motivation

Oluseyi Julius, (2014) Define motivation as "the characteristic of an individual willing to expend effort towards a particular set of behaviors". Construction worker motivation was a significant factor in the growth of construction productivity (Ade Abdulquadri et al., 2015). The authors define the content theory of motivation as being based upon individual needs resting on psychological needs that demand satisfaction. On the other hand, a process theory focuses on the thought that runs through the mind of individual workers and affects their performance. Benviolent, (2014) claim that productivity was related to workers motivations, and worker motivation was directly linked to construction productivity. Atkins (2017) argued that HRP construction industry can be made more efficiency/ productive by adopting the right system of motivation.

According to Tabassi, (2015) states construction managers' knowledge of workers' motivating factors can help construction management to develop approaches for improving construction workers motivation. The quality of human performance is significantly dependent on motivation, where an increased motivation brings

increased productivity and vice-versa. Therefore, managers should understand individual needs to create a better work environment for construction employees

Efficiency of HRP in construction industry requires employers to recognize the driving forces of their employees (financial and non-financial). Hence, there was a necessity to consistently evaluate individual needs of employees by construction managers. Oluseyi Julius (2014) identifies employee motivational drives and demotivating factors that enhance job satisfaction and dissatisfaction as consisting of the following:

* **Motivation drives**

  ➢ Achievement

  ➢ Employer recognition

  ➢ The work itself

  ➢ Taking responsibility

  ➢ The chance to advance

* **Demotivating factors**

  ➢ Working conditions of employees

  ➢ Poor Salary

  ➢ Poor relations with superiors

  ➢ Policy of organizations

2.6.4. Recruitment and Selection

According to Kanu (2015), states the definitions of recruitment was a practice of attracting potential applicants having the required qualities to fill available job openings within the firm. Recruitment was the method of producing a "pool of" competent individuals "to apply for" work to a company. This means that it was an obligation for an organization to activate peoples' interests to apply for jobs. Recruitment was a vital constituent of a company's blanket staffing policy and it was the practice of attracting qualified and competent individuals to a specific work from internal or external sources.

According to Kanu, (2015), states in his review of HRM practices and policies of high performance companies, found that proper application of recruiting and selecting procedures boost employee productivity, increase organizational performance, and contribute in diminishing turnover. However, poor application of the recruitment and selection practices poses detrimental effects; blocking the company from achieving its objectives thereby dwindling its competitive edge and market share. High training and development costs; high disputes and disciplinary problems; absenteeism; low productivity; and high turnover are common factors that accompany poor application of recruitment and selection practices.

2.6.5. Communication management

Walker (2005), states the information considerably contributes to the achievement of construction project objectives. The define communication "as the transmission of information resources and others including ideas, knowledge, specific skills and technology from one person to another through the use of shared symbol and media". The subject of communication in the construction sector was a challenge, as workers in a team planning to achieve the same goal were brought together from different firms and backgrounds. Nevertheless, the effectiveness of HRP in construction industry was significantly depends on the clarity of information on the job requiring execution. Identify effective communication as a fundamental factor for human resource planning and management systems to consider in order achieving project success.

Due to the fragmented nature of the construction sector, poor interpersonal communication leads to conflicts and disputes (Walker, 2005). However, as a result of multilingual practice on a construction site, report a conflict between two trades on a construction site that led to wastage of 30% of formwork in a multi-story building. Moreover, the study revealed a lack of a shared language between construction managers and the construction workforce as constituting a source of frustration for, and ineffectiveness on HRP. The claim that on most construction sites, employees are not informed about the plan of work early enough, but were mostly informed close to the commencement of daily activities. This may be detrimental to construction workers' efficiency. Maintain that a significant reason

for lack of co-operation between construction professionals lies in a lack of effective communication.

2.6.6. Team Acquirement

Team acquirement is the process of obtaining the human resources needed to accomplish the project. It may include any additional stakeholder whose role has not yet been filled. Acquirement extends to engineers, contractors, subcontractors, and suppliers. Project staff assignments are the set of documents that refer to acquiring the staff officially. This parameter encounters serious attention in the construction industry. Most of the participants appreciated the documentation process for staff assignment, including the project WBS, procurement process, policies and regulations, recruitment rates, qualifications, required training, and resource allocation with respect to the project schedule

According to Azmy et al., (2012), states the success of a company or business was directly linked to the performance of the people that work for that production. Since every organization is made up of people, acquiring their services, developing their skills, motivating them to higher level performance and ensuring that they continue to maintain their commitment to the organization were essential prerequisite to achieving organizational objectives. The process of making efficient and effective use of HR so that the set goals are achieved was referred to as HRM. There was no general agreement on what constitute HRM practice in literature.

2.6.7. Team management

According to Santosh, (2016) define management team effectiveness in terms of both high performance and employee quality of work life. This idea draws from socio-technical theory, which states both social and technical systems must be maximized for optimally effective teams (Azmy, 2012).

Team management involves the processes of following performance, providing feedback, resolving issues, and coordinating changes to enhance project performance. Managing team members on construction projects was a major challenge because of the loyalty to the functional manager in the governmental

association. In the private sector, this aspect has been nullified, and most of the employees on the construction projects are following the project organization matrix.

According to Santosh, (2016) states a team management can be defined as: "A small number of people with complementary skills, who are committed to a common purpose, performance goals, and approach for which they hold themselves mutually accountable." A simple sequence of events required in achieving effective teamwork and team synergy was as follows: *Respect → Trust → Openness →Synergy = Teamwork*. When team members establish respect among each other, the trust will soon develop. Open Communications result from trust and will, and, therefore, produce genuine team management.

Another parameter that affects team management was the change in project staff that reduces the performance of the project drastically. This change has more effect when the change was in the top management of the project. Despite the fact that changes in the government managing positions were rare for construction projects, when it occurs, it can ruin the project in terms of time and cost. Corrective action was a serious parameter in team management (Kirimania, 2012)

According to Atkins et al., (2017), states the main aim of team training was focused more on the ability to master and become skillful in the performance of a particular task, the thrust of development was to maintain highly competent teams that were abreast of the competitive global market demands to fulfill future organizational workforce needs. Training can be defined as the formal and systematic modification of behavior, attitudes and skills that are critical for successful job performance through learning experiences which can occur through education, instruction, development and planned experience.

According to Lele et al., (2013), states as a systematic process for improving organizational performance by developing the performance of individuals and teams performance management. It was a means of getting better results by understanding and managing performance within an agreed framework of planned goals, standards and competency requirements.

Team performance management aims to help organizations understand systems of evolving and managing high performance for overall production improvement and

effectiveness. The concept of team performance management as, "The real concept of team performance management was associated with an approach to creating a shared vision of the purpose and aims of the organization, helping each employee understand and recognize their part in contributing to them, and in so doing, manage and enhance the performance of both individuals and the organization".

2.6.8. Team development

According to Hassn et al., (2015) states the effectiveness of HRM practices were ensuring organizational success and achieved organizational objectives and concerned constitutes factors such as planning, training, recruitment and selection, team development, and team management system. Team development was the process of improving the competencies and interaction of team members to enhance project performance. In this process, individual and group skills need to be enhanced to improve the overall productivity of the project. Assessment of the performance was a milestone in the modern management processes. Team performance assessment provides a clear picture of an integrated working team. Unfortunately, despite the fact that most teams in the construction industry work together on several projects, the participants indicated that the assessment process is seldom conducted.

According to Samwel et al., (2018), emphasized the organizational initiatives need integration with the HR practices for successfully integrating corporate strategies. When all strategic initiatives i.e. growth, better customers service, innovative production methods, improvements in after sale services, mergers, etc. possess an alignment with HR practices and policies of the organization e.g. with organizing, communicating, developing, appraising, and rewarding employees, and keeping an eye on the future capabilities of the organization, the chances of successful and better resulting implementation of strategic plans increase. The HR practices also need to be aligned with objectives of the organization.

Organizational process assets help project planning based on accumulated information from previous projects. The status in the government sector showed that these assets had already accumulated over the past years in the form of templates or checklists, roles and responsibilities, and safety considerations.

2.7. Efficiency and effectiveness HR management in construction industry

2.7.1. Concept of efficiency and effectiveness

The concepts of efficiency and effectiveness are commonly used when evaluating different processes. Since project management organizations are often struggling with the balance between time, cost and quality. They are interested in doing this as efficient and effective as possible. However, there are a wide variety of views on efficiency and effectiveness among professionals and research scholars, which makes it difficult to apply these concepts in project-based settings.

The concepts of efficiency and effectiveness were commonly defined to competencies for project execution. A synonym for success, according to (Ruben V., (2013) states the effectiveness was the degree of achievement of objectives. Projects are formed to accomplish objectives and success is measured in terms of how well these objectives have been met. Criteria such as meeting project time, budget, technical specification and mission to be performed are the top priorities of project objectives.

According to Ruben V.et al., (2013), expressed the project success was measured against the overall objectives of the project (i.e. time, cost, quality, and project mission). More specifically, the concept of success in a construction project according to some researchers was corresponding to the efficiency and effectiveness measures.

Project success was in terms of efficiency and effectiveness measures. Efficiency measures refer to strong management and internal organizational structures (adherence to schedule and budget, and basic performance expectations). In other words, efficiency measures deal with 'time, budget and specifications'. Effectiveness measures refer to the achievement of project objectives, user satisfaction and the use of the project. A project delivered on time, within budget, and meets performance specifications may not be well-received by the client/users for whom it is intended.

The project efficiency was concerned with the utilization of equipment and workforce, whereas effectiveness is concerned with the achievement of outcomes. They also the efficiency of construction projects involves the utilization of resources,

which may be represented by the ratio of the resources expected to be consumed divided by the resources actually consumed.

The effectiveness of a construction project, on the other hand, is when the organization's objectives are fully attained. The project efficiency and effectiveness were by indicating that a system effective if it achieves its objectives. Since construction projects are directed towards client's objectives, an effective construction project should meet the client's objectives.

According to T.Subramani et al., (2014), describe the evaluation of project success was from the efficiency and effectiveness dimensions. Project efficiency ("doing the thing right") was concerned with cost and process management (i.e. the efficient conversion of inputs to outputs within budget and on schedule) and a wise use of human, financial and natural capital. While, project effectiveness ("doing the right thing") was concerned with the development of worthiness or appropriateness of the chosen project goal.

In the field of quality management, the concepts were applied in a more defined way. In QM, efficiency refers to doing things right, i.e. whatever is performed, it is performed in the most suitable way, given the available resources (high efficiency). Effectiveness, on the other hand refers to doing the right things, i.e. selecting and focusing on producing an output that there is a demand for.

The Efficiency was then applied as an internal process rating, while effectiveness is applied as a customer satisfaction rating. The highest degree of efficiency was the obtained when a process is: free from defects, have a low unit cost, short cycle time, no waste, and low cost of poor quality. High effectiveness, in turn, was obtained when the process output exceeds most customer requirements.

2.7.2. Effectiveness of human resource management systems

HRM policy have been established, those configurations guide employee behavior and are associated with differing levels of organization effective-ness. Byrom (2006), found that construction firms with higher levels of strategic, including human resource, planning have achieved higher organizational performance, including higher productivity, greater cost effectiveness, and greater overall efficiency.

Effectiveness of HRP management was the extent at which a project achieves objectives and production objectives. Various work area sticks have been offered for measuring project effectiveness. It was in fact traditionally agreed that project effectiveness was measured by the potential to meet budgeted time, cost, and quality goals. However, project effectiveness can also be measured by the main factors of Effective human resource management.

According to Takim R. et al., (2008), the identification of HRPM effectiveness measures were associated with project 'results' in terms of accomplishing core business and project objectives, users' satisfaction and the use of the project as identified

Client and User Satisfactions

According to Adanan (2006), states the client was satisfied when the project was delivered to quality, reliability, on-time deliveries, high service levels and minimum cost of ownership. He cited that two possible criteria which could be used to measure project success from effectiveness dimension are the resultant system (i.e. the product) which meets customers' satisfaction and benefits many stakeholders such as users. End-users will not be happy if the end product does not meet their requirements in terms of functionality and quality of service.

Level of Effectiveness (achievement of outcomes)

Effectiveness encompasses the attainment of the organization's objectives both at the corporate level and project level (Adanan., 2006). It can be measured against the objectives earlier set by the client organizations and HRM effectiveness measures refer to user satisfaction that a system was effective if it achieves its objectives and since construction projects are directed towards client's objectives, an effective construction project is one that meets its objective.

Project Functionality and 'Fitness for Purpose

According to Adanan (2006) states, the client satisfaction was in terms of the functionality of the finish product, meeting safety requirements, flexibility, time, and quality. They found that 73% of those who are interested in keeping existing facilities functional are clients whose works were mainly concerned with alterations and renovations.

Free from Defects

According to Takim (2008) defines the cause of building defects into lack of skill, lack of care and lack of knowledge of the site operative and difficult to build, low design and missing project information. It is a mixture of technical inadequacies, managerial inadequacies and operative's skills. In order to avoid construction defects, one way is to impose quality control during the construction process.

Value for Money

A fundamental term in project management is a measure expressed in currency, effort, exchange, or on a comparative scale which reflects the desire to obtain or retain an item, services or ideal (Sadananda p. , 2009). Typically, the analysis sees 'value' in which the 'benefits' to each party were perceived as value. Earlier work on 'value for money' equated value for money in terms of cost reduction and higher quality thresholds, which lead to greater client satisfaction. Value for money is the optimum combination of whole life cost and project quality to meet a client's need and expectation, and value management aims to maximize the functional value of a construction facility to the clients. Value for money is an effectiveness measure of HRM success.

Profitability

According to Erik Sundqvist et al., (2014) states the profitability was measured in the Post-construction phase when the final account was settled and both the paying and the paid parties can be sure of the financial result regards profitability as revenues generated by firm exceeding the cost of producing the revenues.

Absence of any Legal Claims and Proceedings

Claims in construction can be based on the contract itself, a breach of contract, a breach of some other common law duty, a quasi-contractual assertion for reasonable (quantum merit) compensation, or extra ex-gratia settlement request. Some construction claims are unavoidable or necessary to contractually accommodate unforeseen changes in project conditions or unavoidable changes in client's priorities.

According to Takim, (2008) states the absence of any claims or proceedings on projects was the major criterion to all parties (client, designer, and contractor) for measuring project success. Whenever a project was completed without using

jurisdiction to settle conflict, the construction project can be considered efficient. Claims managers should focus not merely on the significant claims categories but also on the avoidable ones, so as to minimize the damaging effects on a given project (Sundqvist, 2014). In certain cases this variable could also be associated with HRM efficiency measures.

Learning and Exploitation

Learning addresses specific criteria in terms of organizational learning, changes in knowledge structure, on-going improvements and feedback. According to (Al-Mustapha (2017), the learning and growth perspective focuses on internal skills and capabilities, in order to align them to the strategic goals of the organization. Learning and exploitation can be defined as the process of improving actions through better knowledge and understanding.

Generate Positive Reputation

In construction project development, project clients are more likely to have a favorable impression of a contractor's company if they have a positive experience in the services offered with a good quality finished product tailored to their initial needs and expectations (Othman, 2018). In this respect, maintaining a company's positive image and reputation could be an effectiveness measure of project success to contractors and project consultants by creating good results in performance while implementing projects development. A positive reputation may be generated by working closely with construction project management, identifying opportunities for operational improvements, exploiting new technology, product or markets, identifying management information requirements, and resources constraints in offering well defined services and delivering an expected product that fits the client's business objectives (Sundqvist, 2014).

2.8. Review of factors affecting effectiveness of HRPM systems in construction industry.

There have been so many studies conducted previously to determine the factors affecting effectiveness of HRPM systems in construction projects in the developed and developing countries. Past studies and research shows the number of factors affecting effectiveness of HRPM, there are still anonymous factors need to be further studied even in developed countries. Knowledge and understanding of the various

factors affecting HRM effectiveness was needed to determine the focus of the necessary steps in an effort to reduce project cost overrun and project completion delay, thereby increasing efficiency and overall project performance. Deferent factors affecting effectiveness of HRPM reviewed from past studies were summarized and discussed as below:-

According to Mbachu, (2018) based his study on critical factors which influence the effectiveness of HRPM systems in construction project. These factors were identified based on Personal analyses of construction project managers were done:

Physical Factors**:** Site congestion factor will never enable the labor to do work in a comfortable manner and overtime work will not give good productivity in any job. In most of the cases design complexity will affect the speed of work.

Economic Factors**:** On time payment should be done right at the time when the work was accomplished. Discontinuity of work schedule will affect labors financial status and sufficient amount of pay should be given to labor.

Psychological Factors: Psychological factors deals will many parameters. In civil Engineering point of view, in recent years the cultural difference was making the worker to work uncomfortably and work satisfaction with respect to job is very much necessary.

Organizational Factors: Quality of work was good/maintained infirm. Sufficient team size should be provided by the firm for accomplishing the task. Accommodation and food should be maintained in a better manner by the top manager.

Environmental Factors: It was very clear to mention that climatic condition will affect the working performance. The project manager and the site supervisor should always maintain the site condition in a good manner.

Design Factors**:** Innovative design methodology creates discomfort in the work but proper training approach will eradicate this problem. It is must say that violation of code practices by the firm should be totally abolished only the design problems won't occur.

Material Factors: It is necessary to supply quality materials by the firm at any cost but in some cases desolate materials are used in small scale firms. Another serious problem is the co-workers are mishandling the materials due to lack of training.

Equipment Factors: Usage of mechanical equipment's for a prolonged period of time is still found in most of the firms and due to this factor equipment malfunctioning will take place often. It was necessary to have proper maintenance of equipment and proper training for operating equipment's to the labors.

Project Factors: Sufficient men and materials are not found in some working site due to this factor the time period for accomplishing work is delayed. A good transportation facility should be provided by the firm to the labors.

External Factors: Political (Governmental) problems often aroused in some firms and due to this work schedule is disturbed .In small scale firms, resources are managed in an improper manner whereas in partnership based firms contractual conflicts are found. Above factors are studied and analyzed for their impact on human resources.

Malkani, (2013), studies of factor affecting effectiveness of HRPM at a building construction project in USA was identified about 40 factors affecting HRPM efficiency and categorized them into five groups as follow:

Manpower factor:-lack experience absenteeism, alcoholism, misunderstanding among laborers, age, lack of competition among the laborers, disloyalty, personal problems.

External factors:- supervision delay, variation in the drawing, incomplete drawing, rework, design changes, inspection delays from the authorities, payment delays, complex designs in the provided drawings, and implementation of government laws.

 Communication factors: - change orders from the designers, change orders from the owners, misunderstanding among owner, contractors, and the designer, and disputes with the owner.

Lack of resource factors:- lack of required construction material, lack of required construction equipment, insufficient lighting, poor site condition, differing site condition plan, material storage location, poor access with in construction site, violation of safety laws, quality of required work, inadequate transportation facilities for workers, inadequate construction material. Increase in the price of material.

Miscellaneous factors: - shortage of water and/or power supply, accidents during construction, weather conditions, working overtime, and project objective not well defined.

Khyomesh V., (2018), was studded that on critical factors affecting effectiveness of project management systems in Malaysia have perceived overall 21 factors into 3 major categories as follows:

HRM at Construction Site factors: - Poor design or planning decisions, use of fresh unskilled workers, weak enforcement of legislation, site personnel and workers behavior, miscommunication between workers, poor site supervision, poor site training for the workers, lack of knowledge regarding the procedures of activities, lack of preparation regarding the procedures of activities, neglecting procedures given, and overtime working hours always needed thus reducing productivity.

 Manpower group factors:- lack of employee skills, increase of laborer age, labour absenteeism, lack of training, lack of team development, lack of team management, and lack of plan management.

Environmental group: - weather changes, project location, working with confined place, and large project size.

Safety group: payment delay, non-provision of transport means, lack of financial motivation system, lack of places for eating and relaxation.

Material/Equipment group: material shortage, unsuitable material storage location, old and inefficient equipment, tools and equipment shortages.

Schedule group: working 7 days per week without taking holiday, poor work planning, overcrowding, misuse of time schedule.

Motivation group: ignore safety precautions, accident, and no safety engineer in site, insufficient lighting, and working at high places.

Quality group: low quality raw materials, high quality of required works, rework, and quality inspection delay.

The conclusion of Morlai, (2017) was based on the group ranking his analysis suggests six main groups have significant impact on the human resource planning and

management systems in the construction projects. These are manpower group, managerial group, motivation group, material/equipment group, safety group, and quality group in descending order.

According to Zeleke, (2012) finding the most critical factors affecting building projects HR planning efficiency were levels of skills and experience of workforce, levels staff turnover, rework problems, levels of management commitment for change, project budget shortage or delay, poor incentive mechanism, employed machinery and equipment, poor condition, right of way problem and poor weather condition in descending order.

Wai, (2015) identified about 38 factors affecting effective of HR planning and management systems on building projects in Malaysia and drawn them it in to seven group categories as follows:

Material related factors: such as unavailability of materials, late delivery of materials.

Manpower related factors: lack of manpower skills, labour inexperience, absenteeism, working for long periods without holiday, inappropriate use of skills.

Motivation related factors: late payment of salaries and wages, low remuneration, lack of incentive schemes, availability of site facilities, worker retention schemes, lack of worker respect or recognition, health and safety provision.

Plant and equipment related factors: suitability/adequacy of plant and equipment, plant break-down, shortage of tools and equipment, inefficiency of equipment.

Management related factors: supervisory incompetence, instruction delays, instruction delays, inspection delays, lack of coordination, poor communication, poor management practice, poor relations between management and workers, increasing laborers in order to accelerate works, compliance to statutory regulations.

Technical related factors: alterations of design during project execution, poor site layout and organization, incomplete drawings, poor site conditions, project complexity, construction methods, crew size inefficiency, alterations of schedule, and reworks. Other factors: inclement weather, on site accidents.

Karim, (2007) on his study of significant factors affecting of HR planning and management systems at construction site in Kuwait identified about 37 factors negatively affecting HRPM systems in building construction and classify them in to five groups as:

Labor group: lack of skilled labor, lack of labor in the market, work overtime, tool shortage, labor absenteeism, labor personal problem, poor safety and health management, incentives, and bad labor relation.

Technical group: poor planning and scheduling, poor site management, rework due to construction error, lack of supervisors experience, slow response of consultants, variation/change order, design complexity, communication problems between parties, and late issues of drawing and clarity of technical specification.

Project group: disruption of power/ water supplies, project location far from suppliers, poor weather conditions, poor site drilling ability, site congestion, poor site condition, and project size.

Financial group: payment delay to the suppliers, lack of financial motivation, financial conditions of contractors, low wages, and payment delay by client.

Material and equipment group: material shortage on project site, equipment shortage, old and inefficient equipment, low qualities of materials, poor material storage location, and construction methods.

Zwikael, (2009) finding poor HR planning and scheduling, material shortage at project site, equipment and tools shortage, lack of skilled labor, poor site management systems, rework due to construction errors, old and inefficient equipment, lack of ;2supervisor's experience, payment delay to suppliers and slow response of consulting staff inspecting the work were the most critical factors affecting effectiveness of HRPM systems.

Merritt, (2014) identified factors affecting HRPM systems and grouped them into 15 categories according to their characteristics, namely:- design factors, execution plan factors, material factors, equipment factors, labor factors, health and safety factors, supervision factors, working time factors, project factors, quality factors, financial factors, leadership and coordination factors, organization factors, owner/consultant

factors and external factors. The groups of factors which have high impact on effectiveness HRPM systems according to finding were supervision factors, material factors, execution plan factors, design factors, equipment factors, owner/consultant factors, and health and safety factors in descending order.

Backlund, (2014), states on his study of impact of poor management in construction in building project in Florida identified factors such as: tools of management (planning, team acquirement, team management, and team development), equipment management, access planning, management skills, safety, quality control, manpower scheduling, employee training and development, employee age, temperature, employee motivation and degree of bilateral communication. He found the most critical factors were management skills, manpower scheduling, safety, employee motivation, and equipment management in descending order.

According to Malkani j., (2013), the most factors affecting of HRPM systems were reduced supervision effectiveness, lack of training and development, lack of recruitment, selection, decreased moral, increased absenteeism, poor workmanship, resulting in higher rework and increased accidents.

3. RESEARCH DESIGN AND METHODOLOGY

3.1. Study Area

The study area was in Adama town, which was located in eastern showa in Oromia Regional state. It was about 100 kilometers away from Addis Ababa in southeast direction.

Figure 3-1: Map of study area

3.2. Study period

The study will be conducted from the beginning of April to end of August, 2020.

3.3. Study Design

The study was used data were collected by designing structured questionnaire survey. The distribution of the questionnaire to the main stakeholder such as contractors and consultants and interview about the project was conducted. The data was analyzed by using the quantitative approach used to gather the data to satisfy and to fit the objectives of the study. The research study framework is given in figure 3.2.

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                    │    Research Proposal     │
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                                ▼
                    ┌─────────────────────────┐
                    │  General Review of Relevant │
                    │        Literature        │
                    └─────────────────────────┘
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                                ▼
                    ┌─────────────────────────────┐
                    │ Development of Conceptual and │
                    │   Theoretical Frameworks     │
                    └─────────────────────────────┘
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Figure 3-2: Process of research

Research Proposal

General Review of Relevant Literature

Development of Conceptual and Theoretical Frameworks

Research Objective

Research Questions

Formulation of the Research Method

Population and Sampling

Data Collection
(*Qualitative and Quantitative approaches*)

Quantitative Data   *Questionnaire*   *Interview*   Qualitative Data

Data Processing and Analysis
(*Analysis of data for conclusion*)

Development of Framework for the Effectiveness of HRPM

Submission of Thesis for Examination

Figure 3-2: Process of research

3.4. Population of the study

The gathered information through the study of a research was known as a population. This population was the different experts in the construction projects. Those experts were the role players in the public building construction projects. The contractors and consultants were the population that involved in the public building construction projects in the Adama town.

3.5. Sample size and Sampling procedures

3.5.1. Sample size

The contractors and consultants are the targeted groups of this study. According to the Adama town, there are 29 Contractors and 15 Consultants undertaking in the public building projects in Adama town. The sample size can be calculated as the following equation, in order to achieve a 94% confidence level (Assaf et al., 2001).

n= n'/ [1+ (n'/N)]

Where: -

N = Total number of populations

n= Sample size from finite population

n' = Sample size from infinite population = S^2/V^2; where S is the variance of the population elements and V is a standard error of sampling population. (Usually S= 0.5 and V = 0.06). Therefore, the questionnaire was distributed to 21 Contractor and 12 Consultants to achieved 94% confidence level.

3.5.2. Sampling procedures

The sampling procedures were used due to the nature of respondents to be involved in the study. Contractors and Consultants were registered in Adama town that participated in the public building projects. Random sampling was used to select Consultants and Contractors. According to Kombo, (2006) random sampling was the probability where by people; place or things were randomly selected. 29 local contractors and 15 consultants registered in Adama town were randomly selected.

And a public building construction project was constructed by the public organization in Adama town was selected by using purposive sampling.

According to Trochim., (2006), purposive sampling is a useful sampling method that allows a researcher to get information from a sample of the population that one thinks knows most about the subject matter. By designing the structured questionnaire survey assessing the factor affecting effectiveness of human resource planning and management systems in public building construction project in Adama town was randomly selected. A questionnaire survey was randomly sampling to the person of contractor and consultant, and towards the factor affecting effectiveness of human resource planning and management systems in public building construction projects in Adama town and the category level of contractor-grade one to contractor grade five were randomly sampling selected. The designing questionnaire statement was to cause the respondents' opinions of the factor affecting effectiveness of HRPM systems on a five-point Likert scale, with point 5 representing very high impacts, point 4 representing high impacts, point 3 representing medium impacts, point 2 representing low impacts, point 1 representing very low impacts.

Table 3-1: Values assigned for the Likert scale in the questionnaire

Scale	Item
5	Very High Impacts
4	High Impacts
3	Medium Impacts
2	Low Impacts
1	Very Low Impacts

The sample selected for each of the two groups is described below as:

➢ Consultants working in public building construction project

➢ Contractors who are involving in the public building construction project

3.6. Study variables

3.6.1. Dependent variable

Effectiveness of human resource planning and management systems in public building projects is the dependent variable.

3.6.2. Independent variables

Management Related Factors, Sub-Contractors Related Factors, Labor Related Factors, Motivation Related Factors, Construction Material Related Factors, Construction Machine Related Factors and External Related Factors.

3.7. Data collection process

The data will be collected from primary and secondary sources. Primary data sources include questionnaire and interview while secondary data sources include journals and internet sources.

3.8. Reliability of data

According to a researcher George, (2003) Cronbach's coefficient alpha was designed as a measure of internal consistency. Cronbach's coefficient alpha can be used to check the reliability of the questionnaire. The normal range of Cronbach's coefficient alpha values between 0.0 and + 1.0. The closer the alpha is to 1, the greater the internal consistency of items in the instrument was assumed. The equation used to analyze Cronbach's coefficient alpha was:

$$\alpha = \frac{kr}{1 + (k-1)r}$$

Where:

a = Cronbach's Coefficient Alpha

K = items (variables) in the scale and

r = the average of the inter-item correlations.

For this study all 52 variables with the rates given by 30 respondents were feed in to SPSS software then reliability analysis was carried out using Cronbach's alpha model.

3.9. Data processing and analysis

The factor affecting effectiveness of HRPM systems in public building construction projects were determined according to the questionnaire survey data. The RII and SPSS V20 was the main tool of this research which was the questionnaires were prepared and analyzed. The collected data from respondents was checked for accuracy, completeness, consistency, and reliability across all data sources. The score assigning to each factor by the respondents represents the degree to which the factor contributes to overall factor affecting effectiveness of HRPM systems. All collected information from survey data was checked and verified for the correctness by the principal investigator.

For primary data analyzing relative importance index (RII) analysis was used. For all factors the important index was calculated and the index vales were ranked. And also the group index was calculated by taking the average RII values in each group. Then spearman's rank correlation coefficient was used to measure and compare the association between the rankings of two parties for single factor. For this study spearman's rank correlation was calculated using SPSS software for both contractors and consultants. The respondents of this research were only contractors and consultants and therefore correlation is required for both only. RII was determined based on the formula:

$$RII = \frac{\sum(f_i w_i)}{5N}$$

Where:

RII = Relative importance index

fi = number of respondents under each level

wi = was the weight given to each factor by the respondent, ranging from 1 to 5

N = Total number of respondents

Analyzing the data from the gathering information and ranging by using RII value between 0<RII ≤ 1, the highest value of RII, the most factors affecting effectiveness of HRPM.

3.10. Correlation Coefficient

Spearman's Rank Correlation Coefficient Method Rs is a non-parametric test that was used to measure the correlation between two parties' ranking because of the limited number of filled questionnaires. In this research, it was used to show the degree of a ranking of the different factors. The value of Rs ranged from -1 to 1 indicated as if -1 or 1 perfect negative or positive correlation, between -1 to -0.5 or 0.5 to 1, strong negative or positive correlation, between -0.5 to 0 or 0 to 0.5, weak negative or positive correlation and 0 no correlation. Computed using the following equation:

$$Rs = 1 - \frac{6\sum d^2}{n^3 - n}$$

Where:

Rs = the Spearman rank correlation coefficient between two parties,

d = the difference between ranks and n = was the number of pairs of rank.

The Spearman rank correlation Coefficient between a variable of this research is analyzed by using the SPSS v20 and the result is shown in table 4.8.

3.11. Ethical considerations

The research is free from any political consideration; it is based on the academic perception. The researcher also assuring that the names of respondents will not be reveal in the study and this research is informed to the permission participants. Finally, the researcher took appropriate measures to ensure the research would cause no physical or psychological harm to research participants. As a general rule, therefore, the study did not raise any ethical concerns.

3.12. Data quality assurance

The data will be checked to be more accurate. However, if there is error or inconsistence on the data, the sample will be taken again and again.

4. RESULTS AND DISCUSSIONS

4.1. Questionnaire Distribution

The questionnaire was designed to provide based on type of organizational respondents

Table 4-1: Questionnaire distribution and response

Name of respondents	Questionnaire distributed	Questionnaire responded	Response rate
Contractors	21	19	90.48
Consultants	12	11	91.67
Total	33	30	90.91

Based on the above table 4.1 the total number of questionnaire was distributed to randomly selected respondents were 33. Out of this questionnaire, 30 questionnaires were returned. The questionnaire sample was attached at appendix part.

4.2. Respondent profile

4.2.1. Educational background

Table 4-2: Educational background of organization

Level of education	Types of organization			
	Contractor	Percentage %	Consultant	Percentage %
Diploma and below	3	15.79%	-	-
Advanced diploma	3	15.79%	-	-
First degree	10	52.63%	4	36.36%
Second degree and above	3	15.79%	7	63.64%

As it has been described on the above table 4.2, most of the respondents to this study were first degree holders which are about 52.79%, about 15.79% were the holder of second degree and about 15.79% were advanced diploma and Diploma. This indicates that the major respondents educational back ground were first degree and above.

4.2.2. Experience of the respondents

Table 4-3: Experience of the respondents

year of experience	Number of responders			
	Contractor	Percentage (%)	Consultant	Percentage%
1-3	5	26.32	1	9.10
4-10	9	47.37	5	45.45
11-15	3	15.79	3	27.27
16-20	2	10.53	2	18.18

The work experiences of the respondents have a great role in getting accurate data for the research. Most of the respondents to this study have 4-10 years of experiences which was about 47.37% of total respondents. There were also about 26.32% professionals who have 1-3 years of experience especially from the consultant side as it has been observed from the lists of the respondents and about 15.79% and 10.53% professionals who have 11-15 and 16-20 years of experiences.

4.2.3. Position of Respondents

Table 4-4: Position of Respondents

No	Position	No of Respondent	Percentage (%)
1	Project Managers	4	13.33
2	Office Engineer	6	20
3	Site Engineer	8	26.67
4	Contract Administration	1	3.33
5	Resident Engineer	9	30
6	Surveyor	1	3.33
7	Forman	1	3.33
	Total	30	100

As we have seen above most of the respondents' position were site office engineer from contractors and resident engineer from consultants. Both professionals have a direct relation with workforce they can easily figure out the factor affecting

effectiveness HRPM systems. Fewer respondents were contract administrator, survey and Forman's.

4.3. Reliability checking- Cronbach's alpha

Cronbach's alpha was generally used as a measure of the reliability of a set of questions in a survey. This was because it combines the split-half method and item-total correlation and thus calculates the mean value of the reliability which can be obtained by the split-half method for all the data of the concept. According to (Linjesh et al., 2015) the value of Cronbach's alpha for acceptable reliability was 0.7. For this study all 52 variables with the rates given by 30 respondents were feed in to SPSS software then reliability analysis was carried out using Cronbach's alpha model. Cronbach's alpha was calculated using SPSS software and Cronbach's alpha values obtained is 0.718 which is greater than minimum required value of 0.7. These values show that all the factors are reliable and on need to exclude any of them.

Table 4-5: Cronbach's alpha for questionnaires reliability checking factors

		no of response	%	Cronbach's	no of items
Cases	Valid	30	100.0	0.718	52
	Excluded	0	0		
	Total	30	100.0		

4.4. Factors for effectiveness of HRPM systems of public building projects

The results of the study of factors affecting effectiveness HRPM systems in public building projects according to the respondent's point of views can be provided by an indication of the relative importance index and rank of factors affecting effectiveness of HRPM systems in public building projects in Adama town. Ranking of factors according to contractors and consultants view and each type of targeted group are shown in table 4.6 below.

Table 4-6: The relative importance index (RII) and the rank of factors

No	Factors affecting effectiveness of HRPM systems	Contractors		Consultants	
		RII	Rank	RII	Rank
	Management related factors				
1	Lack of planning and scheduling ability	0.836	1	0.829	2
2	Lack of construction skills of supervisors	0.827	2	0.835	1
3	Lack of communication ability of manager's	0.818	3	0.816	5
4	Inadequate instructions from supervisors	0.795	5	0.818	4
5	Lack of manager's coordinating skills	0.805	4	0.784	7
6	Communication between supervisors and construction workers	0.780	7	0.823	3
7	Inadequate instructions of site manager's	0.782	6	0.765	9
8	Poor coordination of workers by supervisors	0.764	11	0.757	11
9	Level of education of site manager's	0.777	8	0.758	10
10	Rework	0.750	10	0.806	6
11	Technical skills of management	0.773	9	0.767	8
12	Poor relationship of supervisors with workers	0.745	12	0.722	14
13	Lack of leadership skill of construction manager's	0.723	13	0.744	12
14	Lack of coordinate between team workers	0.718	14	0.723	13
	Sub-Contractors related factors				
15	communication problem between sub-contractors	0.732	3	0.719	4
16	coordination problems between main and sub-contractors	0.805	2	0.815	1
17	insufficient supervision of sub-contractors	0.727	4	0.736	3
18	relationship between workers of sub and main contractors	0.723	5	0.718	5
19	Lack of experience of sub-contractors	0.809	1	0.784	2

	Labor related factors				
20	Absenteeism of workers	0.709	7	0.733	5
21	Lack of moral and attitude of employee toward the works	0.705	8	0.709	8
22	Different addiction of labor such as alcoholism	0.645	10	0.670	9
23	Fatigue working overtime of labors	0.673	9	0.722	6
24	Labor turnover	0.718	6	0.744	3
25	Improper use of professional/ skills labors	0.764	3	0.855	1
26	Lack of labors skill	0.791	2	0.736	4
27	Labor operating system	0.723	5	0.718	7
28	Lack of training of labors	0.795	1	0.764	2
39	Coordination problem among workers	0.732	4	0.646	10
	worker motivation related factors				
40	Inadequate motivation of individual worker	0.641	7	0.622	7
41	Lack of promotion of workers	0.795	2	0.768	1
42	late payment of salaries and wages to employees	0.718	5	0.756	4
43	Inadequate bonus for workers	0.723	4	0.649	6
44	lack of training for labors	0.786	3	0.758	3
45	Poor relationship of laborers with superiors.	0.700	6	0.765	2
36	Unfair wages and salaries of construction workers	0.814	1	0.750	5
	Machinery Related Factors				
37	Insufficient number of machinery available	0.818	1	0.808	1
38	Inadequate skill of equipment operators	0.809	2	0.775	2
39	Damage to tools and machinery during operation	0.786	3	0.739	5
40	lack of maintenance of tools and equipment	0.782	4	0.769	3
41	Poor working condition of tools and machinery	0.777	5	0.765	4

	Material Related Factors				
42	Increase the cost of construction materials	0.755	3	0.768	3
43	Lack of adequate space for storage of materials	0.714	4	0.712	5
44	Late delivery of materials	0.818	1	0.790	1
45	Shortage of materials	0.782	2	0.769	2
46	Ineffective distribution of materials on site	0.695	5	0.725	4
	External related factors				
47	Sunlight effect on construction operation	0.705	1	0.715	1
48	Increases in cost of construction materials	0.691	2	0.705	2
59	Poor weather condition	0.641	3	0.635	4
50	Suspended in government policies and regulations	0.636	4	0.645	3
51	Effect of strikes on construction operations	0.600	5	0.612	5
52	Cultural and social related problems	0.564	6	0.555	6

4.4.1. Ranking of all factors affecting effectiveness of HRPM systems

There were total factors used for this study based on the literature review and observation from the experience of the researcher. Based on the respondents rating frequency the relative important indexes were calculated for each factors and ranked by SPSSv20. The results were shown in table 4.7.

Table 4-7: Ranked all factors affecting effectiveness of HRPM

No	All ranked factors affecting effectiveness of HRPM systems	All responses	
		RII	Rank
1	Lack of planning and scheduling ability of management	0.833	1
2	Lack of appropriate and formal training of supervisors	0.831	2
3	Financial inadequacy	0.817	3
4	Equipment shortage	0.813	4

5	Insufficient wages of construction labors	0.81	6
6	Inaccurate drawing	0.81	6
7	Late delivery of materials	0.807	7
8	lack of skills in design	0.804	8
9	Lack of experience of sub-contractors	0.802	9
10	Inadequate top management support	0.797	10
11	Lack of manager's coordinating skills	0.795	11
12	Inadequate skill of equipment operators	0.792	12
13	Lack of promotion of workers	0.782	14
14	Unfair wages and salaries of construction workers	0.782	14
15	Lack of training of labors	0.78	15
16	Rework due to unclear instruction from supervisors	0.778	16
17	lack of maintenance of tools and equipment	0.776	18
18	Shortage of materials	0.776	18
19	Inadequate instructions of site manager's	0.774	19
20	lack of training for labors	0.772	20
21	Poor working condition of tools and machinery	0.771	21
22	Technical skills of management	0.77	22
23	Level of education of site manager's	0.768	23
24	Lack of labors skill	0.764	24
25	Damage to tools and mach;8inery during operation	0.763	25
26	Increase the cost of construction materials	0.762	26
27	Poor coordination of workers by supervisors	0.761	27
28	late payment of salaries and wages to employees	0.737	28
29	Poor relationship of supervisors with workers	0.734	30
30	Lack of leadership skill of construction manager's	0.734	30

31	Poor relationship of laborers with superiors.	0.733	31
32	insufficient supervision of sub-contractors	0.732	32
33	Labor turnover	0.731	33
34	communication problem between sub-contractors	0.726	34
35	Lack of coordinate between team workers	0.721	37
36	relationship between workers of sub and main contractors	0.721	37
37	Absenteeism of workers	0.721	37
38	Labor operating system	0.721	37
39	Lack of adequate space for storage of materials	0.713	39
40	Ineffective distribution of materials on sit;2e	0.71	41
41	Sunlight effect on construction operation	0.71	41
42	Lack of moral and attitude of employee toward the work	0.707	42
43	Fatigue working overtime of labors	0.698	44
44	Increases in cost of construction materials	0.698	44
45	Coordination problem among workers	0.689	45
46	Inadequate bonus for workers	0.686	46
47	Different addiction of labor such as alcoholism	0.658	47
48	Hanged in government policies and regulations	0.641	48
49	Poor weather condition	0.638	49
50	Inadequate motivation of individual worker	0.632	50
51	Effect of strikes on construction operations	0.606	51
52	Cultural and social related problems	0.56	52

4.4.2. Test for agreement of effectiveness of HRPM factors

Correlation was a measure of linear relationship between two variables. It expresses the extent to which two variables vary together. The respondent of this research was contractor and consultant as a result it was required to know the correlation factor between the two parties on each factors. As shown on the following table both contractor and consultant have positive correlation on each factors which is equal to 0.817** as calculated by SPSS v20 using the RII value of each factors under both parties.

Table 4-8: Spearman importance rank correlations

Correlations				
			Contractor	Consultant
Spearman's rho	Contractor	Correlation Coefficient	1.000	.817**
		Sig. (2-tailed)	.	.000
		N	52	52
	Consultant	Correlation Coefficient	.817**	1.000
		Sig. (2-tailed)	.000	.
		N	52	52
**. Correlation is significant at the 0.01 level (2-tailed).				

4.4.3. Top ten significant factors affecting the effectiveness HRPM systems in public building project according to all categories

The effectiveness of HRPM problems in the public building project were prioritized in accordance with the most top-ten significant factors. The most significant factors of the effectiveness of HRPM systems in public building project in Adama Town according to the all categories were listed in Table 4.9.

According to all responses, the lack of planning and scheduling of management was the most important EHRPM factor as it has the first rank among all factors with RII = 0.833. This agreed that lack of adequate planning and scheduling management was affecting the effectiveness of HRPM systems because planning and scheduling are the

governing principles of all project stakeholders. Public building construction projects in the Adama Town are suffering from complex problems because of affects the stipulated cost and time in which the project should be delivered. These problems can be considered as a lack of adequate planning and scheduling management systems.

The lack of appropriate and formal training of supervisors was ranked in the 2nd position by the respondents with average values of 0.831. According to the respondents there was no appropriate and formal training of supervisors for their personnel. This follows that low productivity, rework in different work items, overrun in time and cost and workers can be exposed to various safety problems, i.e. injuries, accident and hazards. The interviews from contractors and consultants were in agreement with this ideology and also case studies were tried to emphasized due to lack of training was one of the factors that have caused the demolition of the structure and led to rework.

The financial inadequacy was ranked in the 3rd position by the respondents with the average values of 0.817. This shows that finance inadequacy was the factor affecting effectiveness of HRPM systems. Financial inadequacy for the organization influences the contractor's effectiveness by leading to performing ineffectively. The contractors are responsible for providing their personnel with adequacy finance to enhance their effectiveness in performing their work. This can be done through collaboration with financial institutions and even claiming for the periodic payment from the client on time without delay. The result of financial inadequacy was create dissatisfaction in doing work from the side of the worker, hinder the progress of the work and perform incorrectly, leads to deprived confidence of work, and this affects the effectiveness of HRPM systems in public building projects

Equipment shortage was ranked the 4th by the respondents with the average values of 0.813. This shows that shortage of equipment was the most factors affecting the effectiveness HRPM systems. Equipment shortage refers to unavailability of tools and equipment on construction site. The shortage of these item cause major idle time since employed labor are unable to progress their work as they need a minimum number of equipment to work effectively and due to material transportation problems and other related problems. If there are no enough tools and equipment on construction site then labors stop working which has direct impact on their productivity.

According to this study insufficient wages of construction labors was also ranked 5th among 52 factors affecting effectiveness of HRPM systems in building construction projects by the respondents with the average values of 0.810. This shows that it have very high impacts on effectiveness of HRPM systems. This reveals the fact that insufficient wages of construction labors have very high negative impacts on productivity of labors on construction projects. The quality of human performance was significantly dependent on motivation, where an increased motivation brings increased productivity and vice-versa. Therefore insufficient wages of construction labors was affecting the enhance job satisfaction of achievement, employer recognition, the work itself, taking responsibility and the chance to advance.

An inaccurate drawing was ranked in the 6th position with the average values of 0.807 by the respondents. This shows that inaccurate drawing was the most factor affecting effectiveness of HRPM systems. Therefore the drawing must be in the required standard and fulfill requirement. The Late delivery of materials was ranked in the 7th position with average values of 0.804. On building construction projects there are frequent late delivery of construction materials to site which causes stopping of work until it delivered to the site. As a result of this, HRPM were often idle waiting for materials and usually the HRP waste their time in unproductive work due to late delivery of materials. As the construction activities are interdependent, the late delivery of critical materials obstructs the work sequence and progress.

Lack of skills in design by consultant was ranked in the 8th position for all 52 factor affecting effectiveness of HRPM systems with the average values of 0.802. This factor was directly affects the contractors by distracting the project due to the wrong drawing provided by unskilled designer. Lack of experience of sub-contractors was ranked in the 9th position for all 52 factors affecting effectiveness of HRPM systems with the average values of 0.797. This shows that lack of skills in design the most factor affecting the effectiveness of HRPM systems in public building projects in Adama town. As general a contractor who hires sub-contractors, he doesn't really have any control over the sub-contractor's workforce. Therefore inexperienced of sub-contractors was the most important key factors influencing the effectiveness of HRPM systems in public building projects, it affects the stipulated cost, time delay, minimize the quality of work and cost in which project should be delivered.

Inadequate top management supports of contractors were ranked in the 10th positions among all 52 factors with the average values of 0.795. According to the contractors' view, top managements are not responsive on time for the problem happened due to poor supervision to work. As these most important key factors influencing the effectiveness of HRPM systems in public building projects, it affects the stipulated cost, time and quality in which project should be delivered.

Table 4-9: Top ten significant in all factors affecting effectiveness of HRPM

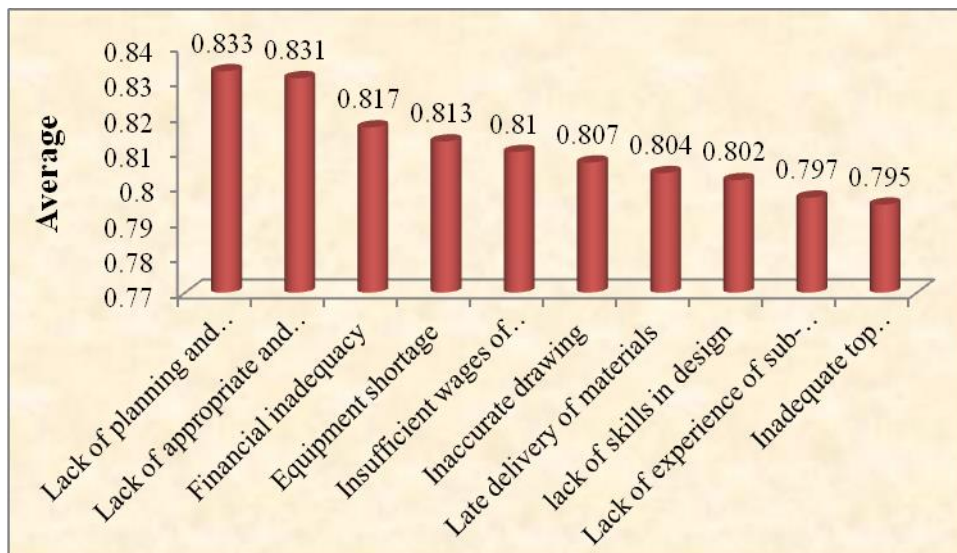| No	Top ten significant of all factors of effectiveness of HRPM systems in public building project	Average	Rank
1	Lack of planning and scheduling of management	0.833	1
2	Lack of appropriate and formal training of supervisors	0.831	2
3	Financial inadequacy	0.817	3
4	Equipment shortage	0.813	4
5	Insufficient wages of construction labors	0.81	5
6	Inaccurate drawing	0.807	6
7	Late delivery of materials	0.804	7
8	lack of skills in design	0.802	8
9	Lack of experience of sub-contractors	0.797	9
10	Inadequate top management support	0.795	10

Figure 4-1: Top ten significant from all factors

4.5. Ranking of factors affecting for each groups

4.5.1. Management related factors

Table 4-10: Management related factors according to respondents' viewpoint

No	Management Related Factors	Contractors		Consultants	
		RII	Rank	RII	Rank
1	Lack of planning and scheduling ability	0.836	1	0.829	2
2	Inappropriate training of supervisors	0.827	2	0.835	1
3	Financial inadequacy	0.818	3	0.816	5
4	Inaccurate drawing	0.795	5	0.818	4
5	Inadequate top management support	0.805	4	0.784	7
6	lack of skills in design	0.780	7	0.823	3
7	Inadequate instructions of site manager's	0.782	6	0.765	9
8	Poor coordination of workers by supervisors	0.764	11	0.757	11
9	Level of education of site manager's	0.777	8	0.758	10
10	Rework due to instruction from supervisors	0.750	10	0.806	6
11	Technical skills of management	0.773	9	0.767	8

12	Poor relationship of supervisors with workers	0.745	12	0.722	14
13	Lack of leadership skill of construction manager's	0.723	13	0.744	12
14	Lack of coordinate between team workers	0.718	14	0.723	13

Contractor view

The above Table 4.9 shows that the contractor's ranked inadequate planning and scheduling management to the contractors in the 1st position with and average values of 0.836. The contractors agreed that lack of adequate planning and scheduling management was affecting the effectiveness of HRPM systems. Planning and scheduling are the governing principles of all project stakeholders. The case study and interview result also support this result. As the most important key factors influencing the effectiveness of HRPM systems in public building projects, it affects the stipulated cost, time, and quality in which project should be delivered. The studies of Oluseyi Julius, (2014) are agreed with this result.

Contractors were ranked 2nd position by the lack of appropriate and formal training of supervisors (knowledge) of supervisors with RII values of 0.827. Unavailability of formal training for supervisors and other workers was one of the serious problems to contractors, to overcome the problems that arise due to poor workmanship. Lack of appropriate training has adversely affected the project on the side of contractors in terms of cost, quality, and time of completion. Additionally, the lack of training has numerous effects on safety, production, profit and overall execution of a project by affecting the effectiveness of HRPM systems in public building projects.

The contractors ranked financial inadequacy in the 3rd position with RII values of 0.818. This shows that finance is very important for saving foreseeable working condition and very important for supervision to move labors and staff members to overruns in time and makes them produce the desired product in all aspects of project constraint; financial inadequacy for the organization influences the contractor's effectiveness by leading to performing ineffectively. The contractors are responsible for providing their personnel with adequacy finance to enhance their effectiveness in performing their work. This can be done through collaboration with financial institutions and even claiming for the periodic payment from the client on time

without delay. The result of financial inadequacy was create dissatisfaction in doing work from the side of the worker, hinder the progress of the work and perform incorrectly, leads to deprived confidence of work, and this affects the effectiveness of HRPM systems in public building projects.

Contractors ranked inadequate top management support as the 4th factors that affecting the effectiveness of HRPM systems in public building projects within RII values of 0.805. According to the contractors' view, top managements are not responsive on time for the problem happened due to poor supervision to work.

Consultant view

Lack of appropriate and formal training of supervisors was ranked in the 1st position by consultants with RII values of 0.835. According to consultants, when contractors have no appropriate and formal training of supervisors for their personnel it is indisputable that the contractor's effectiveness in supervisors is under risky. This follows that low productivity, rework in different work items, overrun in time and cost and workers can be exposed to various safety problems, i.e. injuries, accident and hazards. The interviews from consultants were in agreement with this ideology and also case studies were tried to emphasized due to lack of training was one of the factors that have caused the demolition of the structure and led to rework.

The 2nd ranked factors from the side of the consultant was that lack of adequate planning and scheduling management with RII values of 0.829. The consultant agreed that lack of adequate planning and scheduling management that contractors prepare would affect the effectiveness of HRPM systems. The lack of skills in design was ranked in the 3rd position with RII values of 0.823. This factor was important for consultants because it directly affects contractors by distracting the project due to the wrong drawing provided by unskilled designer. According to the consultant, an inaccurate drawing was ranked in the 3rd position with RII values of 0.818. The drawing must be in the required standard and fulfill all requirements.

Generally, the RII values of management related factors affecting effectiveness of HRPM in public building construction projects in the Adama town are shown in figure 4-2 below
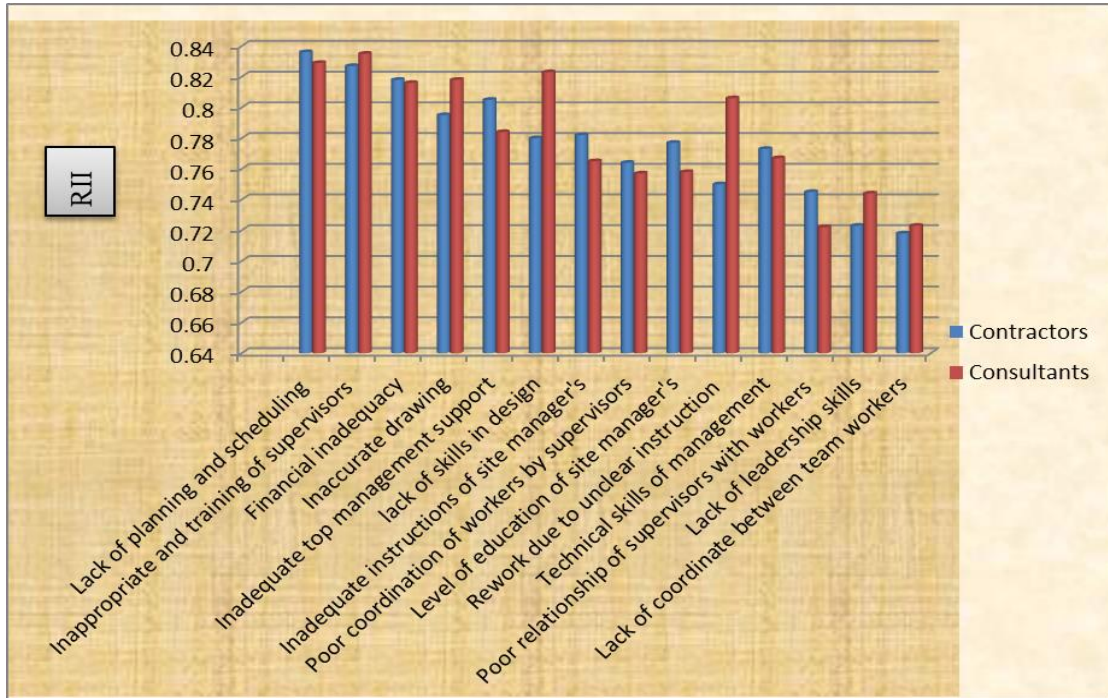
Figure 4-2: Management related factors

4.5.2. Labors Related Factors

Table 4-11: labor related factors

No	Labor related factors	Contractors		Consultants	
		RII	Rank	RII	Rank
1	Absenteeism of workers	0.709	7	0.733	5
2	Carelessness of construction labors	0.705	8	0.709	8
3	Different addiction of labor such as alcoholism	0.645	10	0.670	9
4	Fatigue working overtime of labors	0.673	9	0.722	6
5	Labor turnover	0.718	6	0.744	3
6	Insufficient wages of construction labors	0.764	3	0.855	1
7	Lack of labors skill	0.791	2	0.736	4
8	Labor operating system	0.723	5	0.718	7
9	Lack of training of labors	0.795	1	0.764	2
10	Coordination problem among workers	0.732	4	0.646	10

Contractor view

The above table shows that the contractor's ranked lack of training of labors was in the 1st position with the RII values of 0.795. The contractors agreed that lack of training of labors was affecting the effectiveness of HRPM systems in public building projects. According to the respondents; there was no appropriate and formal training of labors for by contractors. This problem was affects the stipulated cost, time and quality of work in which project should be delivered. Giving training for labors on building construction projects help them improve their experience and let them have high effectiveness.

Contractors were ranked 2nd position by the lack of labors skill with RII values of 0.791.According to the respondents; there were no professional skills of labors. This shows that lack of labors skill was one of the problems by the contractors. This follows that low productivity, rework in different work items, overrun in time and cost and workers can be exposed to various safety problems, i.e. injuries, accident and hazards. The study by Ade Abdulquadri et al., (2015) also supports that human resource should be trained to run the project along with the scheduled budget and duration.

Contractors were ranked 3rd position by insufficient wages of construction labors with RII values of 0.764. This shows that insufficient wages of construction labors was one of the serious problems by the contractors; to overcome the problems labors motivation because sufficient payment of salaries and wages was one of the factors under motivations. This reveals the fact that low salaries and wages of labor have very high negative impacts on productivity of labors on construction projects. Most of the labors in Adama comes from local areas of the region and they life totally depends on the salaries and wages they get. It was difficult for labors to live in the city with low wages and salaries because of accommodation problem and food problems which have direct impact on their effectiveness of HRPM systems. Therefore Insufficient wages of construction labors was affecting the enhance job satisfaction of achievement, employer recognition, the work itself, taking responsibility and the chance to advance.

Consultant view

According to the consultant side, insufficient wages of construction labors was ranked 1st position with RII values of 0.764. Lack of labor turnovers has been ranked by the consultant' respondents in the 2nd position with RII equal to 0.744. This factor was the most important one for consultant because availability competent labor turnovers to assist consultant to implement their projects with successful and suitable performance, and very important to consultant because it affects strongly on the effectiveness of HRPM systems. The above table shows that the consultant ranked 2nd by lack of training of labors position with the RII values of 0.764. The consultant agreed that lack of training of labors was affecting the effectiveness of HRPM systems in public building projects. According to the respondents; there was no appropriate and formal training of labors for by consultant. This problem was affects the stipulated cost, time and quality of work in which project should be delivered. Giving training for labors on building construction projects help them improve their experience and let them have high productivity.

Generally, the average of labor related factors of effectiveness of HRPM in public building construction projects in the Adama town are shown in figure 4.3 below.
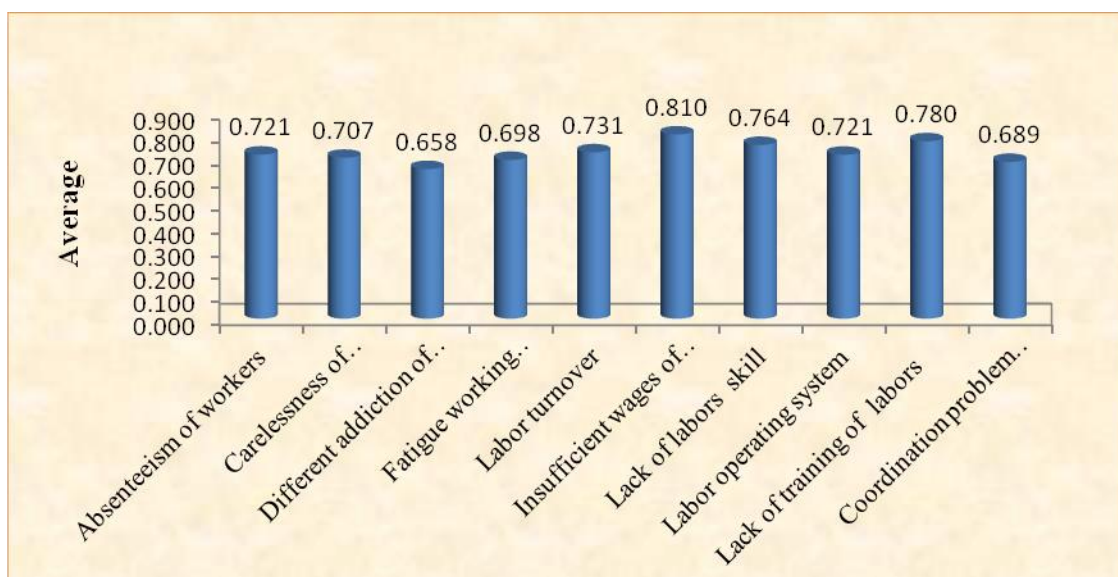

Figure 4-3: labor related factor

4.5.3. Machinery related factors

Table 4-12: Machinery related factors

No	Machine related factors	Contractors RII	Rank	Consultants RII	Rank
1	Equipment shortage	0.818	1	0.808	1
2	Inadequate skill of equipment operators	0.809	2	0.775	2
3	Damage to tools and machinery during operation	0.786	3	0.739	5
4	lack of maintenance of tools and equipment	0.782	4	0.769	3
5	Poor working condition of tools and machinery	0.777	5	0.765	4

Contractors view

Table 4.12 above shows that the contractor's ranked equipment shortage to contractors in the 1st position with the RII values of 0.818. The shortage of equipment like:- lack of vehicles, lack equipment for all machine intensive work items such as vibrators, excavators, compactors, loaders, cranes, etc. were the most important key factors influencing the effectiveness of HRPM systems in public building project because contractors can't continue to effectively by using manual intensive to execute construction work. Therefore it affects the stipulated time, quality, and costs.

Table 4.12: Shows inadequate skills of operators, which lead to slow operation, were the 2nd factors affecting the effectiveness of HRPM systems in public building project were ranked by the contractors with RII values of 0.689. Present day construction equipment operator skills were generally inadequate and as such, affect the operation of construction activities and not keeping quality in the desired way. These necessitate consistent operational training for construction operatives to prevent the negative impact of delays on construction projects.

Consultant view

Equipment shortage was ranked in the 1st by the consultants with RII value of 0.876. This shows that both client and contractors that have no enough equipment to mobilize materials, human resources, facilities, and logistics cannot be effective in HRPM systems.
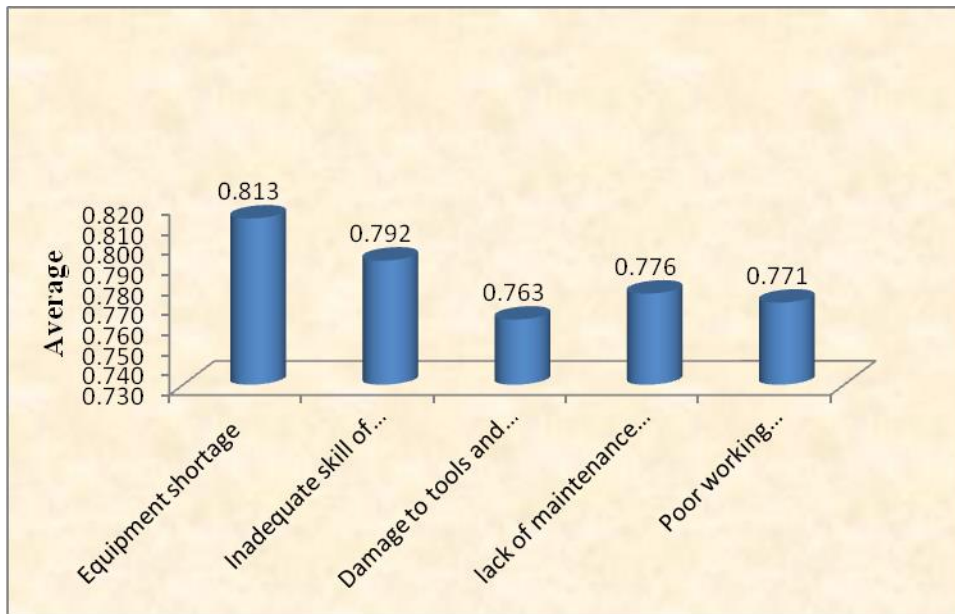
Figure 4-4: machine related factors

4.5.4. Workers Motivation Related Factors

Table 4-13: Rank and RII values of motivation related Factors

	worker motivation related factors	Contractors		Consultants	
No		RII	Rank	RII	Rank
1	Inadequate motivation of individual worker	0.641	7	0.622	7
2	insufficient wages of construction labors	0.795	2	0.768	1
3	late payment of salaries and wages to employees	0.718	5	0.756	4
4	Inadequate bonus for workers	0.723	4	0.649	6
5	lack of training for labors	0.786	3	0.758	3
6	Poor relationship of laborers and superiors.	0.700	6	0.765	2
7	Lack of promotion of workers	0.814	1	0.750	5

Contractors view

The 1st ranked factor from the side of the contractors was lack of promotion of workers with the RII values of 0.814. promotion of workers good commitment that worker mobilizing, encouraging, and motivation toward achieving effectiveness of HRPM systems through different incentives, benefits, bonuses, etc. are very important

for their commitment to drive them to a good position. Lack of promotion of workers for the contractors, in turn, endangers the effectiveness of HRPM systems in public building construction. The contractor was responsible for his new and existing staff members to providing them with an award to encourage them.

The 2nd ranked factors from the side of contractors was insufficient wages of construction labors with the RII values of 0.795. This factor was significant for the contractors because it affects the effectiveness of HRPM systems in building construction projects. Therefore Insufficient wages of construction labors was affecting the enhance job satisfaction of achievement, employer recognition, the work itself, taking responsibility and the chance to advance.

Contractors were ranked 3rd position by lack of appropriate training of labors with RII values of 0.786. According to the respondents there was no appropriate and formal training of labors by contractors. Based on this result; poor workmanship was affects the effectiveness of HRPM systems in public building projects. This follows that low productivity, rework in different work items, overrun in time and cost and workers can be exposed to various safety problems, i.e. injuries, accident and hazards. The interviews from contractors and consultants were in agreement with this ideology and also case studies were tried to emphasize due to lack of training that have caused the demolition of the structure and led to rework.

Consultant view

The 1st ranked factors from the side of consultant's respondent was insufficient wages of construction labors with the RII values of 0.768. The consultant was agreed that he supervise and consults the wages or payment that the contractors paid to labors. Therefore Insufficient wages of construction labors was affecting the enhance job satisfaction of achievement, employer recognition, the work itself, taking responsibility and the chance to advance.

The 2nd ranked factors from the side consultant's respondent was poor relationship of laborers and superiors with the RII values of 0.768. According to respondents; there was no relationship between labors and consultants. This shows that low motivation and communication of labors by supervisors. Therefore poor relationship of laborers

and superiors result was claim, dispute, low communication and affecting the enhance job satisfaction of achievement.

Consultants were ranked 3rd position by lack of appropriate training of labors with the RII values of 0.758. According to the respondents there was no appropriate and formal training of labors by consultant. Based on this result; poor workmanship was affects the effectiveness of HRPM systems in public building projects. This follows that low productivity, rework in different work items, overrun in time and cost and workers can be exposed to various safety problems, i.e. injuries, accident and hazards.

Figure 4-5: worker motivation related factors
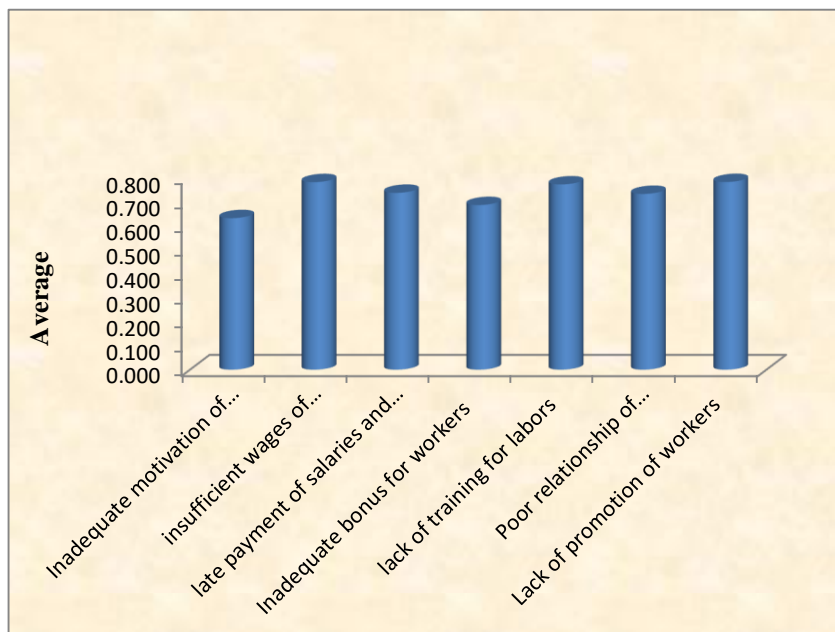
4.5.5. Construction Material Related Factors

Table 4-14: Rank and RII values of material related factors

No	Construction material related factors	Contractors		Consultants	
		RII	Rank	RII	Rank
1	Shortage of materials	0.755	3	0.768	3
2	Lack of adequate space for storage of materials	0.714	4	0.712	5

3	Late delivery of materials	0.818	1	0.790	1
4	Increase the cost of materials	0.782	2	0.769	2
5	Ineffective distribution of materials on site	0.695	5	0.725	4

Contractors view

Contractors were ranked 1st position by late delivery of materials with RII values of 0.818. On building construction projects there are frequent late delivery of construction materials to site which causes stopping of work until it delivered to the site. Increase the cost of materials has been ranked by the contractors' respondents in the 2^{dn} position with RII equal to 0.782. This factor was the most important one for contractors because of the continuous closures of a public building in the Adama town to a rapid shortage of construction materials and increase/escalation of construction material prices. This escalation of material prices affects the liquidity of contractors and the profit rate of their projects.

Shortage of construction material was ranked by the contractors' respondents in the 3rd position with RII equal to 0.755. This factor was significant for the contractors because it affects the time effectiveness of HRPM systems in public building construction project such as delay due to the shortages of construction materials.

Consultant view

Consultant was ranked 1st position by late delivery of materials with RII values of 0.790. Material delivery was one of the components of the project budget affecting the effecting the effectiveness of HRPM systems. On building construction projects there are frequent late delivery of construction materials to site which causes stopping of work until it delivered to the site. The increase cost construction material prices was ranked by the consultants' respondents in the 2nd position with RII equal to 0.769. Escalation of construction material prices affects the effectiveness of HRPM systems because this escalation of material prices affects the liquidity of consultant and the profit rate of their projects.

The 3rd ranked factor from the side of the consultant was that shortage materials with the RII values of 0.768. The consultants agreed that shortage of materials management that contractors prepare would affects the effectiveness of HRPM

systems. Material management was the governing principles of all project stakeholders.
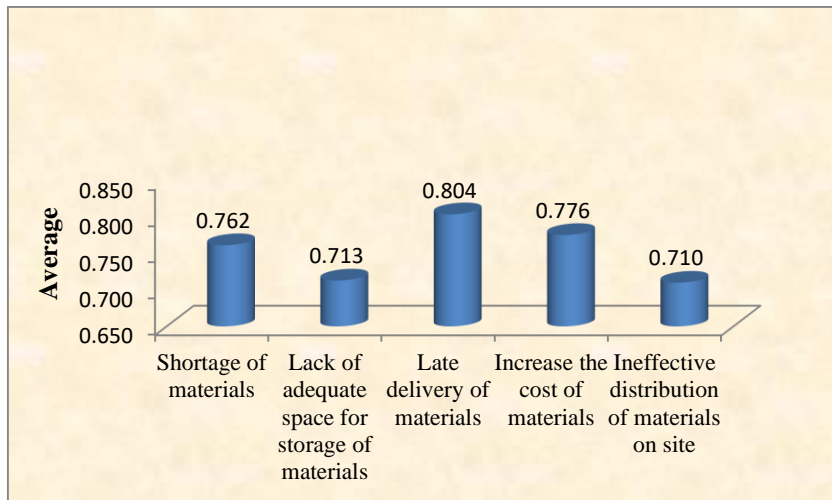
Figure 4-6: Construction material related factors

4.5.6. Sub-Contractors Related Factors

Table 4-15: Rank and RII values of sub-contracting related factors

No	*Sub-Contractors related factors*	Contractors		Consultants	
		RII	Rank	RII	Rank
1	Communication problem between sub-contractors	0.732	3	0.719	4
2	Coordination problems of main and sub-contractors	0.805	2	0.815	1
3	Insufficient supervision of sub-contractors	0.727	4	0.736	3
4	Relationship workers of sub and main contractors	0.723	5	0.718	5
5	Lack of experience of sub-contractors	0.809	1	0.784	2

Contractors view

The coordination problems of main and sub-contractors was ranked 1st with the average values of 0.810. To increase effectiveness of HRPM systems that, the

management of main and sub-contractors plays a great role to the effectiveness of HRPM and greatest challenge on the performance of HRPM systems. Lack of experience of sub-contractors was ranked 2nd on sub-contractors related factor groups with the average values of 0.897. Insufficient supervision of sub-contractors, communication problems between sub-contractors and relationship between workers of sub-contractors were ranked 3rd, 4th, and 5th with the average values of 0.732, 0.726 and 0.722 respectively.
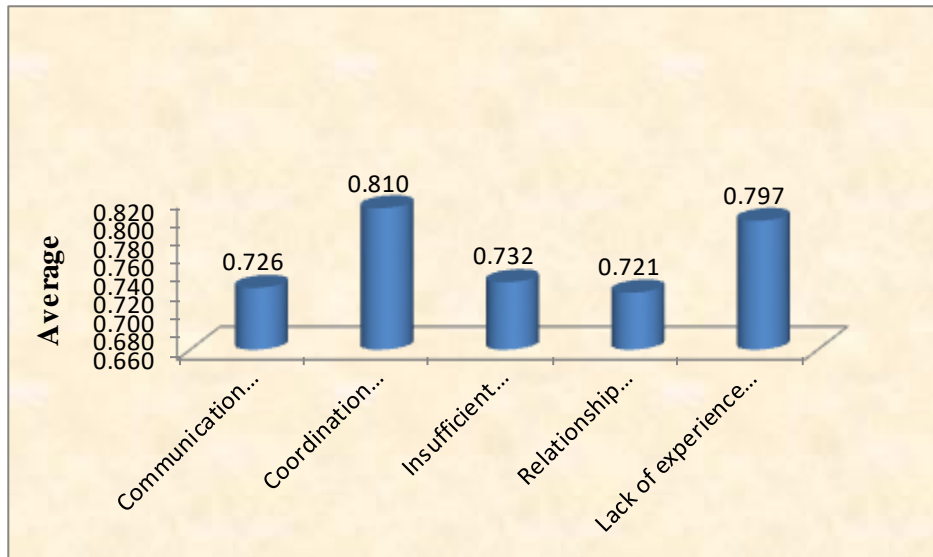
Figure 4-7: sub-contractors related factors

4.5.7. External Related Factors

Table 4-16: external related factors

No	Project characteristics and environmental related factors	Contractors		Consultants	
		RII	Rank	RII	Rank
47	Unfavorable working conditions	0.705	1	0.715	1
48	Location of the project	0.691	2	0.705	2
49	Harsh weather condition	0.641	3	0.635	4
50	Complexity of the project	0.636	4	0.645	3
51	Increases in cost of construction materials	0.600	5	0.612	5
52	Cultural and social related problems	0.564	6	0.555	6

Contractor view

Table 4.16: shows unfavorable working condition was ranked in the 1st position with RII values of 0.705. According to contractor working conditions was an unfavorable due to climatic condition, political situation, conflict among nations, awareness of the local community toward the importance of the project and stability of the people around the project environment.

An important factor that contractors have ranked in the 2nd position was location of the project with RII values of 0.691. According to the contractors' view location of the project has a significant impact on the effectiveness of HRPM systems in public building project. This factor was the most important one for contractors because the price escalation of construction materials, high wage of labors, lack of transportation, water etc. with affect effective qualification of contractors to implement their projects with successful and suitable condition.

Table 4.16 shows harsh weather condition was ranked as the 3rd major factor by contractors with an RII of .0.641. Contractors explained that some public building construction site locations were found in harsh weather conditions which were very difficult and unpleasant to live in them and they have a significant impact on their effectiveness of HRPM systems. Study Nicholas Chileshe et al., (2015), agree with these climatic conditions on site affect effectiveness of HRPM systems and weathering conditions are significant factors to consider for completion of any construction projects.

The 4th ranked factor by the contractors was the complexity of the project with 0.636. The more complex project was more complex management and need highly educated professionals at all construction project phases. This needs advanced scheduling method, planning tools, construction methods and equipment to enhance the effectiveness of HRPM systems.

Consultant view:

Table 4.16 shows unfavorable working conditions were the 1st factors affecting the effectiveness of HRPM systems in public building project were ranked by the consultant with RII values of 0.715. According to consultant' view unfavorable working conditions due to political situation, site location which has no infrastructure i.e. high rents living shelter, material quality and qualified workmanship. An important factor that consultants have ranked in the 2nd position was location of the project with RII values of 0.705. According to the consultants' view location of the project has a significant impact on the effectiveness of HRPM systems in public building project. This factor was the most important one for contractors because of price escalation of construction materials, high wage of labors, lack of transportation, water high rents of living shelter etc. with affect effective qualification contractors to implement their projects with successful and suitable condition.

The 3rd ranked factor by the consultants was the complexity of the project with 0.645. The more complex project was more complex management and need highly educated professionals at all construction project phases. This needs advanced scheduling method, planning tools, construction methods and equipment to enhance the effectiveness of HRPM systems. The interview and case study analysis also supports this idea strongly.
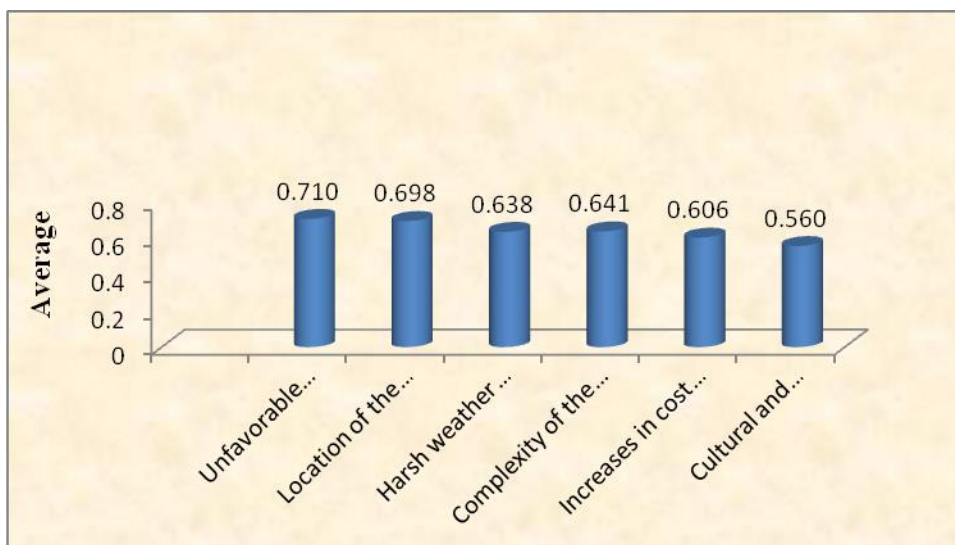

Figure 4-8: external factors

4.6. The impact of factors affecting effectiveness of HRPM

Table 4-17: impacts of factor affecting effectiveness of HRPM

No	Impacts of factor affecting effectiveness of HRPM system	Contractor		Consultant	
		RII	Rank	RII	Rank
1	Low productivity by employees	0.652	9	0.660	5
2	Overruns in time and cost	0.743	1	0.800	1
3	Disputes and Employee conflicts	0.721	4	0.532	12
4	Rework	0.740	2	0.741	2
5	Project elongation/delay	0.721	6	0.640	7
6	Material waste	0.730	3	0.740	3
7	Inadequate quality	0.720	7	0.690	4
8	Variations	0.710	8	0.710	3
9	Client's dissatisfaction	0.650	10	0.631	8
10	Lack of accountability	0.612	11	0.610	11
11	Crime and theft of funds and goods in an organization	0.723	5	0.641	6
12	Experience low quality of finished job	0.610	12	0.620	9

Contractors view

Contractors ranked overruns in time and cost in the 1st position with the RII values of 0.743. From the contractor's point of view, most of their projects were underexposure of cost and time overrun due to that there was no effective HRPM system by contractors at the right time to solve the problems associated with shortage of machine, unsuitable site condition, and access to site. On the other hand, an important reason was material delivery on time to commence into the general execution of work from the contractors. The interview and case study conducted were supported the result above. Therefore, this needs time to solve all these situations and the contractor work schedule disturbed in this case and the faulty design would mostly affect contractor effectiveness in building construction.

Rework due to low quality of the finished job was ranked in the 2nd position with the RII vales of 0.740 by the contractor. Lack of effective HRPM system brings about the undesired end product especially when poor workmanship, untrained workers, the wrong procedure of work execution, etc. are left to uncorrected by responsible supervisors.

Material wastage was ranked in the third position with RII of 0.730 by the contractor. These show that the impacts of lack of supervision from the side of the contractor resulted in material wastage due to rework: when the incorrect accomplishment of the work item was performed, preparation of wrongly material size by faulty design, poor workmanship, unclear drawing, and interpretation error.

Consultant view

The consultant ranked overruns in time and cost in the 1st position with the RII of 0.800. From the consultant point of view most of their projects were under exposure of cost and time overrun due to that there was no effective supervision by them at the right time to solve the problems associated with faulty design, unsuitable site condition, access to site, delay of advanced payment, ineffective infrastructure, and delay of site hand over from client. Therefore, this needs time to solve all these situations and the contractor work schedule disturbed in this case and the faulty design would mostly affect contractor effectiveness of HRPM systems in public building construction project.

Table 4.17 Shows material wastage was the 2nd impact of effectiveness of HRPM factors in public building construction ranked by the consultant with an RII of 0.740. According to consultants' view material waste, arises from the design change, faulty design, rework when the incorrect accomplishment of the work item is performed, and preparation of wrongly material size by faulty design, poor workmanship, unclear drawing, and interpretation error. The finding of the case study also supports this result which material waste was a big stoppage for contractor effectiveness because of rework when the incorrect accomplishment of the work item was performed and preparation of wrongly material size by fault design.

Rework due to low quality of the finished job was ranked in the 3rd position with RII of 0.740 by consultant. Lack of effective HRPM systems brings about the undesired

end product especially when poor workmanship, untrained workers, the wrong procedure of work execution, etc. are left to uncorrected by responsible supervisors. The interview from different respondents frequently showed that the end product below standard sated on the specification was one of the impacts of effectiveness HRPM systems. The case study also agrees with this idea. The Rank of overall weights of RII values of impacts of effectiveness of HRPM systems in public building construction according to all respondents' view shows below figure 4.9
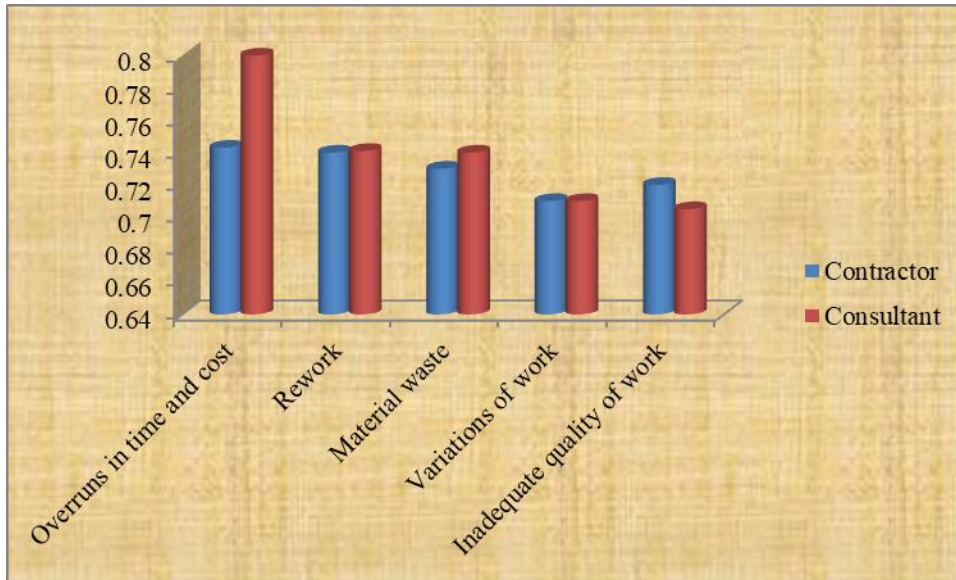

Figure 4-9: Top Five Impacts of factor affecting effectiveness of HRPM

Figure 4.9 above shows the top five rank of in an overall weighted RII values of impacts which affecting effectiveness HRPM systems in public building construction project according to all respondents' views that have been investigated in this research from contractor and consultant viewpoints. All the respondents (contractors and consultants) were ranked overruns in time and cost of project in the first position with the RII values of 0.74. In this regard, the respondents added their view for improving the effectiveness of HRPM systems ongoing work and this will helps them for good following up of the progress of projects, for the correct distribution of works, for the commitment of employees at the site, for good monitoring of the project. According to the respondents, if the contractor has effective leadership skills, the project supervision can be monitored, controlled and managed with high quality. Therefore, if all parts discharge their responsibility, the project can goes along with its estimated cost and scheduled time.

The second thing that all respondents were picked was rework due to low quality of finished job which was ranked in the second position with the RII values of 0.74. according to all stakeholders, it was obvious that lack of effectiveness of HRPM systems brings about the undesired end product especially when poor workmanship, untrained workers, wrong procedure of work execution, etc. are left to uncorrected by responsible supervisors.

Material wastage was ranked in the third position with the RII values of 0.73, variation of work due to poor supervision, poor workmanship and poor design was ranked in the 4th and inadequate quality of work was ranked 5th by the RII values of 0.710 and 0.705 respectively by all respondents. These show that the impacts of HRPM systems from the side of the contractor resulted in material wastage due to rework: when the incorrect accomplishment of the work item was performed, preparation of wrongly material size by faulty design, poor workmanship, unclear drawing, and interpretation error.

4.7. Interview

4.7.1. Analysis of Interview

The interview was made from randomly selected professionals from supervisors, contractors, consultants and others who are actively participating in building construction projects were conducted. The interview had three different questions from each party.**1.** From your experience, what are the factors affecting the effectiveness of HRPM systems in public building construction projects in the Adama town? **2.** What are the impacts of the lack of effective HRPM systems in your project? **3.** What do you suggest to improve the problems encountered due to the lack of effective HRPM systems in public building construction projects.

Table 4-18: Interview analysis

Question	Contractor's Response	Consultant's Response
From your experience what are the factors affecting effectiveness of HRPM in public building construction	• Lack of close supervision • Logistics and transport problems • Corruption	• Lack of response • Lack of confidence • Poor communication

projects in Adama town?	• Lack of effective management • Lack of transparence • Lack of awareness in employment side	• Design error • Skill of supervisor • Top management • Poor workmanship • Experience of supervisor
What are the impacts of lack of effective HRPM systems in your project?	• Variation • Under standard of material and construction method • Increase safety problems on site • Inadequate quality • Lack of accountability • Employee conflicts • Crime and theft of funds and goods in an organization	• Wastage of material • Demolition of structure /Rework • Affect quality of project • Cos overrun and delay • Experience low quality of finished job • Project elongation
What do you suggest to improve the problems encountered due to lack of effective HRPM systems in public building construction projects?	• Awareness should be give • Periodical supervision • Make close supervision • Give attention to precondition of project • Attend daily progress report • Fight against corruption	• Enhancing the knowledge of supervisor through train and education. • Inspiring supervisors to make them honesty, accountable, responsible, confident, etc.

The interview indicated that (14) factors affecting effectiveness HRPM systems of in public building construction projects were identified, (13) impacts of lack of effectiveness of HRPM systems in public building projects and (8) suggestion to improve the problems encountered due to lack of effectiveness of HRPM systems in public building construction projects.

According to the result from the interview, lack of close supervision, logistics and transport problems, corruption, lack of effective management, lack of transparency, lack of response, lack of confidence, poor communication, design error, skill of supervisor, top management support, poor workmanship, experience of supervisor needed, and complete drawing should be submitted were identified as factors affecting effectiveness HRPM systems in public building construction projects.

Increase safety problems on-site, variation under the standard of material and construction method, wastage of material, demolition of structure/rework, affect the quality of the project, cost overrun and delay the result of the impacts of lack of effective supervision.

From the result of the interview; the suggestions given to improve problems encountered due to lack of effective HRPM systems in public building construction projects were: awareness should be given, periodical supervision, make close supervision, give attention to precondition of project, attend daily progress report and fight against corruption.

4.8. Case Study

Table 4-19: Case study analysis

Projects	Project 1	Project 2
Project location	Adama town	Adama town
Contractor	X	Y
Consultant	A	B
Project title name	Adama university graduation hall	Adama administration of Bole sub-city office
Delivery system	DBB	DBB
Contract amount	ETB 500,056,410.45	ETB 10,573,560.75
Reread contract amount	ETB 523,194,007.2	ETB 10,612,525.57
Variations cost	ETB 23,137,596.75	ETB 389,649.82
Beginning date	January 05,2014	March 5,2010

End date	January 11,2018	March 15,2019
Contract period	803 calendar days	264 calendar days
Extension of time	268 calendar days	132 calendar days
Project status	80%	85%

Project 1	
Factor affecting effectiveness of HRPM systems	*Impacts of effective HRPM systems factors*
Equipment shortage	Time overrun, Cost overrun, Conflicts of stakeholders
Change of finishing material	
Inefficiency of equipment's	
Inaccurate drawing	Demolition /Rework, Inadequate quality of works and Variation of work
Lack of experience of sub-contractors	
Project 2	
Shortage of equipment	Time overrun, Cost overrun and Dis satisfaction of client
Change of finishing material	

The case studies was conducted, and discussed about the impacts of effectiveness of HRPM factors on the public building construction projects in Adama town. There are ten ongoing public building construction projects in Adama town, from which two case studies have made conducted from the consultant offices.

The findings of case study conducted discovered that the impacts on effectiveness of HRPM factors on public building project in Adama town were time overrun, cost overrun, and rework. Time overrun on the public building construction project was due to an equipment shortage, change of finishing material, and inefficiency of equipment's. In the case study made with Adama university graduation hall construction project, there are about 268 calendar days of extension time, and the projects' status has been 80 percent and the case study made with Adama administration of Bole sub-city office, there are about 132 calendar days of extension

time, and the project status has been 85 percent, and those projects are not finished until today. Therefore, time overrun resulted on public building construction project.

Cost overrun on the public building construction project has resulted due to an equipment shortage, Change of finishing materials, inefficiency of equipment's and additional works of construction project in the Adama town. In the case study of Adama university graduation hall construction project, about 23,137,596.75ETB variations cost amount to be added to the contract amount and the case study of Adama administration of Bole sub-city office construction project, 389,649.82ETB variations cost amount are added to the contract amount, and those projects are not finished until today. Therefore, cost overrun also occurred on public building construction project.

Rework due to inaccurate drawing and lack of experience of sub-contractors in Adama university graduation hall and Adama administration of Bole sub-city office construction project were occurred. Therefore, time overrun, cost overrun, and rework was determined as the impacts of effectiveness of HRPM systems on public building project in the Adama town.

5. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The conclusions of the research were established in the context of the three main objectives of the study. All responses are agreed for all mentioned factors which affecting the effectiveness of HRPM systems in public building construction project in Adama town. The significant value of Spearman's rho correlation coefficients are all the results of the test agreement between the parties was a positive correlation. The reliability of data was checked by using Cronbach's alpha, the internal consistency of EHRPM factors in the research was high-reliability consistency. This reliability data of the research was analyzed by using SPSS v20.

From the survey conducted and analysis, it was 52 factors affecting effectiveness of HRPM systems were identified from the response questionnaire. From the identified factors were lack of planning and scheduling ability of management, lack of appropriate and formal training of supervisors, financial inadequacy, equipment shortage, inefficiency of equipment, inaccurate drawing, late delivery of materials, lack of skills in design, lack of experience of sub-contractors and inadequate top management support were the most top ten significant factors which affecting the EHRPM systems in public building projects in Adama town.

The impacts on EHRPM factors in public building project were identified based on the results from twelve impacts by means of excel and SPSS Vs20 and ranked on their RII values and overruns in time and cost, rework due to inaccurate drawing and lack of experience of sub-contractors, variation of work and inadequate quality of works were the most significant impacts on public building projects in Adama Town.

According to the interviews, and the case studies, time overrun, cost overrun, and rework due to inaccurate drawing and lack of experience of sub-contractors were the most three significant impacts of effectiveness HRPM systems on public building construction projects in Adama Town are.

5.2. Recommendation

Contractors should consider the following:

➢ The contractors are recommended to improve their effectiveness of HRPM systems there should be proper planning and scheduling of works and human resources. Since a well prepared plan and schedule is instrumental in formulating directions, setting in sequential order, various operations, coordinating functions, setting targets, forecasting resources, budgeting costs, controlling performance and motivating people.

➢ The contractors are recommended it should give special training to their workers on building construction activities to improve their skills of work and to enhance their experience which help effective HRPM systems on building construction projects to avoid reworks on each activity by carefully supervising workers during work.

➢ The contractors are recommended to improve their effectiveness of HRPM systems there should be financial adequacy for leading to performing in all as aspects of project constraint and they are responsible for providing their personnel with adequate finance to enhance their effectiveness in performing their work.

➢ Contractors are recommended; to improving the effectiveness of HRPM systems there should   be available to adequacy and efficiency of construction equipment and delivery construction materials are properly scheduled and it should be timely delivered because the effectiveness of HRPM systems is dependent on construction equipment and construction materials.

➢ Contractors are recommended to adequate and regular pre-construction and construction reviews of architect and structural engineer production information documents will help to prevent missing information, improve inaccurate of drawings and communicate sub-contractors prevent any rework, improve build ability and ultimately enhance the effectiveness of HRPM systems.

Consultants should consider the following:

➢ The consultants must follow up on the construction site at all construction phases and able to deliver the project of desired end product at the right time, cost and quality for a client by improving the effectiveness of HRPM systems.

➢ The consultant must give up formal training, decision making, effective communication, management support in order to improve the effectiveness of HRPM systems.

➢ The consultant is recommended to request everything they need in the contract from the beginning and avoid any requirements after the implementation of works and develop a clear vision for projects.

➢ The consultants are recommended to the clear and accurate the drawing of the project according to the request from the client so that the contractor must get variation (cost and time) for rework which happens from inaccurate drawing.

➢ The consultants should have good knowledge or skills in design and project drawing according to the request from the client to achieve the organization objectives.

➢ The consultant is recommended to closest the workforce, that is, to where the work is performed by skilled construction craft workers for improving the effectiveness of HRPM systems.

➢ The consultants are recommended to search and explore the equipment that is available in the country for improving the effective HRPM systems.

➢ The consultant is recommended to effective information and adequate record-keeping of stock and frequent check of available materials on site will enable procurement officers to make early orders and follow up on materials delivery for improve the effectiveness of HRPM systems.

➢ The consultant recommended to improving the capacity and effectiveness of HRPM system so as to ensure efficient, transparent and effective implementation and management systems.

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APENDDIX

Jimma University

School of Graduate Studies

Jimma Institute of Technology

Faculty of Civil and Environmental Engineering

Construction Engineering and Management Stream

Dear respondent

Thank you very much for your willingness to take time to respond to this research questionnaire. The study is being conducted by a postgraduate student at Jimma Institute of Technology University, Faculty of Civil and Environmental Engineering, Department of Construction Engineering and Management and Degree of Master's in Construction Engineering Management. It is all about questions pertaining to factors affecting Effectiveness of HRPM systems in public building projects in Adama town.

The participation is fully on voluntary basis and your accurate and frank responses are imperative for the successful accomplishment of the study.

Please be assured that your responses will be treated in a strictly confidential manner and the result will be used only for the purpose of this research, presented only at aggregate level without focusing on individual company.

Kindly, therefore, please return the questionnaire up on completing each item appropriately.

Thank you in advance   Name: Abdissa Garadew

 Respectfully!   Phone: 0922214881 or 0913281914

                                                 Email: abdissagaradew@gmail.com

APENDEX A: **Questionnaire survey**

Title of Research Study: The Factors Affecting Effectiveness of Human Resource Planning and Management Systems in public building project in Adama Town. Indicate your answer to each question by filling in the space provided or by ticking (√) in the correct answer as appropriate.

Part 1: General Information of company and personnel.

What is your Organization status in the firm?

Contractor ☐   consultant ☐   Employer ☐   other_____

Educational Background

MSc. ☐   BSc. ☐   Diploma ☐Advanced diploma ☐ other _____

Tota work Experience_____Years

Current Position:

Project manager ☐   Office Engineer ☐ Site Engineer ☐

Resident Engineer ☐   Surveyor ☐   Forman ☐   Other_____

Part 2: Factors Affecting Effectiveness of Human Resource Planning and Management Systems Public in Building Construction Projects

Please try to fill the questionnaires provided below based on the level of impact they have affecting the Effectiveness of human resource planning and management systems in your company by making (√) in the space provided. (**5** = Very High Impacts; **4** = High Impacts; **3** = Medium Impacts; **2** = Low Impacts; and **1** = Very Low Impacts).

Factors affecting effectiveness of HRPM systems		level of impact				
No	*a. Management related factors*	5	4	3	2	1
1	Lack of planning and scheduling ability of management					
2	Lack of appropriate and formal training of supervisors					
3	Financial inadequacy					
4	Inaccurate drawing					
5	Inadequate top management support					

		5	4	3	2	1
6	lack of skills in design					
7	Inadequate instructions of site manager's					
8	Poor coordination of workers by supervisors					
9	Level of education of site manager's					
10	Rework due to unclear instruction from supervisors					
11	Technical skills of management					
12	Poor relationship of supervisors with workers					
13	Lack of leadership skill of construction manager's					
14	Lack of coordinate between team workers					
	b. Sub-Contractors related factors	**5**	**4**	**3**	**2**	**1**
1	Communication problem between sub-contractors					
2	Coordination problems of main and sub-contractors					
3	Insufficient supervision of sub-contractors					
4	Relationship b/n workers of sub and main contractors					
5	Lack of experience of sub-contractors					
	c. Labor related factors	**5**	**4**	**3**	**2**	**1**
1	Absenteeism of workers					
2	Carelessness of construction labors					
3	Different addiction of labor such as alcoholism					
4	Fatigue working overtime of labors					
5	Labor turnover					
6	Insufficient wages of construction labors					
7	Lack of labors skill					
8	Labor operating system					
9	Lack of training of labors					
10	Coordination problem among workers					

	d. worker motivation related factors	5	4	3	2	1
1	Inadequate motivation of individual worker					
2	Lack of promotion of workers					
3	late payment of salaries and wages to employees					
4	Inadequate bonus for workers					
5	lack of training for labors					
6	Poor relationship of laborers and superiors.					
7	Lack of promotion of workers					
	e. Machinery Related Factors	5	4	3	2	1
1	Equipment shortage					
2	Inadequate skill of equipment operators					
3	Damage to tools and machinery during operation					
4	lack of maintenance of tools and equipment					
5	Poor working condition of tools and machinery					
	f. Material Related Factors	5	4	3	2	1
1	Shortage of materials					
2	Lack of adequate space for storage of materials					
3	Late delivery of materials					
4	Increase the cost of materials					
5	Ineffective distribution of materials on site					
	g. External related factors	5	4	3	2	1
1	Unfavorable working conditions					
2	Location of the project					
3	Harsh weather condition					
4	Complexity of the project					
5	Increases in cost of construction materials					

6	Cultural and social related problems					

Part 3: Impact of lack of effective of HRPM systems in public building construction projects in Adama Town

Please indicate to what extent of the following impacts due to lack of effective HRPM systems in public building construction project by ticking (**X or √**) in the column representing in your selection.

1. Rate of impacts

Respondents were asked to rank impacts of lack of effective HRPM systems according to the degree of importance (**5** = Very High Impacts; **4** = High Impacts; **3** = Medium Impacts; **2** = Low Impacts; and **1** = Very Low Impacts)

No	Impacts of factor affecting effectiveness of HRPM system	level of impact				
		5	4	3	2	1
1	Low productivity by employees					
2	Overruns in time and cost					
3	Disputes and Employee conflicts					
4	Experience low quality of finished job					
5	Project elongation/delay					
6	Material waste					
7	Inadequate quality					
8	Variations					
9	Client's dissatisfaction					
10	Lack of accountability					
11	Crime and embezzlement of funds and goods in an organization					
12	Rework due to inaccurate drawing and lack of experience of sub-contractors					

Appendix B. Interview

Interviews Questions

From your experience, what are the factors affecting effectiveness of HRPM systems in public building construction projects in Adama Town?

_____
_____
_____
_____

What are the impacts of lack of effective HRPM systems in your project?

_____
_____
_____
_____
_____

What do you suggest to improve the problems encountered due to lack of effective HRPM systems in public building construction projects?

_____
_____
_____
_____

Appendix C. Case Studies

Case study on stakeholder's

Contractor side ☐

Consultant side ☐

General information about problems

project number	*types*	*Location*	*problems*	*measurement*	*problem cost*
project one					
project two					
project three					
project four					

project five					
project six					

Thank you!!!!!