Addis Ababa University

College of Business and Economics

Department of Public Administration and Development Management

Challenges and Prospects of Internal Road Infrastructure Development: The Case of YekaSub-city Administration

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Challenges and Prospects of Internal Road Infrastructure Development: The Case of Yeka Sub-city Administration

By

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Acronyms

AACRA: Addis Ababa City Roads Authority

CBO: Community Based Organizations

CPCO: Cobblestone Project Coordination Office

CPDA: Community Participation Development Agency

CPDO: Community Participation Development Office

CSCBP: Construction Sector Capacity Building Program

DFID: Department for International Development

DTTS: Department of Transport, Tourism and Sport

DECLG: Department of Environment, Community and Local government

ERA: Ethiopian Roads Authority

ERF: European Union Road Federation

FDRE: Federal Democratic Republic Ethiopia

GIZ: Gesellschaft für Internationale Zusammenarbeit

LDC: Local Development Committee

LUSUP: Leveraging Urban Spending to Maximize Benefits of the Urban Poor

MSEs: Micro and Small Enterprise

MUDC: Ministry of Urban Development and Construction

NGO: Non-Governmental Organization

TVETA: Technical and Vocational Education and Training Agency

ULG: Urban Local Government

ULGDP: Urban Local Government Development Project

UN: United Nations

UNCDF: United Nations Capital Development Fund

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Abstract

Cobblestone road is one of the infrastructure developments implemented in many cities of the country since 2008 in all of Sub-Cities of Addis Ababa city administration. Many internal roads are constructed jointly by the community and government participations. The roads have many benefits, i.e. creating job to the city youths and helping to minimizing the number of youth's unemployment in Yeka Sub-city in particular and in Addis Ababa city administration in general. Besides, the cobblestone project making all the surrounding environments attractive and beautiful and the internal roads are always facilitating the overall service delivery within and outside the sub-city. As to the researcher observation a significant part of the cobblestone roads are not well maintained and properly used. This research work tried to assess and examines the Challenges and Prospects of Internal Road Infrastructure Development. The study was conducted in both a descriptive way of quantitative as well as qualitative research approach. The unit of analysis for this study is Yeka Sub-City as a case study which has 10 Woredas and among which Woreda 01, Kebeles 01 and 02 were sampled purposively, while respondents are randomly selected from residents in the selected areas. Data were collected through questionnaire and interview of key informants, observation of the field and critically reviewing documents and reports of the concerned Woreda, sub-city, regional as well as and other relevant government offices. The findings indicated that cobblestone roads are benefiting the community, who assured for benefits they have obtained. Whereas, the roads are getting damage due to other infrastructure development works by some government institutions; and individuals who needs to fix their waterline. The community's sense of ownership has improved in fear of losing the roads' quality and benefits due to damages in the roads. The roads are deteriorating because of the absence road management together with poor maintenance after construction. Water pipes and sewerage pipes, are some of the reasons damaging the roads. Reconstruction/maintenance of the road by the responsible individual results in poor road maintenance. Another significant problem observed was improper ditches /resulted in water or mud overflow to the roads. Based on the conclusion, some of the recommendations are: develop the sense of community ownership in order to preserve, manage and maintain the development outcomes without expectations to the government or each other. Furthermore, there should be directives to administer the roads, the local government should make a smooth space for the community to develop the sense of ownership, and the local government should be committed in following up of these activities and there should also be routine or regular maintenance activities.

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Chapter One

1.1. Introduction

In recent years, cobblestone road creation has become one of the most successful infrastructure and job creation programmes in the country, with tremendous benefits for the urban poor. It has created hundreds of thousands of jobs, greatly improved urban mobility, and built collaborative relationships between communities and local authorities. The investments in cobblestone roads have also attracted international attention. In 2013, UN-Habitat awarded the Ethiopian Ministry of Urban Development, Housing and Construction (MUDHCo) with a prestigious Scroll of Honor Award for the initiative. The initiative was supported jointly by the German Development Cooperation and the Bill & Melinda Gates Foundation, which is funding cobblestone road production in eight secondary cities throughout the country. The project is being implemented by MUDHCo in partnership with the German Organization for International Cooperation (GIZ) and the German Development Bank KFW.

> *The roads of a country are accurate and certain tests of the degree of its civilization. Their construction is one of the first indications of the emergence of a people from the savage state; and their improvement keeps pace with the advances of the nation in numbers, wealth, industry, and science –all of which it is at once an element and an evidence.*
>
> **W. M. Gillespie, 1848, p. 15**

Cobblestone roads construction is the earliest experience of many cities in Europe, United States of America and other advanced parts of the world. Hence, using stones for paving streets is not a new idea in the world (Treskon, 2006:3). But, in Ethiopian it is the newly emerging practices since 2005. As TVETA-MoE (2014:25), the Construction Sector Capacity Building Program (CSCBP) started the Cobblestone Project in 2005 in a dual effort to create job opportunities and income for youth, and to provide attractive and

long-lasting road and pavement in Ethiopian cities. Built on a principle of local resource utilization, Cobblestone projects include labor-intensive jobs like quarrying, chiseling, transporting, and paving, as well as the production of tools needed. According to MUDC (2012.), "one of the priority services selected by ULGs for improvement is improved road access through the construction of Cobblestone roads. All participating ULGs have included Cobblestone road construction as part of the prioritized Capital Investment Plans (CIPs). Cobblestone road construction is comprehensively labour intensive and requires skilled labour.

Cobblestone paved streets solve social and economic problems of the community like unplanned settlements of the Addis Ababa City in general and Yeka Sub-City in particular, which is complicated by unplanned houses and roads. As Van Esch and Fransen (1997:3) argued, "The access roads in unplanned settlements are very poor, and are often characterized by serious flooding, large potholes and open holes (e.g. manholes) creating dangerous situations for the road users and residents. Quite often the settlements are not accessible in case of emergencies like fire or accidents. The absence of access can also hamper social and economic development as for example trucks providing supplies to small enterprises, charcoal truck, pit latrine emptier and waste collection trucks cannot enter the settlement". According to MUDC (2012:2), Cobblestones are ease of maintenance and lifespan -Cobblestone roads have a longer life span than asphalt roads. Treskon (2006:14) also argued that Cobblestones last a long time.

As to roads, the most common problem is neglecting the maintenance aspect. After building new roads at a very high cost (money) and leaving them without maintenance obviously makes them to deteriorate very quickly. If nothing is done, roads with a design life of decades can need replacing or major repair work after just a few years. Maintenance is required to be carried out from time to time to restore its condition to be close to its as constructed state. If maintenance is not carried out the road will continue to deteriorate making passage increasingly difficult, uncomfortable and expensive to road users (ERA, 2011:9). So it is very important to preserve and manage the existing paved roads which could be deteriorated because of so many reasons. Preserving this Cobblestone paved streets can also be used as a good base or foundation for asphalt in the

long ran as stated that even though the stones themselves may be obsolete surfacing (Treskon: 2006:13).

What so ever may be the reasons; Cobblestone roads in Yeka Sub City are becoming badly managed and deteriorated within some few years after construction, there is not any good management of Cobblestone roads just considered these as an asset. So the main points raised here in this research paper for discussion will be issues related with the management and maintenance of the roads. Questions like what impacts do these roads have on development, what are the main reasons for the problem created and what is the role and responsibility of the local government and participation of the community in constructing, managing and maintaining the roads, and what are the preconditions needed either to make the roads last long or to have a minimum maintenance cost at some interval of time are some of them to be answered in the study in a slight description how the Cobblestone roads are being constructed.

The community and the local government are participating in the construction and pavement of the Cobblestones as doing in every activity of local development in a very little participation of other development actors or stakeholders. But this type of participation is not clearly seen or repeated in keeping the safety of the Cobblestone roads by developing the sense of ownership. When people have a direct hand in deciding the course of action to better their environment, they develop a strong sense of ownership that leads to their active involvement in improvement and maintenance activities (PPS, 2008:31).

As the Cobblestone road construction in urban areas is a new emerging practice in Ethiopia, there are very few research was conducted in relation this topic in Addis Ababa in general and Yeka Sub-city in Particular. Hence, the focus of this study was "Challenges and Prospects of Internal Road Infrastructure Development: The Case of Yeka Sub-city Administration".

1.2. Statement of the Problem

It is obvious that Cobblestone road construction is playing a great role in bringing about social, economic and environmental benefits at the local and national level. Lots of jobs could be created for the people (Tiwari, 2011:74). It is cost-effective compared to concrete or asphalt roads, it makes towns and cities more beautiful, benefits residents and encourages tourism; is easy to maintain and has a much longer lifespan than asphalt roads. It is labor-intensive, creates jobs and opportunities for construction entrepreneurs; uses natural and local materials and does not require imported machinery; does not depend on imported oil, it does not contribute anything (temperature) to global warming, etc. (UN-Habitat, 2013:2).

Despite all the above social and economic benefits and advantages are that the Cobblestone road construction is bringing about, it is facing challenges. Cobblestone roads are not managed and treated well and as such they start deteriorating due to these reasons as the researcher observed them in many parts of the city in general and the Yeka Sub-City in particular that they are deteriorated. The community is also calling the government for taking any action on the roads which are deteriorating over time after construction.

When the project for this particular activity is designed, launched and started implementation, there has been said or planned nothing about the future fate of the roads, their management and maintenance. The local government also focuses only on the process of and the result from the construction in the light of creating jobs for the unemployed people, making the city clean and beautiful and, thus, focuses only on the report of the performance of the implementation (plan and actual) of the construction in relation to the existing unpaved earthen road. In principle, however, if any road is managed badly and not maintained routinely or periodically it will inevitably be deteriorated completely to the extent either difficult to maintain or causes to expend a high cost to maintain or reconstruct it. This is also true for the Cobblestone paved roads.

The other problem is reluctance of the local government as the community in any social meeting always poses a question towards the government for not taking any measure on

the cobblestone roads as they are deteriorating within few years after construction. And of course the government has the premier responsibility for everything which happens on these roads. And their lack of participation on the part of the community and other stakeholders in preserving; managing and maintaining the Cobblestones paved streets even though they highly participated in the construction by contributing in different ways. Cumulatively, these problems result in either additional resources or a complete loss of the existing resources. With all the above, this study will assess challenges and prospects of internal road infrastructure development and analyze the general opinion and understanding of the community and the local government towards the cobblestone paved roads.

The above problems invited the researcher to carry out a study on Challenges and Prospects of Internal Road Infrastructure Development: The Case of Yeka Sub-city Administration. To achieve this purpose, the researcher specifically formulates the following basic research questions:

To address or to meet the research objectives, the research focus on the following basic questions:

1. What are the major prospects of internal road infrastructure development in Yeka Sub-City?
2. What are the key challenges observed while constricting and maintain cobblestone roads construction in Yeka Sub-City?
3. How can the current status or condition of the paved roads be described?
4. What should be the roles and responsibilities of the local government and the participation of the community in cobblestone roads construction in Yeka Sub-City?

1.3. Objectives of the Study

1.3.1. General Objective

The general objective of this study is to investigate Challenges and Prospects of Internal Road Infrastructure Development: The Case of Yeka Sub-city Administration.

1.3.2. Specific Objectives

The study tried to address more specific objectives as follows:

1. To assess the community acceptance to the quality of the roads?
2. To identify the benefits these roads have brought to the community?
3. To understand the major problems and challenges experienced during and after the construction of the roads?
4. To investigate the roles and responsibilities of the local government and participation of the community in the management and maintenance of the cobblestone road construction?

1.4. Scope of the Study

The researcher has found that it is very important to delimit the scope of the study to a manageable size in order to investigate the issue thoroughly. Addis Ababa is classified in to ten sub-cities; out of these sub cities the researcher selected Yeka Sub-city purposely. This is therefore; the research was confining only to in a single Sub-city (Yeka) for the sake of in-depth analysis with genuine investigation on challenges and prospects of internal road infrastructure development: The Case of Yeka sub-city Administration".

1.5. Significance of the Study

Nobody may have information at what status these cobblestones roads construction are as their condition was not assessed and evaluated. Once constructed, it is not clear what challenges will be observed in the roads. What gaps should be bridged or filled and what assignments should we take next time from the past experience of this Project. There is not also any organized document of an empirical assessment and evaluation of the overall condition of the cobblestone roads at the national, City and Sub-City level. Hence, this paper was intended to identify and analyze the Challenges and Prospects of Internal Road Infrastructure Development: The Case of Yeka Sub-city Administration.

1.6. Organization of the Study

This study was organized in a way it comprises five chapters. The first chapter consists of an introduction which consists of background of the study, statement of the problem, objectives of the study, significance of the study, delimitation of the study and definition of terms. The second chapter discusses about the review of related literature. The third chapter deals with the research design and method of the study. The fourth chapter deals about presentation, analysis and interpretation of the data. The fifth chapter deals with the summary conclusions and recommendations of the study. Finally, references and a set of appendices were included that contain the interview guide and observation checklist that will be used to collect primary data for this work and other supplementary documents of the study.

Chapter Two

2. Literature Review

2.1. The Nature and Concepts of Internal Road Infrastructure Development

2.1.1. Cobblestone Development

According to the Encyclopedia Britannica (cited in Tiwari, 2011:73), Cobblestones are stones that are frequently used in the pavement of early streets. 'Cobblestone' is derived from a very old English word 'cob', which had a wide range of meanings, one of which was 'rounded lump' with overtones of large size. 'Cobble', which appeared in the 15th century, simply added the diminutive suffix 'le' to 'cob', and meant a small stone rounded by the flow of water; essentially, a large pebble. It was these smooth 'cobbles', gathered from stream beds that paved the first 'Cobblestone' streets. "Cobblestone" itself, (Treskon, 2006:3), is a messy term. Strictly defined, it refers to a rounded water- worn stone used for paving streets. However the term often refers to any number of stone paving types.

ERA (2011:105) defined Cobble Stone (Dressed stone) - as Cubic pieces of stone larger than setts, usually shaped by hand and built into a road surface layer or surface protection. According to BASMAA (1999:53), Cobbles are larger granular materials and their sizes generally range from approximately 6" to 24" diameter and are available in a variety of stones and colors. Cobbles are useful as a permeable pavement in areas where little traffic is desired, such as under large trees, or in hard to maintain areas such as median islands. Cobbles have similar construction characteristics as gravel, except they are somewhat more labor intensive to install because each cobble must generally be set individually (ibid). Cobbles, according to OGUT and KUTLUHAN (n.d.:2), are by definition naturally occurring water worn stones of a size suitable for paving. A Cobblestone pavement consists of such stones, between 125 and 250 mm deep and rather less in length, set individually in a sand bed about 150 mm thick. Stones are laid to a

random bond, rammed into place and covered with a 10 mm layer of sand to work into the joints under the action of traffic.

2.1.2. Nature of the Cobblestones Road Development

The nature of the Cobblestone roads normally depends on the size of each Cobblestone, the status, and position of laying the stones on the already prepared sub base. If a single Cobblestone is displaced (scattered) from the normal position it is put, there is a possibility for the whole Cobblestones to displace. Its nature enables it to simply deteriorate or destruct if it is not constructed in quality as the stability of one Cobblestone in its place depends on the stability of the other. The edge or the end of the roads which has a connection or a join with asphalt or earthen road can simply be destroyed unless strongly fixed with a cement or concrete. The curve stones should also be properly erected, stuck or fixed by cement and other materials in order for it to hold the Cobbles. If the joint area between the end of the Cobblestone roads and either asphalt or earthed road is not constructed with the help of big stone and cement, it will simply deteriorate and makes other Cobblestones to scatter as practically observed in the field in

2.1.3. Transforming Local Economies with Cobblestones

Cobblestone paving makes perfect sense for Ethiopia's burgeoning urban roads. It is labour-intensive, creating jobs as well as opportunities for construction entrepreneurs. It uses natural and local materials that are plentiful. It is also cost-effective compared to concrete and asphalt roads, easy to maintain and has a much longer lifespan. Moreover, it is easy to replicate elsewhere, because the investment needed is relatively small and production skills are easy to learn.

Initiated and coordinated by the federal government as part of its Leveraging Urban Spending to Maximize Benefits of the Urban Poor (LUSUP) initiative, the cobblestone project is implemented by local communities themselves. Community representatives accompany city administrations to practice the job tender procedures, and they are assisted in monitoring the construction quality. Training centers ensure that the competing micro and small enterprises acquire the skills needed for chiseling, paving, and project management – key capacities if the cobblestone project is to turn temporary

job creation into permanent employment. Citizens monitor and oversee the cobblestone road construction, fostering strong community ownership.

These changes are transforming Ethiopia's city marketplaces into better connected, economically vibrant places. People are able to move around cities more easily, both in vehicles and on foot. Public transportation and solid waste management collectors are able to reach previously unreachable neighborhoods. Flooding has diminished during the rainy season, and residents have a much healthier environment than with the old dirt roads. Small enterprises are opening for business, and investment in private homes is rising.

2.1.4. Cobblestone Paving

Paving roads with cobblestones begun in Egypt more than 3.500 years ago. From then on, cobblestone pavements were used worldwide in cities such as Berlin, New York and Paris. In Ethiopia, the Germany International cobblestone project was introduced in 2006 as part of the university capacity building programs. Adama was the first city to train workers in the different processes of producing and paving with cobblestones. In one year, the German cobblestone experts have trained more than 5000 people with whom they have paved 20,000 square meters indaba city (UCBP, 2008).the initiative falls under construction sector of micro and small enterprise. It promote using of local resources in a very labor intensive process to pave roads, saving the foreign currency needed to purchase the components of asphalt and at the same time providing jobs to large numbers of Ethiopians.

According to UN-Habitat (2013) report on Cobblestone initiative in Ethiopian experience, Cobble stone paving is a labor intensive initiative that creates substantial job opportunities in different activities such as quarrying, chiseling, transporting and paving. Employment in the cobble stone sector is open to all including the disabled, and focuses largely on unemployed young people and women; it has given a chance to establish a lot of micro and small enterprises on manufacturing and other construction sectors. In the last few years in capital city of Addis Ababa alone about 2,240 Micro and Small Enterprises were established and engaged in the cobblestone road construction. Among them 254 Enterprises were engaged under cobble stone paving sector. The project covers

all sub-cities of Addis Ababa and includes pedestrian and vehicle roads, condominium Villages, recreation areas and parks, organizations and residential areas.

The initiative improved urban roads coverage and meets the country's road need at a cheaper cost by using natural and local materials with no requirement for imported machinery. In terms of roads constructed or paved (as per the World Bank standard of **7** meter width) between 2008-2012/13 more than 2,202 km of cobblestone roads, taxi terminal, feeder roads and public squares have been built. This provides safe walk way, reduction of dust and mud; reduce traffic jams, and improved marketing linkage of related and unrelated business along the value chain. In the employment creation process, the initiative helps beneficiaries by generating income for daily consumption and savings. This sector also Improved Saving Capacity and Promote the Operators to Medium Level Enterprise .The aim of the initiative was not to retain the operators in this sector forever. It aims to improve the culture of saving of the operators and enables them to transfer to the other productive sectors of the economy such as manufacturing, construction, textile and others. As indicated in the MSE development strategy document the operators are expected to save 10% -20% of their income and hence, the operators have saved millions of birr and have been enabled to establish medium level enterprises (MUDCO and UN-Habitat, 2013).

2.2. Rational for Cobblestones Activities in Ethiopia

In brief, cobblestones meet Ethiopia's urban road needs. Cobblestone paving is labor-intensive, creates jobs and opportunities for many citizens, uses natural and local materials and does not require imported machinery; does not depend on imported oil, as asphalt does, is cost-effective compared to concrete or asphalt roads; makes towns and cities more beautiful, have benefits residents and encourages tourism; is easy to maintain and has a much longer lifespan than asphalt roads (MUDCO and UN-Habitat, 2013).

Generally in Ethiopia the growth of urban infrastructure is not harmonized with that of the ever growing number of urban population. In most cities across Ethiopia's urban roads are in urgent need of upgrading, since many secondary or internal roads were dusty, sandy or graveled. Residents are faced with mud during the rainy season and dust for the rest of the year. In light of this, Ethiopia where the unemployment rate is high and the

young population makes the highest proportion of unemployed, the cobblestone initiative can make a difference in solving these problems and alleviating poverty in urban area.

Key Actors in Cobblestone road Construction

The main actors that participated in the cobblestone roads construction are the following.

- The Community Participation Development Agency,
- The Addis Ababa City Road Authority,
- The Cobblestone Project Coordination Office,
- The Sub-City Community Participation Development Office,
- The Sub-City and *Woredas* Construction and Housing Development Offices,
- The Community,
- Some MSEs
- Contractors and
- GIZ

2.3. Internal Road Infrastructure and Access to Job Opportunities

The urban poor have benefited tremendously from the initiative, especially youth and women. Accordingly, 489,000 new jobs created between 40-45 percent of the jobs have been filled by job seekers. Many participants are previously unemployed youths, who have now obtained new skills and livelihood strategies as part of the project. This employment has helped given them a sense of empowerment and community pride. “The women in the communities we spoke to were often the most vocal in their appreciation for the project, which provided them with additional income, skills, and helped free up time from the ‘double burden’ of unpaid care work in the home,” said Nicola Demme, Programme Manager of the GIZ LUSUP Project.

Demme visited several work sites this past February with a Cities Alliance team who is providing technical advisory services and grant portfolio management oversight to the Bill & Melinda Gates Foundation grants in the country. Peter Maats of the German

Development Bank KfW was also struck by women's enthusiasm for the project. "One woman in Yirgalem city expressed delight that she didn't have to rely on her husband as much for livelihood and income now that she had participated in the project, and that her daughters also wanted to be trained in similar skills," he noted.

2.3.1. Urban Roads Development

Even though there are different types of urban local roads or streets depending on the functions they provide and the way they are constructed and maintained, for the purpose of this paper urban roads or streets refer to those roads constructed with Cobblestones. Streets are defined as public thoroughfares in a city or town, including curbs, gutters, and sidewalks on one or both sides and Roads are defined open, general public ways for the passage of persons and vehicles (EOA, 1996). In urban areas, roads generally comprise the most important part of the transport infrastructure system.

Access to roads by people depends chiefly on the availability of roads, their condition, design and the means by which people can reach them and travel on them (Leyland and van Esch, n.d). As Van Esch and Fransen (1997:3) stated, "The access roads in unplanned settlements are very poor, and are often characterized by serious flooding, large potholes and open holes (e.g. manholes) creating dangerous situations for the road users and residents. The absence of access can also hamper social and economic development as for example trucks providing supplies to small enterprises, charcoal truck, pit latrine emptier and waste collection trucks cannot enter the settlement".

In recent years new street standards have been gaining acceptance that meets the access requirements of local residential streets while reducing impervious land coverage. These standards generally create a new class of street that is smaller than the current local street standard, called an "access" street. An access street is at the lowest end of the street hierarchy and is intended only to provide access to a limited number of residences.

2.3.2. Road Infrastructure and Construction Projects

Roads has a key role to play in transporting people goods physically; scholars researched, cobblestone roads which are the one indigenous material based, labour intensive, environmentally sustainable and viable infrastructure, also one of the best practices in the

country adopted as a preferable mode of infrastructure provision policy specially in the interiors of the Ethiopian cities. Challenges, opportunities, employability potentials of cobblestone roads and its role in poverty alleviation are largely analyzed by the scholars (Ahmednur 2009and Adem 2011a,).

Additionally, provision and management of road Infrastructure, its integration with other infrastructures, role in city development, performance of Ethiopian road fund in road maintenance, community participation in planning, construction, maintenance, road safety, economic role of roads, are some other issues which are considered for research (Dereje 2009 and Asnake 2011).

2.4. Internal Road Management and Maintenance

According to IBRD (2002), Management is a cyclical process involving the formulation of goals; planning and programming; implementation; operation and maintenance; monitoring and evaluation; and application of information derived from monitoring to planning and operational functions. Road management is defined as the process of maintaining and improving the existing road network to enable its continued use by traffic efficiently and safely, normally in a manner that is attempting to optimize the overall performance of the road network over time. But for the purpose of this paper management of roads will not be discussed in detail with all its functions of planning, programming, preparation and operation as this focuses mostly in high ways and/or ring roads.

Management of roads in this case is administration, managing and preserving of the road even though the management functions are included in this aspect to administer them and to indicate also whose responsibility is it also and so the management and maintenance concepts are only for the Cobblestone roads to apply.

2.5. Internal Road Infrastructure Development and Community Participation

Participation can be defined differently by different scholars and/or organizations for different purposes even though the meaning of the definition broadly remains the same. But to be specific for the purpose of this paper, participation in infrastructure service management is defined by IBRD (2002:32) as "a process whereby people-as consumers and producers of infrastructure services and as citizens-influence the flow and quality of infrastructure services available to them. Participation is based on voluntary relationships between various actors, which may include government institutions, individual infrastructure users, community-based organizations, user groups, private enterprises, and non-governmental organizations."

One of the key objectives of participation is to incorporate local knowledge and preferences into the decision-making processes of governments, private providers, and donor agencies. When potential beneficiaries are able to make key decisions, participation becomes self-initiated action—what is known as the "exercise of voice and choice" or "empowerment." Participation is expected to lead to better-designed development projects, more effective service delivery, and improvements in the targeting of benefits (IBRD, 2013:15).

2.5.1. Road as an Asset

Roads ensure mobility – in your neighborhood, your municipality, the region or beyond – and enable much more. The quality of the road network affects almost everybody in daily life. Therefore users, residents, consumers, employees, businessmen or taxpayers, we all should care that roads are managed efficiently and are able to deliver good service to society (ERF, 2014:6).Roads are one of the major financial community assets and provide large benefits to the society. But, due to poor asset management, many road networks are in danger and Road Asset Management provides decision makers with the necessary tools for efficient and sustainable management of roads (ibid:4-5).

2.5.2. Maintenance of Roads

Once physical improvements have been made to a place, they need to be maintained. They need to be cleaned and scrubbed and shined. If they break, they need to be repaired, and if they show wear, they need to be spruced up. It also helps to have a visible presence on hand to help promote a place's security (Project for Public Spaces, 2008:30). These are the key elements of any management program, which usually involves joint funding and cooperative efforts of the private sector and city governments. Although the nuts and bolts of management programs are maintenance, sanitation and security, good management means much more than that (ibid). Road maintenance includes all activities carried out with the intention of maintaining the functions and to maintain the properties for which the road was designed (ibid, 2011:15).

Urban Road maintenance is one of the most important components of the entire road system and should be accorded due importance (Shah, Jain &Parida, 2014: 238). Roads are among the most important public assets in many countries. Road improvements bring immediate and sometimes dramatic benefits to road users through improved access to hospitals, schools, and markets; improved comfort, speed, and safety; and lower vehicle operating costs. For these benefits to be sustained, road improvements must be followed by a well-planned program of maintenance. The purpose of maintenance is to ensure that the road remains serviceable throughout its design life and the main two reasons of its importance are: (i) Prolongs the life of the road by reducing the rate of deterioration, thereby safeguarding previous investments in construction and rehabilitation, and (ii) Sustains social and economic benefits of improved road access (ILO, 2013).

According to the IBRD (2002:77-78), Cities usually have a massive investment in their road systems, which are often very poorly maintained and World Bank–funded projects typically show very high returns on maintenance expenditures. Yet there is a persistent tendency to underfund maintenance. Much of the problem of road maintenance is rooted in its economic and institutional aspects. Inadequate incentives and weak accountability derive from the characteristic separation of responsibilities and control between the providers and users of roads. Unlike most other types of infrastructure, roads are neither built nor maintained by those who use them to market output or services (WB, 2004).

The cost of a road construction over its service life is a function of the design, quality of construction, maintenance strategies and maintenance operations. Unfortunately, designers often neglect a very important aspect which is the possibility to perform future maintenance activities. (DFID (2003: i) also supports this idea by stating that "the maintenance of communal resources and particularly transport infrastructure has been neglected in the past and a cycle of re-construction or rehabilitation has evolved".

According to van Rijn (2006:4), there are different types of maintenance: routine maintenance, periodic maintenance, reconstruction and emergence maintenance. As the manual of MLGPC (2008), road maintenance activities can be classified as Routine Maintenance, Recurrent Maintenance, Periodic Maintenance and Urgent Maintenance based on the nature of each activity and the frequency at which they should be carried out.

As clearly indicated in the bulletin of the Addis Ababa City 15 year's journey of the road development (AACRA, March 2014: 95), annual capital budget is always allocated for the construction and maintenance of the asphalt roads, gravel roads, pedestrian walk way and other different types of projects. But for the Cobblestone roads, budget is allocated only for construction. Handling, good management and maintenance of these roads are ignored.

2.5.3. Community Participation and Commitment

Different scholars argue for community participation in different local development initiatives in general and in the overall processes of constructing, managing and maintaining of roads specifically. The World Bank (1994) defines participation as "A process through which stakeholders' influence and share control over development initiatives, and the decisions and resources which affect them." Communities maybe involved in the planning, management, implementation and maintenance of public infrastructure. Van Esch and Fransen (1997:7) also clearly stated that Communities may fully participate in the planning, construction and maintenance of public infrastructure, or may fully manage only some of these activities. Of the two, community management has the significant advantage that it promotes the feeling of local ownership, which is an important motivator for local maintenance.

They (ibid) added also that the Community management requires commitment from the community, which is most likely if the community directly benefits from the activity. For example: construction and maintenance of a road within the boundary of the community specifically benefits the community, while many people benefit from a road connecting two villages. The community will thus not be very committed to construct and maintain the road between the two villages, since it is not “their road”, while they would construct and maintain a road within their boundary. Local participation in the final stage of maintenance and operation of the created assets may provide the only feasible solution to sustaining the infrastructure investments.

Hence, involving communities in decision-making will lead to better decisions being made, which are more appropriate and more sustainable because they are owned by the people themselves. Participation can reduce the risk of project failure and the cost of the project.

Participatory development programs usually invest a good deal in building community infrastructure. The argument for doing so is twofold. First, lack of adequate infrastructure—connector roads, wholesale markets, irrigation channels, electricity, school buildings, sanitation, and the like—significantly constrains prospects for development, and this lack is far more acute in the poorest communities. Second, it is expected that devolving responsibility to the local level will produce projects that are not only better aligned with the preferences and needs of final users, but are also of higher quality, and more likely to be well maintained.

Participation enhances user "ownership" of facilities, thus helping to ensure fuller and more efficient use, better maintenance and more reliable operation (IBRD, 1996:1). Ideally, participatory programs are expected to work with communities to ensure need, feasibility, and adequacy of scale; to monitor the project over the construction cycle; and to create systems for project maintenance. Most programs require some form of community co-financing as a mechanism for inducing greater community engagement and “ownership” of the project. Some also require upfront community commitment of resources for project maintenance. According to PPS (2008:31), when people have a direct hand in deciding the course of action to better their environment, they develop a

strong sense of ownership that leads to their active involvement in improvement and maintenance activities.

According to IBRD (1996), participation is considered to be a means for achieving other objectives, such as cost reduction in the construction of new facilities or improved maintenance of completed facilities and it is also considered as an end in itself. Hamilton (1992) cited in SahebZadeh and Ahmed, 2010) supports or advocates this idea by arguing that participation as a 'means' ensuring local people's cooperation/collaboration with externally introduced programs or processes to facilitate the effective implementation of such initiatives and to achieve a set of objectives; and participation as an 'end' the empowerment of people to take greater responsibility for their development through their acquisition of skills, knowledge and experience.

Community Based Organizations can be a partner in constructing and maintaining (small scale) infrastructure. International experience suggests community contracting as a mechanism to involve CBOs in the actual work (Van Esch and Fransen, 1997:11-12).

Maintenance of infrastructure should be addressed from the start of the project, by involving all relevant parties and by providing training. Organizational structures, policies and laws also need to be adjusted to suit the local situation. By-laws may for example allow CBOs to obtain funds for maintenance from the local population (ibid. 12).

2.5.4. The Importance of Local Government Responsibility

A focus on the local goes beyond questions of organizational scale and efficiency to the fundamental question of who is responsible for local development and how this responsibility can and should be institutionalized (Helling, Serrano & Warren, and 2005:12). People living and working affirm their responsibility by making the decisions, mobilizing and managing the resources, organizing the collective action, delivering the services, and ensuring the accountability of officials and organizations that contribute to local development. Without this commitment to responsibility by local actors, desired economic and social development will remain dependent on decision-making and management from above (ibid: 12-13).

The operational framework for planning and implementing ULGDP investment projects will be through a consultative process with the appropriate stakeholders at the local government level. At the city level, the Mayor's office will be responsible for the overall performance of the ULG especially regarding planning, financial management, and infrastructure service delivery (MUDC, 2012). According to UNCDF(2005: 4), "infrastructure is likely to produce intended outcomes with the involvement of local stakeholders (primarily local governments) and the private sector: In fact, empirical evidence shows that infrastructure investment is particularly effective when local stakeholders are fully involved in the decision-making process and in the management and the maintenance of the infrastructure."

The importance of local government, as Atkinson (2002:3) stated, is based on several key factors. Firstly, local government is intrinsically multi-sectorial. It is the only sphere of government that has the mandate to bring together a variety of sectorial issues within one developmental policy, program or project. Secondly, local government is 'closest to the people'. But local governments have weaknesses. According to UNCDF (2005: 6), one of the weaknesses is that they have inadequate human, financial and logistic resources and local government administrative staff usually lacks basic technical and managerial skills and this may have a direct impact on the quality of public service.

2.6. Historical Background of Cobblestone Development

As the practices and concepts related to Cobblestones roads which were experienced in early nineteenth and late twentieth century in different cities of Europe, United States of America and Latin America, there is a lack of literature review for this topic. And how the Cobblestone road construction was started in Ethiopia is discussed in detail as a review under this title though there is also a lack of related literatures. Despite this, the general principles, commonly accepted concepts to the topic and the historical background of these types of roads are discussed below.

2.6.1. The Beginning of Cobblestones

The first record of stone paving dates back to 4000 BC in Assyria and by 2000 BC, flagstones were being used to pave village streets. Cobblestones were the traditional method of stone paving, being uncut and often water-worn stones or large pebbles about

150mm in size. Later hand-cut stone blocks were introduced (CMA, 2009:4). The Cobblestone road construction was practically implemented early in the eighteenth and nineteenth centuries in most of the cities of Europe, United States of America and some of the cities in Latin America. By the end of the nineteenth century, street pavement was synonymous with modernity. Municipal authorities around North America struggled to improve not only the health and appearance of their cities, but also the movement of vehicles (Williams, 2013:20).

The development of a specific form of road stone could (and would) be cited as an exemplar of rational Positivistic progress: by 1900, a very specific shape and type of Cobblestone had emerged as best suited to urban traffic throughout North America and Europe (Treskon 2006:2) . And Cobblestones played a central role in the urban environment at the turn of the 20th century. The size, layout, and even spacing between these stones all had developed so as to increase their general utility. However, Cobblestone streets were already being paved over later on by asphalt and other similar pavements throughout cities (ibid: 10).

2.6.2. Introduction of Cobblestone in Ethiopia

Some argue that Cobblestone Pavement is not really a new concept, even for Ethiopia, where the technology was used over 100 years ago as ECBP (cited in Azeb, 2011: 16). CPCO (June, 2011) also described in its document in support of this that Cobblestone in Ethiopia was first introduced by the French experts some 100 years ago during the construction of Ethio-Djibouti rail way. Beyond this fact however, this construction could not show any progress for a long period of time, and recently, the idea of Cobblestone has started again in different areas of the country in collaboration with the German Technical Cooperation of Engineering Capacity Building Program (ibid).

The Construction Sector Capacity Building Program (CSCBP) started the Cobblestone Project in 2005 in a dual effort to create job opportunities and income for youth, and to provide attractive and long-lasting road and pavement in Ethiopian cities. Built on a principle of local resource utilization, Cobblestone projects include labor-intensive jobs like quarrying, chiseling, transporting, and paving, as well as the production of tools needed (TVETA-MoE, 2014:25).

As UN-Habitat (2013:4) described in its document, Cobblestones technology was introduced by the Mayor of Dire Dawa following a visit to France.

It is only recently (2008) that paving streets with Cobblestone was introduced to the rest of Ethiopian cities. In 2008 the initiative was started in Adama Town as a pilot and up scaled to 19 World Bank supported ULGDP Towns and further spread to 140 regional cities and towns. And in terms of roads constructed or paved (as per the World Bank standard of **7** meter width) between 2008-2012/13 more than 2,202 km of Cobblestone roads, taxi terminal, feeder roads and public squares have been built (ibid: 5). Addis Ababa, as a capital city of the country, is also the one which is implementing the Cobblestone road construction in its all Sub-Cities. And Yeka is also the one which is covering almost most of the earthed roads with Cobblestone in all the *Ketenas*, K*ebeles*and *Woredas*.

2.7. Lessons Learned

The cobblestone project has valuable lessons for other countries interested in pursuing a similar approach. They are:

- **Investing in community mobilization and ownership is critical for strong monitoring and quality control.**

  Community groups in many of the communities, including Yirgalem city, valued the benefits to the local economy brought by the new road so much that they voluntarily carried out quality assessments and partnered up with the city administration to monitor the construction progress. When substandard stones were identified in the road, these community committees ensured that the stones were replaced.

- **Sustaining community participation requires capital investment in cities.**

  It is extremely difficult to sustain community mobilization efforts or municipal government interest in participatory planning if the processes are not followed by capital investments. Focusing on the linkage between planning, community

mobilization and practical project implementation helps to ensure sustainable community involvement and government receptiveness.

- **Strengthening the capacity of national staff supports project sustainability.**

  By balancing resources to build national staff capacity, the project has been able to move beyond the grant lifecycle and is on its way to becoming institutionalized.

The Cities Alliance has a growing portfolio in Ethiopia, which has been a member since 2006. The partnership has supported the establishment and operation of the Ethiopian Cities Network, the development of an integrated urban database, and a State of the Cities Report, among others. Ethiopia has also been a key player in the process of formulating a Cities Alliance Africa Strategy, hosting the initial meeting to in Addis in March 2013. The relationship is expected to strengthen even further in coming years, as Ethiopia has expressed interest in becoming the next Cities Alliance Country Programme.

2.8. Sustainability of Urban Local Roads

According to (IFRC, 2012:47-48), it is important to integrate the principles of sustainability from the earliest stages of (re)construction in order to:

- Build on local knowledge and utilize local materials for rehabilitation and (re)construction where appropriate
- In the event where local communities are to operate/maintain the infrastructure, they should be involved in the project cycle from the onset and their voices heard.
- Increase communities and local authorities' knowledge and capacity on how to operate and maintain the infrastructure that they will eventually take over

Implementing sustainable urban streets can create more livable communities. With amenities and attractions closely located, individuals are more likely to utilize alternative mode choices such as walking, biking or transit, which leads to improved health of individuals and the environment. Total vehicle miles traveled are reduced and less land

needs to be developed because of a greater population density. Streets busy with pedestrian and bicycle traffic are safer and strengthen a sense of community (Bevan et al, 2007:4).UN-Habitat (2013:12) stated that Simple technology, local resource utilization, low maintenance costs and labor-based technology are key factors in the sustainability of Cobblestone roads.

Cobblestone roads are economically and financially sustainable. The increasing share of women in Cobblestone road construction contributes to gender equality and thus to the social sustainability of the initiative. By using local natural resources - stones -the initiative effectively contributes to reducing dependence on asphalt (a non-renewable energy). Other factors of sustainability are also very much in play: Cobblestone roads are well known for their durability. In many developed countries they have lasted for hundreds of years and many of them are tourist attractions (ibid).

Chapter Three

3.1. The Research Design and Methodology

3.1.1. The Research Method

Descriptive survey method was employed in this study with the assumption that it could enable the researcher to reveal the Challenges and Prospects of Internal Road Infrastructure Development: In the selected Kebeles of Yeka Sub-city Administration. Moreover, this method is appropriate because it helps in obtaining large variety of data related to the problem under the study. To this end, the following procedures of quantitative and qualitative (mixed method) research designs were employed to collect and analyze the data. Employing mixed approach enables the researcher to look from different perspectives and the context based practice from participants view. This method is chosen with the assumption that it helps to have data as it exists and to gather information related to the problem under study.

3.1.2. Sources of Data

Both primary and secondary sources of data were used, based on the above assumptions leader from community participation development agency, leaders from the Sub-City, leaders from the *Woredas,* Officers from Kebele administration, Officer from cobblestone project coordination office, some informants from pedestrian and some with cars and local development committee members as major sources of the primary data.

Other essential secondary sources included in this study were: relevant books, academic journals, proceedings, books, articles contributed by different authors, internet based information which contains relevant information related to the subject under the study.

3.1.3. Sample and Sampling Techniques

The total numbers of sub-cities in Addis Ababa are 10 (ten). From these sub-cities, the researcher interested in Yeka Sub-City,thatresearcher had the experience of in some parts of the localities.

Moreover, researcher has preferred to work on the cobblestone projects around Kebele 01 and Kebele 02 areas found in the sub-city. Hence, purposive sampling was employed in

the selection of Kebeles. The main reason behind this selection is the familiarity and convenient access of information relevant to the study.

A manageable sample size of 120 households is supposed to participate in this study by filling and responding to the survey questionnaire. They are identified with systematic random sampling technique. Out of them, 102 household responded to the questions willingly. Other informants for the interview were purely purposive.

3.1.4 Data Collection Instrument

Interview, observation and survey questionnaire were employed to collect data from respondents. The data was collected mainly from primary sources through Interview, observation and survey questionnaire which enables the researcher to gain genuine information.

3.1.5. Procedures of Data Collection

In order to gather the necessary data, a group of respondents were actively involved in the study and data collection instruments were developed by the researcher based leaders from the Kebele 01/02 administration on the review of related literatures. Officers from the Woredas, Officer from cobblestone project coordination office, and local development committee were treated through interview. The rationale behind these respondents is to consolidate the reliability of information.

3.1.6. Method of Data Analysis

The data collected through structured interview and observation checklist are used to supplement the quantitative data obtained from the residents. The quantitative data was organized and analyzed using SPSS version 20. Thus, descriptive statistics such as frequency counts andpercentage are computed. The quantitative data mainly involves one sample t-test to assess the respondents' agreement towards the statements presented in the questionnaire. Besides, the data gathered through interview and observation checklist were treated to enhance the findings in the data analysis. Finally, the researcher tried to enhance the reliability of the findings through discussion with the local development committee members.

CHAPTER FOUR

4. Analysis and Discussion of the Data

4.1. Introduction

The main focus of this research is to investigate the prospects and challenges of cobblestone roads in the selected Woreda/Kebeles. The study will then try to evaluate the benefits, challenges and community participation in such road infrastructure development in Yeka Sub city, Woreda 01 Kebele 01 and 02 areas.

To address the research objectives, data were collected from the community members using survey questionnaire, and interviews were conducted to different actors in cobblestone the road construction and maintenance projects. This chapter presents the data analysis of quantitative data obtained from the residents in the area, as well as qualitative interview responses from local committee members and Woreda administration officials. Moreover, observations in different cobblestone sites are also incorporated in the discussion.

The data analysis and presentation include: the assessment made on the quality of the roads in the eyes of the community, the benefits that the community achieved as a result of the roads, the challenges faced during and after the construction of the roads, the causes in the deterioration of the roads and the maintenance arrangement, the community participation and local government responsibility.

4.2. Quality of Cobblestone Roads

Construction quality will be largely dependent on the standard and frequency of technical support as well as detailed specification of elements, design and quality of consultant and contractor. The number of staff members in the field will be mostly determined by the regularity with which they must visit each site. It is imperative to assign the appropriate staff to monitor the quality of the construction (IFRC, 2012:90). Lack of adequate qualified technical staff can result in poor construction monitoring and low-quality infrastructure (ibid).

The quality of the road network affects almost everybody in daily life. Therefore users, residents, consumers, employees, businessmen or taxpayers, we all should care that roads are managed efficiently and are able to deliver good service to society (ERF, 2014:6). Due to lack of technical ability, the quality of the roads is assessed using the opinion of the community.

In order to assess the opinion of the villagers regarding the quality of the road, certain statements were presented to be rated by the respondents. These statements are related to the quality of the road that most people expected to be achieved.

The cobblestone roads, by its nature simply deteriorate or destruct unless constructed with quality, as the stability of one Cobblestone in its place depends on the stability of the other. If a single Cobblestone is displaced (scattered) from the normal position, there is a possibility for the whole Cobblestones to gradually displace. Hence, each single cobblestone is supposed to be well fixed in the ground, and can't be easily displaced. The average agreement level to this statement is M=2.75, which is below the moderate level (t-value=2.58, p-value=0.011<0.05). Hence, the road can be easily damaged with displaced stones from it. In this respect, the respondents has disagreed that the road lacks the required quality.

The edge or the end of the roads which has a connection with asphalt or earthen road can simply be destroyed unless strongly fixed with a cement or concrete. However, the respondents only moderately agreed, M=3.12, to the statement that the edges and sides of the road are strongly fixed with big concretes and cement. As a result, the roads are not meeting this standard to the expected high level. Moreover, the curve stones should also be properly erected, stuck or fixed by cement and other materials in order for it to hold the Cobbles.

If the joint area between the end of the Cobblestone roads and either asphalt or earthed road is not constructed with the help of big stone and cement, it will simply deteriorate and makes other Cobblestones to scatter, which is evidenced during my observation in the site visit of the roads. The rating by the respondents also asserts the lack of quality in some parts of the roads. They disagreed with M=2.61 that the road is segmented with

proper distance using concrete and cement; only car speed breakers are rarely applied that does not bring much difficulty for night walk. This was agreed only to the moderate level with M=3.04. I also observed in the field work or sitevisit, that the edges of paved road were not constructed to the required strength.

Statements that the road is level and doesn't hold water during "Kiremt", and Ditches and sewerage pipes are properly fixed are agreedby the respondents, above the moderate level with M= 3.38 and M=3.24 respectively. These assessment of the community implied that the roads were constructed with appropriate slope, where water flows directly to the ditches. The leveling of the roads also helped not to contain water for long time, which otherwise swipes out the sand and causes deterioration to the roads. However, it is observed that the ditches in the other side of the roads are not safe from the mud/dust or waste dumps.

This somehow created overflow of water/mud during "Kiremt" and may cause damage to the roads. This is supported by the respondents, that they disagreed, with M=2.65, to the statement that it is not easy to spoil the road with dusts from either side of the road. This is due to the lack of quality in the ditches that were not part of the road construction project. The ditches were constructed as part of the previous "care Stone" road, and in some areas they even get damaged during the new cobblestone road construction.

Table1: Residents view on the Quality of Cobblestone Road

	One-Sample Statistics			Test Value = 3					
								95% Confidence Interval of the Difference	
	N	Mean	Std. Deviation	t-value	df	p-value	Mean Difference	Lower	Upper
It is difficult to easily displace a single stone from the road	102	2.75	0.96	-2.58	101	.011	-0.25	-0.43	-0.06
The edges and sides of the road are strongly fixed with big concretes and cement	102	3.12	1.11	1.07	101	.287	0.12	-0.10	0.34
The road is segmented with proper distance using concrete and cement	102	2.61	0.79	-5.04	101	.000	-0.39	-0.55	-0.24
Car speed barkers are properly applied and don't create difficulty during night walk	102	3.04	1.00	0.39	101	.694	0.04	-0.16	0.24
The road is level and doesn't hold water during "Kiremt"	102	3.38	1.08	3.57	101	.001	0.38	0.17	0.59
Ditches and sewerage pipes are properly fixed	102	3.24	1.23	1.93	101	.056	0.24	-0.01	0.48
It is not easy to spoil the road with dusts from either side of the road	102	2.65	1.14	-3.13	101	.002	-0.35	-0.58	-0.13
The road adds for the beauty in the village	102	4.04	0.69	15.25	101	.000	1.04	0.90	1.17
The road helped to move around more easily more in vehicles and on foot	102	3.70	0.95	7.38	101	.000	0.70	0.51	0.88
Compared with the previous roads, the cobblestone is by far much better	102	3.82	1.05	7.94	101	.000	0.82	0.62	1.03
The road will serve several years with little maintenance	102	3.43	0.87	4.99	101	.000	0.43	0.26	0.60
The quality of the road is acceptable to the community	102	3.50	0.50	10.05	101	.000	0.50	0.40	0.60
The overall quality of the road is appreciable	102	3.24	0.75	3.18	101	.002	0.24	0.09	0.38
Road Quality	**102**	**3.25**	**0.54**	**4.70**	**101**	**.000**	**0.25**	**0.15**	**0.36**

Table1:Residents view on the Quality of Cobblestone Road

Source: own survey (2018)

The quality of the road is more attributed to the beauty of the villages; where respondents have relatively high level agreement, M=4.04, to the statement that the road adds for the beauty in the village. Moreover, an average high level agreement, M=3.70, is attributed to the statement that the road helped to move around more easily both in vehicles and on foot. Such high level quality rating was mainly due to the problems and difficulties the villagers' experienced using car in the previous roads; as well as the mud and watery roads during the "Kiremt" season. For this reason, Respondents strongly believed, M=3.82, that the cobblestone road is an improved infrastructure; and by far much better than the roads before. They also have considerably high level trust, M=3.43, that these roads will serve several years provided there is proper maintenance arrangement by the concerned parties.

The overall cobblestone road quality is computed to an average agreement level of 3.25, which is above a moderate level agreement (t-value=4.70, p-value=0.000<0.05). The overall quality is then within the 95% CI range of 3.15-3.36. In general, although there are some major limitations in the road, the overall quality of the road was found acceptable to the community.

4.3. Benefits of the Cobblestone Roads

Roads are one of the major community assets and provide large benefits to the society. Road improvements are believed to bring benefits to road users through improved access to hospitals, schools, and markets; improved comfort, speed, and safety; and lower vehicle operating costs. The roads are also expected in making urban clean and beautiful and above all they facilitate the overall service delivery.

It is obvious that Cobblestone road construction is playing a great role in bringing about social, economic and environmental benefits at the local and national level. The cobblestone construction projects are expected to bring various benefits to the community and villagers in the research area. In this research, therefore, the cobblestone roads are assessed for its benefits to the community; and presented in the table below.

One of such benefits is the comfort villagers enjoyed as the result of the cobblestone roads. In particular, the cobblestone roads have reduced villagers' challenges especially

during the Kiremt season, as well as walking in the night. Respondents agreed to the level M=3.99 that cobblestone roads reduced dust in dry seasons and mud during rainy season. In addition, other significant benefit of the road is providing safe walk way even during the night, which is agreed to the level M= 3.56.

Agreed to the level M=3.32, the cobblestone road is also providing easier access to trucks providing supplies: such as charcoal truck, pit latrine emptier. Similar benefit of the road providing improved access to Ambulance, rented taxi, house car, school bus, etc. Wasagreed to the level M=3.44 by the respondents. Among others the newly constructed cobblestone roads adds to the beauty and sanitation in the villages. This was strongly agreed by the respondents with M=3.80 average level of agreement. However, these benefits of the road may be suffered from some improper ditches and waste dumps and sewerages from some members of the society.

Moreover, the respondents positively agreed that the status of the village for living is now significantly improved. Some informants also expressed the economic viability of the village as they enjoy better house renting potential. Even children found the road as safer playing ground. This is an emerging benefit of the cobblestone road that children found playing field (ex: soccer, cycling). An agreement level of M=3.64 assured the benefit of the cobblestone for children in the villages.

Although the respondents did not have strong agreement to some of the statements (such as; Villages are better connected with the roads, Villages become more economically viable places, and Provide experience for other similar works;)these benefits were not denied at all . Such benefits of the cobblestone are believed to have been enjoyed to the moderate level.

Table 2: The Benefits of Cobblestone Roads

	One-Sample Statistics			Test Value = 3					
								95% Confidence Interval of the Difference	
	N	Mean	Std. Deviation	t-value	df	p-value	Mean Difference	Lower	Upper
Villages are better connected with the roads	102	3.02	0.69	0.29	101	.774	0.02	-0.12	0.15
Villages become more economically viable places	102	3.11	0.94	1.15	101	.251	0.11	-0.08	0.29
Provide safe walk way even during the night	102	3.56	0.50	11.31	101	.000	0.56	0.46	0.66
Reduced dust in dry seasons and mud during rainy season	102	3.99	0.72	13.81	101	.000	0.99	0.85	1.13
Provide easier access to trucks providing supplies: ex charcoal truck, pit latrine emptier	102	3.32	0.47	6.95	101	.000	0.32	0.23	0.42
Improved access to Ambulance, rented taxi, house car, school bus, etc.	102	3.44	0.85	5.24	101	.000	0.44	0.27	0.61
Children found playing field (ex: soccer, cycling)	102	3.64	1.05	6.12	101	.000	0.64	0.43	0.84
Adds to the beauty and sanitation in the villages	102	3.80	0.81	10.04	101	.000	0.80	0.65	0.96
Provide experience for other similar works	102	3.05	0.55	0.90	101	.372	0.05	-0.06	0.16
Improved status of the village for living	102	3.42	0.81	5.23	101	.000	0.42	0.26	0.58
Road benefits	**102**	**3.44**	**0.59**	**7.47**	**101**	**.000**	**0.44**	**0.32**	**0.55**

Source: own survey (2018)

The overall benefits of the cobblestone the rated with aggregated level of M=3.44, which is significantly above the moderate level (t-value=7.47, p-value=0.000<0.05). The 95% CI of the significance of the cobblestone roads is in the range 3.32-3.55. Hence, the community has acknowledged and enjoyed the benefits of the road.

4.4. Problems affecting the cobblestone Roads

According to the respondents, the cobblestone roads are found to have met certain quality standards, and benefited the community in various ways. However, the community, and the government officials, has the feeling that these quality and benefits may not lost very long due to certain problems observed in connection with the roads.

To assess these problems, Respondents were presented with common problems that are affecting the road and ultimately damage the road. Among others, utility access construction, such as water pipes and sewerage pipes are some of the reasons damaging the roads. This is the most significant problem that the respondents agreed to the level M=3.83. Such maintenance of water pipes and sewerage lines can't be done without first dismantling the cobblestone. But the reconstruction/maintenance of the road by the responsible individual resulted in poor road maintenance, hence poorer quality. This situation was used captured during site visit.

Another significant problem observed was improper ditches /resulted in water or mud overflow to the roads/. This is also highly agreed by the respondents to the level M=3.55. In addition, Improper waste dumps is believed to have posed moderate level, M=3.16, problem to the roads.

There are other problems that have relatively very low impact/damage to the cobblestone roads. These are Electric and telecommunication poles, Very heavy trucks – loaded with construction materials, and the landscape of the road areas. Such problems are disagreed as they are not believed to have imposed considerable damage to the roads. However, these could be potential threat to the cobblestone in the upcoming future.

Table 3: Problems Affecting Cobblestone Roads

	One-Sample Statistics			Test Value = 3					
								95% Confidence Interval of the Difference	
	N	Mean	Std. Deviation	t-value	df	p-value	Mean Difference	Lower	Upper
Utility access construction such as water pipes and sewerage pipes	102	3.83	0.61	13.69	101	.000	0.83	0.71	0.95
electric and telecommunication poles	102	2.69	1.10	-2.88	101	.005	-0.31	-0.53	-0.10
Improper ditches /resulted in water or mud overflow to the roads/	102	3.55	1.03	5.38	101	.000	0.55	0.35	0.75
Very heavy trucks – loaded with construction materials	102	2.75	1.05	-2.45	101	.016	-0.25	-0.46	-0.05
Improper waste dumps	102	3.16	1.20	1.32	101	.190	0.16	-0.08	0.39
The landscape of major road projects	102	2.75	0.99	-2.50	101	.014	-0.25	-0.44	-0.05
Road Damages	**102**	**3.12**	**0.64**	**1.92**	**101**	**.058**	**0.12**	**0.00**	**0.25**

Source: own survey (2018)

During the site visit,researcher have observed that the already cobblestone roads were dismantled by the water and sewerage authority for improved water pipes. This was arranged with the Kebele authority and committee, and the authority will pay some sum amount for reconstruction of the road. Unless maintained quickly, the damage on the roads may aggravate. The community does not havetrustthat these roads are going to be maintained soon with the desired quality.

The overall damage to the roads amounted to the moderate level, M=3.12. This indicates the need to address very common problems.

4.5. Management of the Road Construction

In order to assess the efficiency and effectiveness of managing the construction project, respondents' opinions were evaluated as in the table below. Mainly, the road construction projects were managed and supervised by the local government authority. This authority was responsible for initiating, planning and executing the cobblestone

projects. Hence, the success or failure of the road construction project rests on the efforts made by the staff from the local authority.

Respondents rated their agreement to the statement that staff of the administration has the required expertise in mobilizing the community. They have rated with average agreement level of M=3.38, which is significantly above moderate level agreement. This indicated that the administrative representatives are believed to have considerably acceptable experience for the project. The administrative authority has, in addition to allotting budget for the road works, addressed the need for improved road infrastructure in the community. For this effort, the community has honored the authority, with an average agreement level of M=3.32.

Table 4: Effectiveness of Cobblestone Road

	One-Sample Statistics			Test Value = 3					
								95% Confidence Interval of the Difference	
	N	Mean	Std. Deviation	t-value	df	p-value	Mean Difference	Lower	Upper
road projects are according to the plan	102	2.78	1.16	-1.88	101	.063	-0.22	-0.44	0.01
The projects are completed within time and budget	102	2.42	0.86	-6.79	101	.000	-0.58	-0.75	-0.41
The management effectively coordinate all actors	102	2.75	0.53	-4.63	101	.000	-0.25	-0.35	-0.14
Employees of the administration has the required expertise in mobilizing the community	102	3.38	0.49	7.91	101	.000	0.38	0.29	0.48
There is road maintenance arrangement	102	2.88	0.76	-1.56	101	.122	-0.12	-0.27	0.03
The administration is honored by the community	102	3.32	0.47	6.95	101	.000	0.32	0.23	0.42
Road Management	**102**	**2.92**	**0.48**	**-1.59**	**101**	**.115**	**-0.08**	**-0.17**	**0.02**

Source: own survey (2018)

The respondents however, showed reservation on agreeing to the statements that road projects are according to the plan, there was road maintenance arrangement, and the

management effectively coordinate all actors. These statements are agreed only to the moderate level with M= 2.78, M=2.88, and M=2.75 respectively. Respondents also disagreed that the projects were completed within time and budget by M=2.42 average level. Rating overall the management by the local administration is rated with M=2.92, which is a moderate level agreement in the range 2.83-3.02.

4.6. Challenges during the Road Construction

The cobblestone projects are not believed to be an easy going endeavors to all stakeholders participated. The projects may not come up with its completions without some sort of pitfalls that could compromise the road quality and has effect in timely and within budget handover of the newly roads. Some of the challenges raised to the respondents are presented and evaluated in the table below.

Among the list of challenges, financial limitation in the road construction was believed to be the most challenging with average rating of M=3.70,indicating a high level challenge within the 95% CI in the range 3.47-3.92. In relation to the financial limitation, the 2nd most challenging activity was the timely collection of community contribution. The slow rate of raising fund by the community was a challenge with M=3.39 average level of agreement. Inactive participation of the community was also a considerably high level challenge with M=3.22 agreement level by the household respondents.

Poor project management and coordination, and lack of community sense of ownership are believed to have excreted a moderate level challenge on the road construction project with M=3.05 and m=M=3.14 respective agreement level by the respondents.

Table 5: Challenges Faced in Cobblestone Projects

	One-Sample Statistics			Test Value = 3					
								95% Confidence Interval of the Difference	
	N	Mean	Std. Deviation	t-value	df	p-value	Mean Difference	Lower	Upper
Financial limitations	102	3.70	1.15	6.11	101	.000	0.70	0.47	0.92
Inactive participation of the community	102	3.22	0.74	2.95	101	.004	0.22	0.07	0.36
Poor project management and coordination	102	3.14	0.89	1.56	101	.123	0.14	-0.04	0.31
Lack of ownership by the community	102	3.05	1.01	0.49	101	.625	0.05	-0.15	0.25
Improper prioritization of each access roads	102	2.41	0.81	-7.31	101	.000	-0.59	-0.75	-0.43
Landscape of the locality	102	2.72	0.45	-6.33	101	.000	-0.28	-0.37	-0.20
Improper time/season of road construction	102	2.60	1.05	-3.88	101	.000	-0.40	-0.61	-0.20
Removing previous road materials	102	2.80	0.90	-2.20	101	.030	-0.20	-0.37	-0.02
Theft of construction materials	102	1.57	0.50	-29.05	101	.000	-1.43	-1.53	-1.33
Recruiting volunteer local committee member	102	2.66	0.79	-4.39	101	.000	-0.34	-0.50	-0.19
Lack of trust in officials managing finance	102	2.76	0.43	-5.57	101	.000	-0.24	-0.32	-0.15
Absence of prior community awareness	102	2.76	0.98	-2.43	101	.017	-0.24	-0.43	-0.04
Setting equitable contribution by families	102	2.65	0.59	-6.03	101	.000	-0.35	-0.47	-0.24
Timely collection of community contribution	102	3.39	0.92	4.28	101	.000	0.39	0.21	0.57
Conflict with the Addis Ababa City road master plan	102	2.42	1.06	-5.53	101	.000	-0.58	-0.79	-0.37
Road Challenges	**102**	**2.79**	**0.16**	**-12.94**	**101**	**.000**	**-0.21**	**-0.24**	**-0.18**

Table 5: Challenges Faced in Cobblestone Projects

Source: own survey (2018)

Other challenges such as absence of prior community awareness, improper time/season of road construction, removing previous road materials, theft of construction materials, Recruiting volunteer local committee member, and lack of trust in officials managing finance were not considered as major source of challenge during the road construction.

As a result, the overall road construction challenges were not considerably high as the aggregate level of challenge in the coble stone construction were agreed to the average level M=2.79 which is significantly below the moderate level of challenge.

Although the overall challenges faced were to the level low, the community stressed the financial challenges.

4.7. Community Participation in the Road Construction

Local development projects carried out with the participation of the community have a profound importance to make its members closer to each other and work together for a common purpose. The role and participation of the community, as a stakeholder, is crucial in an inclusive road infrastructure development. In such local development activity it is believed that the community should participate actively as they are the first beneficiary of the outcome and to make them develop a sense of ownership to preserve, manage and maintain the development outcomes without expecting the government for any budget allocation to such activities. Thus, the communities are expected to participate in contributing money and in kind (financially and operationally) for the construction of the sub-base of the roads, collaborated in all aspects with the contractors or enterprises contracting for construction of the sub-base and/or pavement of the Cobblestones.

The road construction projects assume active participation of the community without whom the projects couldn't be realized effectively. Among others, the community is supposed to raise initial funds in the form of contribution from each household in the nearby community. Their participation was also demanded during the meetings with local officials and committee members. Above all the community members are supposed to exert efforts in the follow up of the road construction projects and protect the road from any sort of damages. In order to assess the level of the community participation,

respondents were asked certain questions and rate their agreements to the statements (shown in the table below).

The one-sample t-test performed to assess the level of community participation is depicted in the table below. The first statement is to assess the voluntary participation of the community members. On average, the agreement level as to the voluntary participation by the community was evaluated to the level M=2.74. As the t-value=3.73 and p-value=0.000< 0.05 indicates, the average agreement level was below the moderate agreement level (i.e. 3.00) indicating the disagreement to the voluntary community participation. Some of the residents and the experience that there were few members turn out in the meetings conducted to raise awareness and exchange of ideas.

During the road construction projects, the community opinion, knowledge, experience, expertise, and labor were not adequately invested in the projects. For this statement, the average level of agreement by the respondents is M=2.65, which is a disagreement to the statement in the 95% CI range of 2.50-2.79. Asked for the feeling of ownership by the community, the average agreement level M=2.78 is a moderate level agreement that the community has the sense of ownership. The community has only moderate level agreement, M=3.01, that they are willing to participate in similar projects in the future. That is their participation was half-hearted expecting the government being the sole care taker of such projects.

The community also lacks to highly appreciate the efforts by the local committee members. They only agreed to the level M=2.97 that they honored the local committees. If they do not take more seriously ,few members believed that committee members have some sort of partiality in setting the amount each household have to contribute to the project.

Table 6: Assessment of Community Participation

	One-Sample Statistics			Test Value = 3					
								95% Confidence Interval of the Difference	
	N	Mean	Std. Deviation	t-value	df	p-value	Mean Difference	Lower	Upper
The community participated voluntarily	102	2.74	0.72	-3.73	101	.000	-0.26	-0.41	-0.12
The community was highly participated	102	2.74	0.72	-3.73	101	.000	-0.26	-0.41	-0.12
The community opinion, knowledge, experience, expertise, and labor were adequately invested in the projects	102	2.65	0.74	-4.82	101	.000	-0.35	-0.50	-0.21
The community has sense of ownership	102	2.78	1.26	-1.73	101	.086	-0.22	-0.46	0.03
The community will positively engaged in similar projects in the future	102	3.01	0.93	0.11	101	.915	0.01	-0.17	0.19
The local committee members are honored by the community	102	2.97	1.00	-0.30	101	.767	-0.03	-0.23	0.17
The community participates in the maintenance of damaged part of the road	102	2.38	1.01	-6.20	101	.000	-0.62	-0.82	-0.42
There is a sense of accountability not for causing damage in the roads	102	2.27	0.96	-7.66	101	.000	-0.73	-0.91	-0.54
The financial contribution by the community are fairly enough	102	2.86	0.91	-1.52	101	.132	-0.14	-0.32	0.04
The community participated voluntarily	102	2.59	0.63	-6.55	101	.000	-0.41	-0.54	-0.29
Community Participation	**102**	**2.70**	**0.57**	**-5.30**	**101**	**.000**	**-0.30**	**-0.41**	**-0.19**

Source: own survey (2018)

Asked for their participation in the maintenance of damaged roads, the community has disagreed to the rating level of M=2.38, which is far below the moderate level agreement rating. This indicates that the community has a minimal or no role to fix roads' damage. The community also observed absence of the sense of accountability to safe keep the newly constructed cobblestone roads from any sort of damage. For this statement of

accountability, the respondents average rating, M=2.27, shows lake of responsibility in the community.However, one is subject to maintain the road he/she damaged for some reason that was priory informed and accepted by the local committee.

The community is one of the financial sources for the road construction. This financial contribution is the most visible means of community participation. The respondents evaluation on the community's financial contribution is believed to be a moderate level with average agreement rating of M=2.89, which lies within the 95% CI range of 2.68-3.04.

Overall, the average rating for the community participation in the cobblestone road construction project is M=2.70 with 95% CI ranging in 2.59-2.81. This is significantly below the moderate level agreement (t-value =5.30, p-value =0.000<0.05) indicating that the community participation in the construction and maintenance of the roads was a low level participation.

The low level responsibility was amounted to some unidentified members in the community that may throw dumps in the roads.

4.8. Summary of responses to the Interviews

In order to supplement the qualitative data/ analysis an interview was conducted with Kebele 01/02, Officer for cobblestone projects and local development committee members. Based on the items raised to the interview participants the following summarized findings were explained accordingly.

Question # one: The overall current status of the cobblestone roads in the administration area.

> *Cobblestone road construction in Yeka Sub-city is relatively in a good status and it is a project aimed at creating job opportunity to the youths and makes the part of the Sub-cities clean and beautiful with Cobblestone at a very lower cost than asphalt. Otherwise, the Cobblestone roads is becoming badly managed*

and deteriorated within some few years before serving the users effectively.

In our locality, majority of the previous roads are replaced by cobblestone.

The remaining roads will be maintained within a year. However, these new roads need to be protected damage that the community needs to actively participate to safe keep the roads and maintain the roads in time.

Question # Two: The general effect that the cobblestone roads have on the administration areas.

Cobblestone is becoming in practices since 2005.It was for a dual effort to create job opportunities for youth, and to provide attractive and long-lasting road and pavement to community.

Furthermore, Cobblestone paved streets solve social and economic problems of the community, creates awareness on community participation; better community-government relations.

Question # Three: The priority of services given by the roads users.

Quite often some of the villages were not easily accessible in case of emergencies like fire or accidents, which hamper social and economic development as for example trucks providing supplies, charcoal truck, pit latrine emptier and waste collection trucks. These problems are now eased that villagers can contract transportation services to reach their homes.

Question #Four: What will be the future fate of the roads, who is responsible to own the roads, and to which particular body can we report for any event on the roads?

It is very important to preserve the existing cobblestone roads which could be deteriorated because of different reasons.

The roads are the outcomes of the efforts who were directly or indirectly involved in the construction. However, the community has to own the roads and need to actively engage in the maintenance of the roads. In case of some major incidents on the road, the community shall report to the local development committee. This is supposed to take proper action.

Question #Five: What are the main problems observed in the overall situations, what should be the corrective actions taken and what preconditions are needed to sustainably use these roads?

The most common problem is neglecting the maintenance aspect. After building new roads at a very high cost (money) and leaving them without maintenance obviously makes them to deteriorate very quickly. Maintenance is required to be carried out from time to time to restore its condition; if maintenance is not carried out the road will continue to deteriorate making passage increasingly difficult, uncomfortable and expensive to road users.

4.9. Ongoing cobblestone projects

In around the selected Kebeles, there are also new road projects underway.These projects came after researcher write up mainly considering the completed projects. In search of additional information, researcher have assessed the paving of these roads and discussed with the villagers the pavement works have started.Researcher have made observation to this new project sites, and had the chance to talk to some of the committee members, as well as the contractors. The following points are worth mentioned:

- ✓ People were constructing a stone-wall to protect cobblestone from soil dumps.

- ✓ People were coming out in group to discuss issues with the committee members, as well as the contractors. The residents were actively involved in the sites, commenting on the pavement.
- ✓ Unlike the previous cobblestones project experiences around the Kebele, this new project will include the construction /improvement of the existing ditches.
- ✓ Before the pavement of the roads, the community were instructed to replace their water-pipes with plastic tubes, and make the necessarily drainage system that cannot be entertained after the project had started and completed.
- ✓ Water infrastructure development work by the respective authority had interrupted the projectonce the pavement started.
- ✓ The landscape of this particular site is subjected to damage due to dusts from either side. However, the project may not include protection wall, which otherwise could damage the road easily.
- ✓ The erections of electric poles were started in the villages. But there are several poles to be erected deep into the village. This task will come after the construction of the roads. Hence, a possible damage is anticipated.

CHAPTER FIVE

5. Summary of the Findings, Conclusions and Recommendations

This chapter deals with the summary of the findings and conclusions driven from the interview and data analysis of the study; and forwards the recommendations on the basis of the findings of the study.

5.1. Summary of the Findings

The purpose of this study is to assess the overall opportunities and challenges of Cobblestone roads in relation to their management, maintenance, and community participation. Moreover the study attempted to assess the quality of the roads and the benefits enjoyed by the community of the selected areas in Yeka Sub City. In addition, this paper aims exploring the factors that affect the roads, and forward the recommendations what has to be done next in order to solve the problems observed and bridge the gap on this particular issue.

Infrastructures development is very essential for any area to bring about an overall development in all aspects and especially to change the lifestyle of the people. These infrastructures can bring about rapid economic growth; a social and cultural attitudinal change and in general facilitate the service delivery process for the people.

One of the urban infrastructures is the Cobblestone roads which are being constructed under the Urban Local Government Development Program (ULGDP). Cobblestone roads development is one of the local urban developments that is being constructed by the participation of the community and the government in Addis Ababa in general and in Yeka Sub-City in particular.

Unlike earlier times, the community has started asking for the cobblestone infrastructure development that is now common in various places in Addis Ababa. As one form of participation, the community is expected to raise funds, in the form of contribution, up to the completion of the sub base construction; while the rest activities of the road construction is the responsibility contributed by the government. Financially, the community participation is in construction of the sub-base and the government in the pavement of the Cobblestone roads.

The fund raised from the community was conducted through the local committee, who had experienced uneasy job. The findings suggested that, to collect the fund from the community

were time taking effort to the committee in charge that entails lack of active participation from the villagers, and believed to have unwanted impact in the project timing. The responses in the survey, moreover, entailed that the community opinion, knowledge, experience, expertise, and labor were not explored and adequately invested in the projects. The low level participation, in most cases, was resulted from the community's understanding in putting the government as sole responsible to such undertaking. In some cases, people think the realization of such projects could serve as government propaganda to win the hearts of many during election periods. Such misconception reported by informants refrained the community for heartfelt engagement in the project trying to reveal their discomfort in the political situation. In general the community participation was low level; and their sense of ownership was as low as their level of participation.

The Cobblestone roads that are being constructed around the selected Kebeles are bringing about many positive changes, which benefited the community in many ways. According to the ratings by the respondents living in the nearby roads, the community has started enjoying several benefits in contrast to the difficulties and problems they had faced before having the cobblestone roads. The cobblestone roads have reduced villagers' challenges especially during the Kiremt season, as well as walking in the night. Among others the newly constructed cobblestone roads adds to the beauty and sanitation in the villages. Moreover, the respondents have positively agreed that the status of the village for living is now significantly improved. Even children found the road as safer playing ground, which is an emerging benefit of the cobblestone road that children found playing field (ex: soccer, cycling). The roads also facilitate the service delivery, and above all these roads are making the urban or city very clean and beautiful.

However, these benefits of the road may be suffered from some improper ditches and sometimes dumps and sewerages that results from the carelessness from some members of the society. The major damage to these roads was the construction of water/sewerage pipes, and water or mud overflow to the roads, and improper ditches in some areas. Not only individuals, but government organizations, namely water/sewerage authority and EELPA (Ethiopian Electric and Power Authority), are making/maintaining their respective infrastructure development activity, which impacted the already newly constructed cobblestone roads, Although Water and Electricity infrastructures are also highly demanded by the community, however, such uncoordinated infrastructure development projects have

caused heavy damage to the roads; and resulted in multiple costs with deteriorated road quality.

In most cases, the maintenance of the roads was not up to the original quality and strength of the roads. Even, the road maintenance arrangement is vague and without clear roles and responsibilities to the stakeholders to safe keeps the roads from damage. The response from the government officials during the interview also shows that even though managing and maintaining of these roads is necessary, there is not any manual, and budget, how to manage, maintain and treat the roads. In some cases, the road user who brings damage in the roads is subjected to its maintenance, with additional fines. The maintained part of the roads is clearly distinguishable by its poorer quality than its surrounding areas.

Due to the absence of clear maintenance guidelines the community could not develop a sense of ownership to manage and maintain the roads though they showed their commitment towards protecting the roads. The community to some extent taking measures on hindering the movement of trucks along these roads as well as, pointing to those who caused some sort of damage to the roads. In general, the main focus was simply on the construction to have local cobblestone road access in order to solve problems but disregarding the future potential maintenance need.

5.2. Conclusions

This study focused on the challenges and opportunities in the construction, management and maintenance of Cobblestone road, and assessed the quality of the road as well as the community participation. The findings show that the quality of the cobblestone roads is in its acceptable standard to the community, and they achieved several benefits. The cobblestone roads add to the beauty of the villages; and the villages became economically viable for house owners as well as to those who seek rented houses. The benefits include access to taxi, ambulances, and school buses. Generally there is a huge benefit of the roads to the community investment in the cobblestone roads.

The Cobblestone roads have also impact on the overall social, cultural and attitudinal change. With all direct benefits enjoyed by the community, however, the road projects do not have increased the understanding and awareness of the community towards local development. There is the tendency of the community to push the responsibility to the government while their participation mainly limited to their financial contribution for the pavement work. Few volunteers serve as committee members; while the majority's skill and knowledge were not

utilized. Moreover, the project organizers from the government side did not provide adequate orientation to mobilize the community. In general, although the community demanded the cobblestone roads, their direct engagement and participation were not up to the expectation of most villagers. The government did not create a smooth space and have a regulation to make the community and other actors to fully participate.

It is also observed that the roads quality is threatened by certain challenges both from community members as well as uncoordinated government infrastructure development efforts, especially water pipes constriction. Individual households, who need to renew their water line, are supposed to get the permission by the committee that allows them to dismantle the cobblestone. However, the reconstruction of the damaged roads (done by the unskilled individual) usually ends up in its poorest quality; where the committees are not supposed to take proper action.

The constriction of water pipes, for improved access to potable water, by the Water and Sewerage Authority comes after these roads were built. But this demand for improved water pipes resulted in severely damaged roads quality; although the authority funded the reconstruction of the roads. Uncoordinated efforts by different government organizations will therefore resulted in cost duplication; which resulted in poorly maintained roads. This is the result of lack of follow up in the maintenance of the roads by the committee as well as the government.

The community sense of ownership was low, but has improved after certain damages were realized in the roads; and tried to control some causes that could damage the roads. Due to lack of clear road management and maintenance arrangement by the government, however, the community could not push their effort, and unable to account those who caused the damage. But keeping the community as central actor is important even though the key role is up to the government. It has also to be recognized that the sustainability of the roads is difficult without the full participation of the community.

The community believed that the cobblestone roads are economical and hoped the roads will serve several years. The demand for cobblestone roads by the community and their financial contribution are grand opportunity to the development of cobblestone roads. The benefits obtained has improved the sense of ownership by the community, which is also an opportunity to safe keep the roads. However, cobblestone projects are faced with several challenges that they are being damaged by individuals and other government organs in the effort to water infrastructure development. The maintenance of affected roads also felt short

of quality they had before; which resulted lack of clear maintenance guideline that depicted the roles and responsibilities among different stakeholders.

5.3. Recommendations

Taking in to consideration all the findings, the analysis and the conclusion drawn, the following points were made as recommendations:-

- Focus on the construction and maintenance of some parts of the roads such as drainage to save the existing roads to minimize the cost of future maintenance.
- The government has to work more in raising awareness to make the community to actively participate on the construction of the roads; and also provide space and opportunity to the community and other stakeholders to participate fully in preserving, managing and maintaining the roads; as well as the community to evaluate and monitor the roads.
- Develop the sense of community ownership in order to preserve, manage and maintain the development outcomes without expectations to the government or each other.
- Directives or provisions that guide how to use the Cobblestone roads should be in place as a legal framework or as a policy in order to save the roads from being deteriorated by any huge vehicles with very high load. Put/erect Traffic Sign Posts to disallow heavy loaded trucks using the roads.
- The government should take full responsibility to take any measure on the roads with representatives from the community or set up task force to manage and maintain the roads.

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APPENDIX A1

I. Basic information of the Respondent

1. Woreda: _____ Kebele: _____ Ketena: _____
2. In your locality:
   a. Most of the roads are cobblestone Yes
      No
   b. Most of the existing roads needs to be replaced with cobblestone Yes
      No
3. Do you think cobblestone roads are cost-effective Yes
   No
4. Do you think cobblestone roads serve for several years in the future Yes
   No
5. Do you think the usage of these roads must be regulated by law Yes
   No

II. Quality of the Cobblestone Roads

Rate your agreement to the quality of the roads with the scale: 1=Strongly Disagree, 2= Disagree, 3=Neutral, 4=Agree, 5=. Please indicate your rating by putting the mark "X" considering yours as well as the opinion in your community.

No	Statement of Quality	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	It is difficult to easily displace a single stone from the road					
2	The size and shape of the stones adds the strength of the road					
3	The edges and sides of the road are strongly fixed with big concretes and cement					
4	The road is segmented with proper distance using concrete and cement					
5	Car speed barkers are properly applied and don't create difficulty during night walk					
6	The road is level and doesn't hold water during "Kiremt"					
7	Ditches and sewerage pipes are properly fixed					
8	It is not easy to spoil the road with dusts from either side of the road					
9	The road adds for the beauty in the village					
10	The road helped to move around more easily more in vehicles and on foot					
11	Compared with the previous roads, the cobblestone is by far much better					
12	The road will serve several years with little maintenance					
The overall quality of the road is appreciable						

III. Benefits of the Cobblestone Roads

Rate the benefits that your community enjoyed out of the cobblestone roads with the scale: 1=Very Low, 2= Low, 3=Average, 4=High, 5=Very High. Please indicate your rating by putting the mark "X"

No	Statement of Benefits	Very Low	Low	Average	High	Very High
1	Villages are better connected with the roads					
2	Villages become more economically viable places					
3	Provide safe walk way even during the night					
4	Reduced dust in dry seasons and mud during rainy season					
5	Provide easier access to trucks providing supplies: ex charcoal truck, pit latrine emptier					
6	Improved access to Ambulance, rented taxi, house car, school bus, etc.					
7	Children found playing field (ex: soccer, cycling)					
8	Adds to the beauty and sanitation in the villages					
9	Provide experience for other similar works					
10	Improved status of the village for living					
Please state other significant benefits:						

considering yours as well as the opinion in your community.

IV. Factors that pose damage to the Cobblestone Roads

Rate the significance of the factors damaging the cobblestone roads in your locality with the scale: 1=Very Low, 2= Low, 3=Average, 4=High, 5=Very High. Please indicate your rating by putting the mark

No	Factors damaging the roads	Very Low	Low	Average	High	Very High
1	Utility access construction such as water pipes and sewerage pipes					
2	Eclectic and telecommunication poles					
3	Improper ditches /resulted in water or mud overflow to the roads/					
4	Very heavy trucks – loaded with construction materials					
5	Improper waste dumps					
6	The landscape of major road projects					
Please state other significant factors that could damage the roads:						

"X" considering yours as well as the opinion in your community.

V. Management Competency of the Local Government (Kebele/Woreda Administration)

The management by the local administration is the main actor in the cobblestone projects. In your view (the view of the community) how do you rate the competency and effectiveness of the Kebele/Woreda administration?

No	Management competency	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	road projects are according to the plan					
2	The projects are completed within time and budget					
3	The management effectively coordinate all actors					
4	Employees of the administration has the required expertise in mobilizing the community					
5	There is road maintenance arrangement					
6	The administration is honored by the community					
7						
Please state any limitations about the Kebele/Woreda administration:						

VI. Challenges during the Cobblestone Roads construction

Rate the challenges observed during the cobblestone roads project in your locality with the scale: 1=Very Low, 2= Low, 3=Average, 4=High, 5=Very High. Please indicate your rating by putting the mark "X" considering yours as well as the opinion in your community.

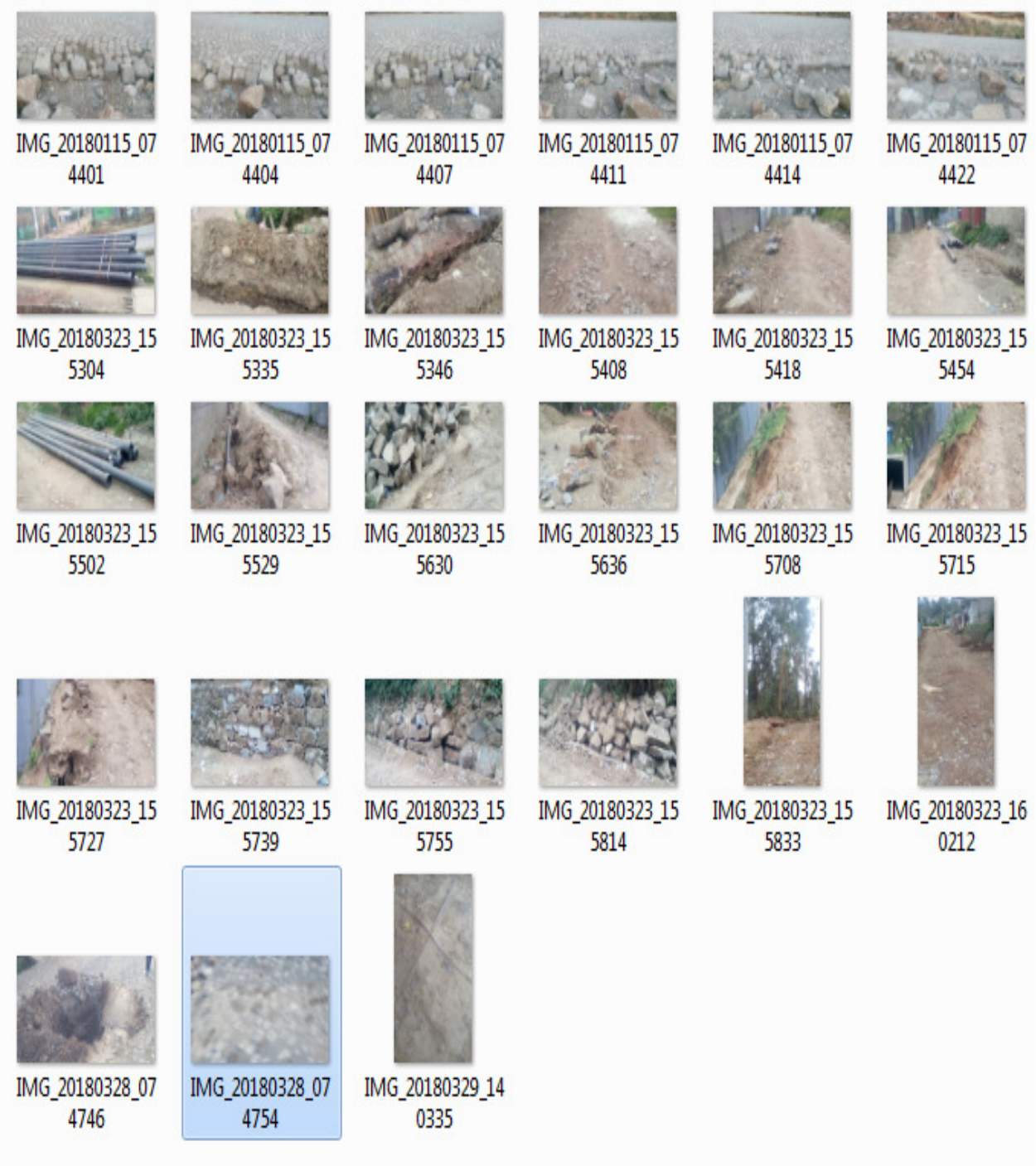
No	Challenges during road construction	Very Low	Low	Average	High	Very High
1	Financial limitations					
2	Inactive participation of the community					
3	Poor project management and coordination					
4	Lack of ownership by the community					
5	Improper prioritization of each access roads					
6	Landscape of the locality					
7	Improper time/season of road construction					
8	Removing previous road materials					
9	Theft of construction materials					
10	Recruiting volunteer local committee member					
11	Lack of trust in officials managing finance					
12	Absence of prior community awareness					
13	Setting equitable contribution by families					
14	Timely collection of community contribution					
15	Conflict with the Addis Ababa City road master plan					
Please state other significant challenges faced during the road construction:						

VII. Community Participation in the Cobblestone Roads construction Projects

Rate the community participation level during the cobblestone roads project in your locality with the scale: 1=Very Low, 2= Low, 3=Average, 4=High, 5=Very High. Please indicate your rating by putting the mark "X" considering yours as well as the opinion in your community.

No	Kinds of community participation	Very Low	Low	Average	High	Very High
1	The community participated voluntarily					
2	The community was highly participated					
3	The community has raised adequate financing					
4	The community opinion, knowledge, experience, expertise, and labor were adequately invested in the projects					
5	The community has sense of ownership					
6	The community will positively engaged in similar projects in the future					
7	The local committee members are honored by the community					
8	The community participates in the maintenance of damaged part of the road					
9	There is a sense of accountability not for causing damage in the roads					
10	The financial contribution by the community are fairly enough					
In your view what are the problems/challenges observed in the community not to actively participate in the road projects:						

APPENDIX B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Declaration

I, the under signed, declare that this thesis is my original work and that all sources used for the thesis have been duly acknowledged.

Name: Solomon Dejenie Aragaw

Signature: _____

Date: _____

This thesis has been submitted for examination with my approval as an academic advisor.

Name: Elias. B (Ph.D.)

Signature: _____

Date: _____