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COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

ENVIRONMENTAL AND SOCIAL EFFECTS OF ROAD CONSTRUCTION PROJECTS ON THE LIVELIHOOD OF LOCAL COMMUNITY: A CASE ON MIZAN - DIMA ROAD CONSTRUCTION PROJECT

MA THESIS SUBMITTED AS A PARTIAL FULFILLMENT OF THE REQUIREMENTS TO THE AWARD OF THE MASTER OF ARTS DEGREE IN ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

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Advisor's Approval Sheet

As Thesis Research advisor, I hereby certify that I have read and evaluated this thesis prepared, under my guidance, by Segni Dadi entitled Environmental and Social Effects of Road Construction projects on the livelihood of local community: A Case on Mizan - Dima Road construction project. I recommend that it is to be submitted as fulfilling the Thesis requirement.

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Declaration

All written materials in Thesis research work are researcher's original work, except those materials which was used for the referenced citations in the text.

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ACRONYMS

AfDB - Africa Development Bank

EA- Environmental Assessment

EIA - Environmental Impact Assessment

EPA - Environmental Protection Agency

ESIA- Environmental and Social Impact Assessment

ERA - Ethiopian Roads Authority

FGD- Focus Group Discussion

IFC- International Finance Corporation

MoFED- Ministry of Finance and Economic Development

OECD- Organization for Economic Cooperation and Development

PAP- Project Affected Person

PAH- Project Affected Household

SEA- Social and Environmental Assessment

RSDP- Road Sector Development Programme

SIA- Social Impact Assessment

SNNP- Southern Nation Nationalities and People

Contents

List of Figures

List of Tables

ABSTRACT

This study is aimed to assess the environmental and social impacts, evaluate the project implementation and its barriers of implementation of the developmental projects on the livelihood of local community taking Mizan-Dima road construction project. Mixed methods designs which include both qualitative and quantitative were used. The participants of the study were household heads of project affected communities, the road construction project staff of Mizan-Dima Road construction project site. Purposively selected road section was taken from project stretch and all households from selected section were participated in the study. In order to collect the data the researcher developed survey questionnaire, semi structured interview, focused group discussion guiding questions. Secondary data were also included. Most of the participants were suggested that the road construction project has positive impacts in enhancing economic or livelihoods activities of the local communities'. Another majority of the participants reported the road construction has caused soil erosion, environmental pollutions and faunas and floras disruption. Meanwhile, adverse impacts from project's selected material extraction and processing sites like quarry and borrow sites, crusher and asphalt plant have also disturbed the surrounding communities convenience. Generally, the finding shows that there are negative road construction effects in Mizan-Dima. Therefore, prevention and mitigation measures are vital in order to enhance the positive impacts and mitigate the adverse project induced social and environmental impacts on water resources, wildlife species, soil erosion, sound pollution, livelihood and other related impacts. Moreover, the contractor should comply the basic principles of EIA and implement the Environmental management plan appropriately to the ground during construction to minimize the negative impacts of the project. Future researches should endeavor to examine how to mitigate the impacts of road construction projects.

Key words: Environment, Social, Impacts, Road, Road construction, Mizan-Dima

Chapter One: Introduction

1.1 Background

Development projects including infrastructures process expansion have been a prominent feature in urban and rural settings. In many developing countries, such developments often result in population displacement. In this regard, Dhru (2010) found that there is direct relationship between the land acquisition and the rapidly increasing pressures on the land because of urbanization, rapid economic development, increase in infrastructures and other related impacts on growth and development of the economy in various states in Developing countries. Moreover, the problems in most of the developing countries have increased in a day to day fashion. New roads being constructed or constructed roads have important implications for the previously inaccessible population. Such newly constructed roads do not only bring benefits, but also often result in negative consequences on the population. For example, as Nobre (2016) noted, the road construction in Amazon basin, one of the most important cause of dramatically change on the relationships between people and their environment are deforestation and land degradation due to the newly implemented road construction. As a result, these might cause some gaps of rural livelihood alternative solution, giving serious attention on existing services, create the new opportunity to generate the States new economic development as well as increase access to infrastructures (Railey-power et al., 2018; Mendoza et al., 2007).Currently the alteration of the global largest tropical forest has been rapidly expanded network of roads in to the Amazon. Moreover, many of the proposed road projects are existed; however, there is lack of rigorous impact assessment and other impacts as such economic and social impacts justification (Vilela et al., 2020).

Adequate roads promote the provision of public services such as ambulances and other security services. In addition, roads are essential components for the development of markets, which in turn pave new opportunity for farmers in rural areas to bring their products to high value urban markets and thereby increasing profits of the rural poor (Hettige, 2006). These benefits allow the poor an opportunity to sustain and diversify their livelihoods which ultimately leads to the reduction of poverty in rural communities (Hettige, 2006; Vilela., 2020). As a result, many governments in developing countries have given emphasize on rural road construction. Ethiopia has established the road sector development program since 1997. It has contributed undergone rapid expansion in road infrastructure in the country. The RSDP has playing a key role on the

road infrastructure in the country's economic growth and development including poverty reduction (Bekele and Ferede, 2020). Moreover, the government had been invested huge amount of money from funding source of governmental and non-governmental organizations which appropriately designed road construction project and implementation at various sites in the country to improve regional connectivity (Ethiopian Road Authority., 2014).

Before the Ethiopian Government has been developed consecutive plan of Road Sector Development Program (RSDP) by Ethiopian Roads Authority to build the countries road network (ERA, 2015), till very limited access to environmental and social impact assessment and mitigation action in the country. Moreover, there is lack of an innovative way of covering reasonable environmental and social impacts mitigation process to its contractors through the road construction project. The government of Ethiopia has constructed many roads and still plan to construct huge road infrastructures to assist and facilitate the countries overall developments

In like manner, cognizant of the importance of roads to accelerated and sustained economic growth and poverty reduction, Ethiopian Government has been engaged in extensive construction, upgrading and maintenance of roads since 1997 under four successive phases of Road Sector Development Program(RSDP) (Ethiopian Roads Authority, 2015).

The Government of Ethiopia has formulated the five year growth and transformation Plan (GTP) (2010/11-2014/15) to carry forward the critically important strategic plan which pursued in the Plan for Accelerated and Sustained Development to End Poverty in order to recognize ecological or environmental assets are the basis for a communities overall advancements since they are very important to bring holistic social and economic development of a country (Growth and Transformation Plan, 2010). Recently, GTP II(2015/16-2019/20) is also contributes to assure adequate food access in order to avoid the dependence on food aid, decrease number of mortality and morbidity rate of the communities due to poverty and secured the food including other solid foundation in order to alleviate the famine and related impacts(GTP II, 2016). This indicated that GTP has maintained a fast growing and development of the country's economy and it is a road map for better outcomes to realize in all sectors. Practically, the poverty eradication was a main agenda for Ethiopian government since many decades.

However, environmental degradation and mismanagement of natural resources, which are often negative consequences of road constructions, reduce the environment's capacity to support

communities to sustain their normal life. Notwithstanding its positive contributions for economic development, a mismanaged road construction may result in undesired environmental and social consequences particularly to the local communities. Hence, it is imperative to conduct research on the negative consequences of road construction initiatives such as RSDP projects in an Ethiopian context. Therefore, this research was intended to explore the environmental and social impacts of road construction projects on the livelihood of local communities.

1.2 Statement of the Problem

Ethiopian livelihoods of local communities have been facing several environmental and social impacts due to road construction projects. As a result, there are various challenges of the environment and social impacts mitigation as well as proper implementation of road construction project at selected area. Few researches attempted to conceptually systemize the implementation of road construction and both environmental and social impact mitigation with in local communities by studies with identification methods and other related modes. Many of the development projects and large-scale investments are controversial development issues (World Bank, 2010; Deininger 2011; Borras, 2011; Ayele, 2014).

On one hand, development projects create opportunities for socio-economic developments. On the other hand, the acquisition of land by government or investors in poor and vulnerable countries poses a threat to their economies and livelihoods and endangers their chances of achieving food security and improved life. Therefore, it helps to consider the environmental and social impacts when the government has planned to construct the road and before taking on a road construction project at specific site, for example, Mizan–Dima Road project. All construction does not cause for adverse impacts at universal scale but it begins with harming the project affected persons. Construction may result in localized earth degradation and brings water pollution and contaminations unless proper mitigation measures are not taken. (Issaka and Ashraf, 2016).

Some of the recent empirical studies indicate that many of the development investments and projects carried out in recent years have not only failed to increase the well-being of resettled people, but have actually furthered their multigenerational marginalization (Robinson, 2003; Ayele, 2014). According to World Bank (2010) study indicated that involuntary resettlement under development projects, if unmitigated, often leads to severe socio-economic and

environmental risks; give raise to failure of production systems (which leads to impoverishment of people). As the project affected households displaced to new localities that their accustomed effective way of producing might be reduced, social organizations and interactions are less, relatives are detached while developed traditions and communities sense of helping each other is weakened and to the worst absent.

Even though the research have investigated the main impacts of various environmental and social impacts on the road construction projects and their improvements in the road networks on the location decisions of the country various manufacturing firms and performances(Shiferaw et al., 2012a), the majority of road accessibility at rural and urban areas following the RSDP environmental and social impacts and the significance of reduction in average travel time to major economic centers might cause actual problem in the specific road construction project site and the country(Shiferaw et al., 2020) Currently, the poor infrastructure and high transport costs are the most common hindering factors which affecting market competition ,poverty reduction as well as economic growth and development in Africa including Ethiopia(Banerjee et al., 2012; Shiferaw et al.,2012a; Shiferaw et al.,2012b).

ERA makes ESIA before the beginning of the construction to integrate the ESIA with the design, plan and implementation. Once the Environmental and Social Impacts are assessed it is documented and shelved in most projects. Though the ESIA is well studied in its Mizan to Dima road project, the exact implementation or practices of using ESIA document to protect the environment have some problems according to the projects report (HEC, 2012). Therefore, the motivation of this research is driven by: The fact that many problems arise both socially and environmentally due to lack of proper practices of ESIA in road construction projects and there is many challenges to practice the Environmental and Social Impact Assessment. Hence, it is important to document the baseline data of ESIA practice gaps in road projects in relation to the new and upgrade road construction development program, and if not, have also impacts on social and environment of the local communities. To fill the above mentioned gaps the study is intended to answer the questions of what are the environmental and social adverse consequences of Mizan-Dima road construction project on the livelihood of the local community.

Few studies findings shown that there was good environmental practices with a less respected resulting in environmental nuisances for local populations, natural resources and wildlife (AfDB,

2013).Although the government of Ethiopia is trying to solve actual problems related to impact of RSDP and environmental and social impact mitigation through Ethiopian Road Authority as well as Road construction project constructors, there are issues in impact assessment, impact mitigation and overall environmental management practices that affect communities at Road construction project site and around.

The related document for environmental and social impacts assessment and its mitigation on Road construction project are scarce in specific site and elsewhere in Ethiopia. However, assessing the environmental and social impacts of developmental projects such as new road constructions on the livelihood of local communities by taking a Mizan-Dima road construction project as a case study is an important indicator for measuring success of the Ethiopian Road Authority. Furthermore, the environmental and social impact assessment has also not been well integrated in to road construction project and the strong cross-sectoral linkage the impact assessment for RSDP needs is missing. However, some of the measures taken to bring about development are not socially and environmentally nonthreatening unless some sort of precautionary measures are taken. For development to be real and meaningful, it has to be sustainable, whereas making development sustainable requires taking social and environmental values into account. It is undeniable that this poverty reduction, economic growth and development will lead to complex environmental and social impacts and other related challenges towards Road construction project.

Even though environmental and social impact assessment and mitigation is a newly attention required program and an innovative platform for delivering quality impact assessment to Road construction project at specific project site. There was very limited experience and research in Ethiopia to guide developmental projects such as new road constructions on the livelihood of local communities by taking a Mizan-Dima road construction project owned and led by the ERA.

Therefore, the motivation of this research is driven by the fact that many problems arise both environmentally and socially during road construction projects to the local communities.

In order to assess this gaps the study is intended to answer the questions of what are the environmental, social and economic effects of Mizan-Dima road construction project on the livelihood of the local community? What are the barriers on the proper implementation of the

priolry conducted environmental and social Impact Assessment plan and thereby forward working solutions for future implementations of such development projects in Ethiopia?

1.3 Research Objectives

1.3.1 General Objective:

The general aim of this study was to assess the environmental and social effects of developmental projects such as road construction projects on the livelihood of local communities by taking a Mizan-Dima road construction project as a case study.

1.3.2 The specific objectives

1. To analysis the adverse environmental effects of Mizan-Dima road construction project
2. To assess the social effects of Mizan-Dima road construction project on the livelihood of the local communities.
3. To assess the level of economic effects of Mizan-Dima road construction project on the livelihood of the local communities.
4. To examine the barriers on the proper implementation of the priory conducted Environmental and Social Impact Assessment plan (if any) and thereby forward working solutions for future implementations of such development projects in Ethiopia.

1.4 Research Question

1. What are the environmental, social and economic effects of Mizan-Dima road construction project on the livelihood of the local communities?
2. What are the barriers on the proper implementation of the priolry conducted environmental and social Impact Assessment plan (if any) and thereby forward working solutions for future implementations of such development projects in Ethiopia?

1.5 Significance of the study

The information generated from this study will motivate Mizan–Dima Road construction project site, Ethiopian Road Authority and communities may take proper decision. Hereafter, it is useful for a number of reasons: Firstly, Road construction project constructors and their leader may have implement valuable environmental and social impact assessment and mitigations on the ERA program. Secondly, they may identify areas of factors affecting both of developmental

projects such as new road constructions on the livelihood of local communities and it helps to make a conscious effort toward to Mizan-Dima road construction project. Thirdly, the finding of this study will help to improve a road networks which make Urban and rural more attractive for agricultural production, marketing systems, manufacturing firms and therapeutic communication including increase any economic incentives. Fourthly, it will support to integrate the RSDP and firm's location choices. Fifthly, this research result may contribute to start-up size of a manufacturing firms increased due to better road networks at Mizan-Dima road project site and it help to share experience for all Ethiopian Road Authority existing and newly proposed Road construction projects. Finally, it may help to enhance the requisite skills for becoming independent and gaining knowledge on the environmental and social impacts of developmental projects such as new road constructions on the livelihood of local communities.

Moreover, it may contribute to how contractors, subcontractors and their managements including the road construction project specific sites responsible bodies will be manage and direct their own continuing proper implementation of Impact assessment and mitigation. It helps to measure the effectiveness of environmental and social impact assessment and its solution through the targeted area of new road constructions with practice the Environmental and Social Impact Assessment by ERA program effectively.

Furthermore, the study has provided feedback to the road construction Organization, road construction contractors, and design and supervision consultants regarding the significance, application and practice of Environmental and Social Impact Assessments during actual construction implementation to minimize adverse social and environmental consequences. For those who are interested to make further study on the related issue it may be used as an indication. The study can also be used as a literature review for subsequent researchers. This research result may be used to as interest to provincial land use planners, legislation and policy makers, foresters, biologists, road engineers(contractors and sub-contractors) ,and researchers, as well as the many other specialists managing forest and range resources and amenities in road construction project areas and in the country.

Chapter Two: Literature Review

2.1 Concepts of Environmental and Social Assessment

In the 1970s, environmental impacts were considered to be impacts on the natural, biophysical environment such as problems related with air and water quality, climate change, hydrological systems variability, flora and fauna and various stage of noise. However, the focus on biophysical impacts alone did not last long. The institutionalization of EA, with its public disclosure and consultation processes, seemed to act as a magnet to individuals, groups and agencies who wanted other kinds of impacts to be incorporated in decisions (ERA, 2008).

They were assisted to some extent by the evolving definition of the term 'environment' which has increasingly broadened to incorporate social and other aspects. As cited in Ethiopian EPA, 2003 in 1994, the Development Assistance Committee of the OECD defined 'environment' for the purposes of EA as including: Effects on human health, well-being, environmental media, ecosystems and agriculture; effects on climate and the atmosphere; use of natural resources (regenerative and mineral); use and disposal of residues and wastes; and resettlement, archaeological sites, landscape, monuments and social consequences as well as upstream, downstream and trans-boundary effects.

Therefore, since the mid-1970s, additional types of impacts have been added to those consider in decision-making. The scope of EAs has widened to incorporate social, health, economic and other issues. This is reflected in the definition of "Environment" in the Ethiopian EPA publication "Environmental Impact Assessment Procedural Guidelines-Series 1", November 2003. The definition of Environment adopted in this research is "The physical, biological, social, economic, cultural, historical and political factors that surround human beings. It includes both the natural and built environments. It also includes human health and welfare" (Ethiopian EPA, 2003; Wedago and Tekele., 2011).

2.2. Over view of Environmental and Social Impacts of Road construction projects

2.2.1. Environmental Impacts of Road Construction projects

In today's world, many of environmental impact indicators such as green-house gas, acidification potential, ozone depletion, and smog are linked to various stages of the road construction projects. The general environmental impact indicators can be divided into direct, indirect, and

operational emissions (Marzouk et al., 2020). An indicator, comprising a single datum (a variable) or an output value from a set of data (aggregation of variables), describes a system or process that has significance beyond the face value of its components. It aims to communicate information on the system or process (Duque, et al., 2006). The term indicator can be applied to many fields and scientific endeavors. In this report, it will primarily relate to environmental or ecological indicators (Turner and Canter, 2008). Environmental indicators are simple measures that tell us what is happening in the environment. Since the environment is very complex, indicators provide a more practical and economical way to track the state of the environment than if we attempted to record every possible variable in the environment (Tutrner and Canter, 2008).

The environmental pollution is very important concerns in the global growth and development program which related with the construction industries as such road construction projects. Hence, these challenges are due to the massive extent of effluence caused by various construction projects (Marzouk et al., 2017). Moreover, the roads are one of the ways how human development expands as well as people increasingly rely on cars for transportation on a daily basis (ROADEX Network., 2020).

Few of the research finding showed that the limited length of the rod in every countries may causes landscape disfigurement and decreasing number of buildings. For example, more than 20% of land in United States is impacted by the presence of roads, As a result, there is increasing the number of highway roads and over 40 million miles of roadways have covered by constructions (DeGregorio et al., 2010; Environmental Sciences organization, 2020). Furthermore, many of adverse environmental impacts like waste, noise, dust, solid wastes, toxic generation, air pollution, water pollution, bad odor, climate change, land use, operation with vegetation and hazardous emissions by engines emissions are affected the communities during construction stages(Kaur and Arors, 2012).

An appropriate way of thinking about social impacts is as changes to one or more of the below:

- ✓ People's way of life -how they live, works, play and interact with one another on a day-to-day basis.
- ✓ Their culture – shared beliefs, customs, values and language or dialect.

- ✓ Their community – its cohesion, stability, character, services and facilities
- ✓ Their environment – the quality of the air and water; the availability and quality of their food; the level of hazard or risk, dust and noise they are exposed to; the adequacy of sanitation, their physical safety, and their access to and control over resources.
- ✓ Their health and wellbeing-where health is defined as "a complete state of mental, physical and social wellbeing, not merely the absence of disease or infirmity", and is applied to individuals and to the society in which they live; and finally.
- ✓ Their fears and aspirations-their perceptions about their safety, their fears about the future of their community, and their aspirations for their future and the future of their children (ERA, 2008).

For instance, the waterway ecology is maintained by environmental flows which describe the river flow regime necessary. Moreover, the human well-being values of environmental flows very important ecosystem for people's food, income as well as health purposes (Meijer, 2007). Recently, the positive and negative environmental concerns of a plan, policy, program, and/or actual projects prior to the decision to move forward with the proposed action has been taken by environmental assessments (Mackinnon et al., 2018; Ecckston, 2011; Carroll and Turpin, 2009). Furthermore, environmental assessments have been administered by rules and regulations of main administrative procedure regarding community engagement and records of decision making and may be subject to judicial review(Raddy and Hilty.,2008; Hanna.,2009; Fischer., 2016).

With its public disclosure and consultation processes, the institutionalization of EA seemed to act as a magnet to individuals, groups and agencies who wanted other kinds of impacts to be incorporated in decisions.

The Development Assistance Committee of the OECD defined 'environment' for the purposes of EA as including in 1994:

- Effects on human health, well-being, environmental media, ecosystems and agriculture;
- Impacts on climate and the atmosphere;
- Use of natural resources (regenerative and mineral);
- Use and disposal of residues and wastes; and

- Resettlement, archaeological sites, landscape, monuments and social consequences as well as upstream, downstream and trans-boundary effects (ERA, 2008).

Road projects are intended to improve the economic and social welfare of people. Increased road capacity and improved pavements can reduce travel times and lower vehicle operating costs while increasing access to markets, jobs, education and health facilities. For all the positive aspects of the road projects, they may also have significant negative impacts on nearby communities and the natural environment. People and property may be in the direct path of road works and thus affected in a major way. People may also be indirectly affected through the disruption of their livelihoods, loss of accustomed travel paths and community linkage, increases with respiratory problems due to air pollution, and injury from road accident (ERA, 2008)

Environmental Impact Assessment (EIA) is a key aspect of many large scale planning applications. It is a technique which is meant to help us understand the potential environmental impacts of major development proposals. Unfortunately as often as not both the process and the outcome of EIA can be complex and confusing leaving local communities unsure as to how a development might affect them. This guide is intended as a broad introduction to the Environmental Impact Assessment (EIA). The material is drawn from regulations, circulars and guidance and is designed to help individuals understand what EIA is and in what circumstances it should be applied (Friends of the Earth, 2015). Moreover, it is a procedure used to examine the environmental consequences, both beneficial and adverse, of a proposed development project and to ensure that these consequences are taken into account in project design. The EIA evaluates the expected effects on human health, the natural environment and on property; it may also include social effects including gender-specific and special group needs, resettlement and impacts on indigenous people.

The EIA should consider alternative project designs including the "no-action" alternative, as well as mitigation measures or environmental safeguards that should be incorporated into the project design to offset adverse impacts. The assessment will be most useful if it is initiated at the earliest stage of project design to ensure from the outset that aid projects are environmentally sound and sustainable (OECD Development Assistance Committee, 1992).

2.2.2. Social Impacts of Road construction projects

As per the guideline social impacts are the cost of the human population by any public and private actions that change the people live, work, play, relate to one another, organize to meet their needs etc. Social impact focuses on the human dimension of environment, and seeks to identify the impact on people who benefited and loses. The major types of social impacts are relates to lifestyle, cultural, community, quality of life and health related impacts (Shukla and Jani, 2018).The assessment of the social impacts of road traffic is usually based on objective indicators or on expert judgment, without input from the affected communities (Anciaes and Metcalfe, 2017).

Social Impact Assessment are predicts the nature and size of potential negative and positive effects on individuals, businesses and communities. It develops and implements appropriate recommendations and impact management measures to avoid or decease potential negative socio-economic impacts and enhance positive impacts; identifies net social and economic impacts occurring after mitigation measures are applied, including roadway routing, design and operating conditions; and, helps resolve public issues by working with the community to address the potential impacts(Stevebnson.,1995).

2.3. Development Projects and Livelihood of Local Community

New roads have important implications for the previously isolated communities affected by their construction. In the Amazon basin, the deforestation and land degradation often associated with these projects can dramatically change relationships between people and their environment. This may include limiting rural livelihood options or generating new economic opportunities, and increasing access to infrastructure or putting stress on existing services. As a result, the impact of these projects on well-being and poverty is complex, and relatively little is known about how communities perceive these changes. Community livelihood refers to the set of activities which members of the community need in order to secure the basic necessities of life (Mariita, 2006). (Kurgat and Omwenga, 2016)

Geothermal exploitation has been found to have a mixed impact on the livelihood on the communities surrounding. The provision of energy to remote areas, and creation of job opportunities are the positive effects. Local communities, however, typically have only a

marginal direct employment benefit, since mostly specialized people are needed for exploration, drilling and plant operation (Mariita, 2012). Instead, retail trade, health care and social assistance, accommodation and food services sectors often provide potential new sources of jobs for local communities (Rybach, 2006). Barrantes (2006) while focusing on the socio-economic consequences, consequences of geothermal development in less developed regions of Las Pailas geothermal argued that public acceptance of the project and integration of new workers in the existing indigenous social community could presents a potential social impact (Kurgat and Omwenga, 2016).

Livelihoods are the means that enable people to earn a living. This includes the capabilities, assets, income and activities people require in order ensuring that their basic needs are covered. A livelihood is sustainable when it allows people to cope with, and recover from, setbacks and stress (such as natural disasters and economic or social upheavals), and improve their welfare and that of future generations without degrading the environment or natural resources base (Chambers and Conway, 1991 as cited in (GS/OAS and CITES, 2015).

Economic development projects brought innumerable benefits but also had unintended detrimental effects on people and natural resources. Human activities have resulted in the disruption of social and communal harmony, the loss of human livelihood and life, the introduction of new diseases, and the destruction of renewable resources. These and other consequences can negate the positive benefits of economic development.

Social impacts are the impacts of developmental interventions on human environment. The impacts of development interventions take different forms. While significant benefits flow in from different development actions, there is also a need to identify and evaluate the negative externalities associated with them. Such impacts not only need to be identified and measured but also need to be managed in such a way that the positive externalities are maximized and the negative externalities are minimized (Centre for Good Governance, 2006).

2.4. Review of Policies and Legislations

In dealing with environmental management activities of any development project, it is important to understand and follow the requirements of the relevant national policies, strategies and legislations as well as the environmental policies and procedures of the project-financing agency.

Accordingly, the Contractor has reviewed the existing relevant national and regional policies, strategy and legislations as well as the World Bank Safeguard Policies. Thus, the researcher has screened the national and regional policies and legislations plus the WB Safeguard Policies triggered by the Mizan - Dima Road Project.

2.4.1. Review/Consultation of the Previous EIA Study and Other Documents

The contractor has consulted the EIA study previously conducted for the Mizan – Dima–Boma Road Upgrading Project by Highway Engineers and consultant/HEC/ (2011) then, during the current field survey along the project road, the contractor has verified the baseline data and predictions of potential issues presented in the document. Some of those data and information have been extracted and combined with the data collected during the present survey to provide a brief description of the baseline environmental and social condition of the project.

In addition, other relevant project documents including EIA document, the Contract Documents signed between ERA and China MCC17 construction co LTD, ERA Technical Specification, and Division 16000: Environmental Protection and Mitigation Measures. These documentations helped the researcher to obtain necessary information about the road upgrading project and understand its environmental implications of the contractual obligations of the Contractor etc. It is primarily on the basis of these documents and the data collected from the project affected areas site specific impact assessment has been made, appropriate mitigation plan developed and time schedule for its implementation depend on the general schedules of the whole project.

2.5. Mitigation measurements

2.5.1. General mitigation measures

These measures are based on best international construction practice and recommendations of international financing institutions. Certain proposed measures concern specific habitats, localities and sites aiming to avoid construction of access roads and setting up work camps in sensitive habitats. Measures directed toward improvement of supervision of the construction work are also proposed. Construction activities in the area of identified caves and existing archaeological sites are prohibited (Shukla and Jani, 2018).

2.5.2. Main specific mitigation measures

Mitigation and compensation techniques have been discussed for each impact, in an effort to solve the conflict between upgrading the road and its effect on nature fragmentation. Ban of construction works for construction of the planned tunnel at road project site during the breeding season of vultures and other birds of prey. Constructions of culverts for amphibians, reptiles and mammals: in the regions without natural passes and without underpasses, tunnels or bridges will be constructed. The most adequate compensation measure in order to mitigate the impact on the forest is to fund afforestation activities in the frames of the affected forestry districts. Afforestation should be performed with native (autochthonous) tree species as stated in the Law on Nature Protection. Moreover, it is necessary to design and construct appropriate facilities along highway route in order to maintain the existing local roads and important forest paths. By implementing this measure, the fragmentation of agricultural land shall be avoided as well as access to various parts/localities in the hilly region for grazing. Enabling good connection between forest lands on both sides of the highway is essential for accessibility and interventions in case of forest fires (Emtinpna-EMC., 2010).

Chapter Three: Research Methodology

3.1 Description of the Study Area

The Mizan-Dima road construction where the study was carried out is found in the southern part of Ethiopia in the Southern Nation Nationalities and People (SNNP) and Gambella Regional states and traverses through Mizan, Aman, Guraferada, Dima towns. The Ethiopian Roads Authority said a contract agreement is signed with 91.1km Mizan-Dima road, which links Ethiopia with South Sudan. The Ethiopian government and the World Bank will cover the required over 1.1 billion Birr cost to upgrade the road (Ethiopia Roads Authority unpublished Report document, 2020). The road is interconnected different towns in South Ethiopia Peoples' and Gambella States.

Hence, the Mizan-Dima Road is still under construction. The project road connects the potential coffee growing areas with the capital city Addis Ababa through Mizan-Bonga-Jimma-Addis route (Updated RAP, 2012). Besides, it is planned to provide access between Southern part of Ethiopia and Sudan, which is expected to increase the economic and social relations of the two countries. The project has been started at the center of Mizan Town and ends at Dima which is located about 91.6 km from the start (Mizan Town).

According to the updated RAP of 2012, the project area (Mizan-Aman, Guraferda and Mizan) has a population of about 77,751; of which 53% are urban and 47% are rural and the average household size is about 5. The settlement pattern of the Woreda population is dispersed. The population densities vary from 14 person/km2 in Guraferda Woreda to 11 person/km2 in Gambella Woreda. The project area is sparsely populated area with large part is uncultivated land. There are a number of towns traversed by the project road. On the average towns have a population growth rate of 3% per year. MizanTeferi town at the beginning few section of the road are characterized by a high density area while other towns like Guraferda and Dima are low density area of the country and the region. The population growth rate of the region is 2.9 % per annum with an average population density of 127 per sq.km; however, in the zones traversed by the project road the population density is higher: 14 per sq.km in Bench Maji zone and 11 Dima/Gambela. These densities are very low than the national and regional average. (Regional Statistical Abstract, June, 2006). The average family size in the project area is 5.The major

economic activity in the study area is agriculture particularly for the rural population where subsistence farming is the dominant means of earning a living.

3.2 Research Design and Approach

A mixed research design using a qualitative and quantitative research method was employed. In order to achieved the aim of this study, descriptive survey research design was employed as an appropriate research method. This is because descriptive research method was found to be worth importance in describing and explaining the exact and actual situation of the issue under investigation. Moreover, to get the general picture to assess the environmental and social impacts of developmental projects on the livelihood of local community a case on Mizan-Dima road construction project, mixed research method design was conducted. One of the critical thinking of integration between qualitative and quantitative data within a single study is used to strengthen the description of these approaches (Fetters et al., 2013). This type of study design was also used to integrate between data collection and analysis of collected data to assess the complex constructs (Mesly, 2015).

Mixed method research designs serve for the purposes of triangulation, complimentary, illustration of data and offset weaknesses and providing stronger inference. Employing such, approach can also allow for the limitations of each approach to be neutralized while strengths are built upon thereby providing stronger and more accurate inferences (Bryman, 2012; and Creswell, 2014). Triangulation is one of the important ways of validating qualitative research to check the integrity of, or extend, inferences drawn from the data as a means of investigating the convergence of both the data and the conclusions derived from them (Ritchie and lewis, 2003).

3.3 Target population, samples and sampling

The main participants of this study were local project affected communities since the study aimed to assess the impacts of the under construction road project on their livelihoods. In particular, the study focuses on road corridor project affected households who had been influenced by the road construction project. Purposively selected supervision consultant, contractor, and other relevant key informants who were construction project's stakeholders were included. The main reason to focus on these groups are that most of the road construction project

activities referring to the implementation of Environmental Impact Assessment (EIA) and Environmental management plan (EMP) were mostly carried out by them.

On the other hand, annual, quarterly and monthly reports as well as various documents such as EIA manual were used as secondary sources of data.

According to the project's updated Resettlement Action Plan (RAP) 2012, the project affected households (PAHs) survey revealed that 338 households would be affected by the road project (for both rural and urban). Though the total households who were affected by the Road Construction Project were 338, the study only focuses on the purposively selected project-affected households of the active site (site 39+000 km up to 41+500 km). The Researcher purposively selected site 39+000 km up to 41+500 km i.e. Biftu town which is active during data collection. The first reason to select this section is due to the repeated reports from the project exposed that there are a project related environmental and social impacts around this site; secondly, the current global and local situation of COVID-19 pandemics and the country's state of emergency (SoE). Thirdly, it is difficult to collect data from the entire corridor project affected households with the limited capacity of the researcher; and the fact that the road project is under construction by the same client, supervision consultant and contractor. Hence, considering these facts the study population is intentionally limited to the specific aforementioned section of the project.

Since this specific section has 180 project-affected households, the one category of this study population is 180 households as a whole. This category was purposively used to participate on the quantitative research design (survey). As the population is manageable in number and found in a specific area, all of them were used as respondents of the study. As a result, the study has no sample and sampling techniques since all populations were used as a respondents of the study.

The other category of the population for this study was project contractor's and supervision consultant's staff. This category of the population was mainly attended on a qualitative research design part.

3.4 Data types and sources

To get more specific, relevant and reliable information, the data were collected from both primary and secondary sources. While the primary data were gathered using survey questionnaire, interview and FGD, others from secondary sources are from intensive reviews of documents and official reports. In primary sources, the data were from project affected households, consultant, contractor and project affected households. Meanwhile, the secondary data was obtained from policies, strategic documents, government guidelines, books, journals, and other official documents. Population and distribution center based reports like Central Statistical Agency documents, and the like were reviewed to understand the environmental and social impacts of developmental projects on the livelihood of local community in a case of Mizan-Dima road construction project. Triangulating data obtained from different sources is used purposively to maintain the validity of the data obtained, which in turn enrich the findings of the study.

3.5 Data collection tools

Data for study were collected from both primary and secondary sources. Primary data was obtained through questionnaire, semi-structured interview, and focus groups discussion guiding questions. Secondary data collected from various publications and documents from relevant zonal and woreda offices.

3.5.1. Questionnaire

Regarding the household survey, questionnaire with both open and closed ended questions were designed. The instrument was consisted that socio-demographic characteristics of the respondents, environmental and social impacts, economic or livelihood influences of under construction road project. The questionnaire was pre-tested to check their validity and adjustments were made accordingly. Since the households in the study area are mostly Amharic speakers, the questionnaire that was initially prepared in English was translated to Amharic.

3.5.2. Key informants interview (KII)

Interview was a central part of data collection tool for the purpose of this study. A semi-structured interview guide questions were prepared prior to data collection. Here, semi structured interview was used purposively not to miss or not to forget any important points during

interview. Key informants from Project Affected households, Supervision Consultant and Construction Contractor were interviewed.

3.5.3. Focus group discussion (FGD)

FGD was served to verify or validate findings and involves checking the completeness of the data obtained through other tools. Two FGD with 6-8 participants at each FGD was conducted. It was planned to collect from local community that was influenced by the Mizan - Dima road construction project and done accordingly. Accordingly, in focus group discussion the respondents provided a social context for the research, and an opportunity to explore how people think and talk about topic of the study, how their ideas shaped, generated or moderated through conversation with others consensus. Focus group discussion was conducted to get some information about environmental and social impact due to road construction and its mitigation and/ or alternative solutions

3.5.4. Document review

Document analysis was used as a secondary source of data in this study. Environmental and Social Impact Assessment (ESIA) and Environmental and social management plan (ESMP) report was also used to cross check the actual implementation and the assessment's plan. Project's EIA report, work report, different guidelines and manuals were reviewed in order to add relevant information and to cross check the information obtained through other tools.

3.6 Method of data analysis

The data gathered via the aforementioned tools were analyzed quantitatively and qualitatively. The qualitative data obtained through interviews, FGD and others were analyzed and incorporated in the analysis to supplement and substantiate the data secured through questionnaires. Qualitative data was analyzed in to six thematic areas. The collected data were analyzed by using descriptive statistics like mean value percentages, frequencies and was presented using graphs, pie chart and tables.

3.7 Ethical considerations

Ethical clearance was obtained from the Ethical Review Board of Addis Ababa University College of Development Studies Center for Environment and Sustainable Development. Official permission was obtained from Mizan - Dima Road project construction site. Written informed consent was obtained from each study participant to confirm willingness for participation after explaining the objective, procedure, advantage, and disadvantage of the study. Confidentiality of the information was maintained throughout by excluding names and keeping their privacy during the interview, by interviewing them alone. Participants have the right to withdraw any time from the interview and filling the questionnaire.

Chapter Four: Result and Discussions

Characteristics of respondents

The purpose of this study was to assess the environmental and social impacts of developmental projects such as road construction projects on the livelihood of local communities by taking a Mizan-Dima Road construction project as a case study. The sex distribution of the household members who were the respondents of survey study was indicated that 55% were male while 45% were females. The mean age of participants was 35.8 years old. The majority 55% of participants were between 25 and 34 years old, followed by 29.4% were between 35 and 44 years old. 8.9% were at age between 45 and 54 years old. The remaining 6.7% of participants were between 55 and 64 years old. The level of education of the household members showed that unable to read and write 22% were slightly higher than able to read and write 26.7%. It indicates that unable to read and write is prevalent. In general, 21.1% of participants were in elementary school (grade 1-8) and 12.2% were preparatory school (grade 11-12), 6.1% were attended secondary school (grade 9-10), 3.9% were diploma holders; however, only 2.8% participants were Bachelor degree holders. Marital status of the respondents showed that 61.7% were married, and 38.3% were single. Regarding occupational status, the household heads showed that there is higher level of dependency. The proportion of household heads at the status of farmer is 40% while 35% of participants were petty trade, followed by 12.8% were private employee. Out of the remaining, 6.1% were engaged in daily laborer and 6.1% were engaged in other types of occupation.

The demographic characteristics of the key-informants' interview are also presented in table 1 below. The majority of the participants had educational level between grade one and Eight (50%), followed by able to read and write 25% and first degree and above 25%. As it can be seen in the table 1, 60% of the respondents were males while 40% were females. Near to half (45%) of the respondents were between 20 and 30 years old. 30% and 25% of key informants work as Farmer and student respectively. 25% of respondents were petty trade by their occupational status. Meanwhile, the majority 50% were single, followed by 25% were married.

Table 1 Number and frequency distribution of socio-demographic characteristics of survey participant

Variables	**Categories**	**N**	**%**
Sex	Male	**99**	**55**
	Female	81	45
	Total	180	100
Age	25-34	**99**	**55**
	35-44	53	29.4
	45-54	16	8.9
	55-64	12	6.7
	Total	180	100
The highest level of education	Unable to read and write	**49**	**27.2**
	Able to read and write somehow	48	26.7
	Elementary school(Grade 1-8)	38	21.1
	Secondary school(Grade 9-10)	11	6.1
	Preparatory school(Grade 11-12)	22	12.2
	Diploma	7	3.9
	Bachelor degree	5	2.8
	Total	180	100
Marital Status	Single	69	38.3
	Married	111	61.7
	Divorced	-	-
	Total	180	100
Current Occupation	Farmer	72	40
	Petty Trade	63	35
	Private employees	23	12.8
	Daily Laborer	11	6.1
	Other	11	6.1
	Total	180	100

Source: Field survey data, May 2012 E.C

Table 2 Number and frequency distribution of socio-demographic characteristics of key informants

Age	**<20**	**2**	**10**
	20-30	9	45
	30-40	3	15
	40-50	5	25
	50-60	1	5
Sex	Male	12	60
	Female	8	40
Educational Status	Able to read and write	5	25
	1-8th grade	10	50
	Degree and above	5	25
	Total	20	100
Occupation	Farmer	6	30
	Petty trade	4	20
	Students	5	25
	Project employee	5	25
Marital Status	Single	10	50
	Married	5	25
	Divorce	3	15
	Separate	2	10
	Total	20	100

Source: Field survey data, May 2012 E.C

4.1 Environmental and Social Impacts of the road construction project

4.1.1 Environmental impacts of Road construction project

4.1.1.1 Noise pollution

Severity of noise pollution was one of the most important causes of environmental impacts as a result of dynamite blasting during stone production. As indicated in Table 3 below, the majority (50.6%) of participants were indicated that the noise pollution were severe problem somehow in

the study area, and followed by (30%) of them were suggested that the noise pollution due to dynamite blasting during stone production were highly severe. Only 11.7% and 7.8% participants were responded as it is not severe problem and moderately severe problem respectively.

Table 3 The frequency and percentage of severity of noise problem at road construction project area which is resulted from dynamite blasting during stone production, stone crushing and haulage of construction material using heavy vehicle.

Items	Frequency	Percent
Not severe problem	21	11.7
Severe problem somehow	91	50.6
Moderately severe	14	7.8
Highly sever	54	30.0
Very highly sever	-	-

Source: Field survey data, May 2012 E.C

In similar, a study conducted in India by Ushanalini and Somashekar (2020) found that any unnatural sound is noise pollution, which is noisy and objectionable to human wellbeing. Noise is known to be a significant nuisance in the stone quarrying industry, can contribute to hearing loss, and may even have adverse physiological and psychological consequences. The results are greatly attributed to a higher incidence of injuries, general ill health and workplace health risks and decreased productivity of the sector. Communication may be messed with sleep disrupted, loss of attention, irritability, and productivity decreased. Continued exposure to high levels of noise is reported to cause pain, raised blood pressure, nervous breakdown, and eventually leads to hearing loss and deafness. While significant work on the noise emission factor has been carried out, it still appears to be one of the research areas in the field of stone quarries that is largely neglected.

Similarly, study conducted in Beijing by Ma and colleagues (2018) found that environmental noise emissions arising from diversified source has become a significant environmental issue in developed areas in China with growing urbanization and increased vehicle ownership. In developing countries such as China, however, studies on the spatial heterogeneity of noise

emissions and its possible impacts on the mental health of urban inhabitants has been very sparse to date (Ma et al., 2018).

4.1.1.2 Ways of information dissemination when dynamite blasting is ahead to blast for stone production (quarrying)

Table 4 below reveals that the majorities (93.9%) of the participants were not receiving information when the dynamite blasting is ahead to blast with delivering information leaflets through letter boxes, posting notices on notice board and convene an information meeting. However, near to three-fourth(96.1%) of participants were also suggested that they receive information dissemination through announcing at a time using sound magnifiers (Mikes) and placing security apparatus or police at the buffer zone few hours before blasting.

Table 4 Number and frequency distribution of respondents on ways of information dissemination during dynamite blasting is ahead to blast for stone production

Roll No	Categories/Response	A week Before		A day before the blast		Few hours before		Rarely applied		Not at all	
		N	%	N	%	n	%	n	%	n	%
1	Delivering information leaflets through letters boxes	-	-	-	-	-	-	11	6.1	**169**	**93.9**
2	Posting notices on notice board	2	1.1	-	-	5	2.8	80	44.4	**93**	**51.7**
3	Convene an information meeting	5	2.8	7	3.9	-	-	65	36.1	**103**	**57.2**
4	Announcing at a time using sound magnifiers	2	1.1	3	1.7	**173**	**96.1**	2	1.1	-	-
5	Placing security apparatus or police at the buffer zone	12	6.7	24	13.3	**131**	**72.8**	12	6.7	1	0.6

Source: Field survey data, May 2012 E.C

Similarly, a study was conducted in Montana by Swart(2019) found that the experiences of average chemical high explosives were reinvented by farmers, chemical companies, and the agricultural state as implements that farmers would use to restructure farm habitats and to control them. Moreover, Marzouk conducted a study in Egypt and colleagues (2017) found that in the

construction industry, environmental impact is perceived to be one of the major issues. Because of the large amount of emissions caused by construction projects, environmental degradation has been a big threat to construction projects (Marzouk et al.,2017).

4.2.1.3 Vibration due to under construction of road project

Figure 1: below shows that the majority 90% of respondents were ever witnessed vibration due to the under construction road project in their locality. However, only 10% of participants had not vibrations in their vicinity.

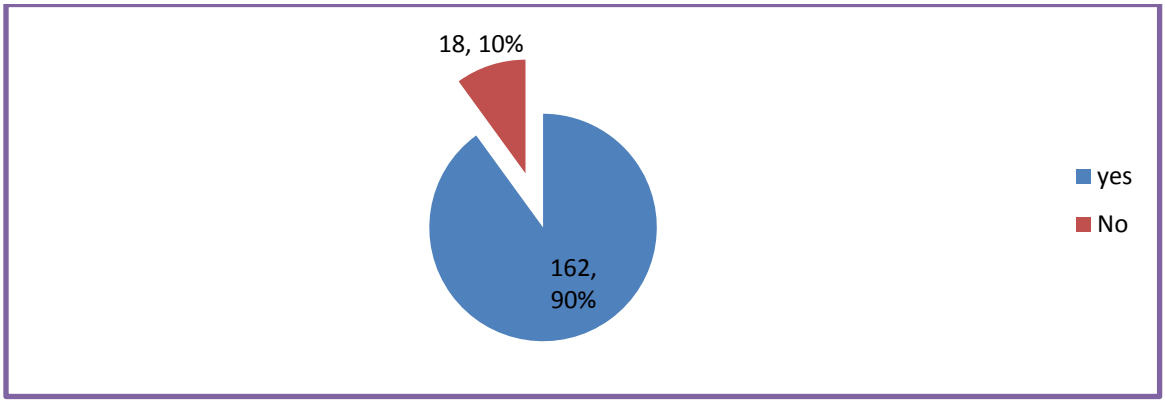

Figure 1.Percentage of participants ever witnessed vibrations due to the under construction road project.

4.2.1.4 How the road construction project increases the waste generations to the local environment

As shown in table 5 below, three items with five Likert scale category of responses used to measure road construction waste generation to the local environment. The data revealed that average for each item was low (1.5-1.7). The minimum and maximum response for all items was 1 and 3 respectively.

Table 5 descriptive summary responses of respondents up on how the road construction project increases the waste generations to the local environment

Item	Min	Max	Mean
Residual road structure materials disposal construction wastes	1.0	3.0	1.7
Waste oils from various plants and equipment	1.0	3.0	1.5
Liquid and solid waste production from camps and garage	1.0	3.0	1.5

Source: Field survey data, May 2012 E.C

A Likert scale category of responses used to measure project's waste generation to the local environment shows most of the respondents suggested residual road structure disposal of construction is one of the most important sources of waste generation to the study area. Residual road structure materials disposal construction wastes is almost average in counting a mean score of 1.7 with the minimum and maximum response for all items was 1 and 3 respectively.

The study also showed waste oils from various plants and liquid and solid waste production from camps and garage are main source of waste generation due to road construction project next to residual road structure materials disposal of construction wastes. In similar, a study conducted by Ferronato and Torretta (2019) indicates that soil pollution with liquid and solid waste disposals is a worldwide issue due to toxic waste mismanagement. The key waste management and final disposal schemes that have been introduced are open dumping and open burning, which are primarily evident in low-income countries (Feronatoaand Torretta, 2019).

4.2.1.5 Dust emission mitigation measures during the project operation which often applied by the project contractor

As it can be seen at Table 6 below dust emission mitigation measures were measured using four items at a five point Likert scale. The mean scores on each item were calculated. Accordingly, the respondents rated was 3.2, the maximum, in average for the first item (i.e. regular watering or showering on sections of the road).The lowest response was score of 1 for all items.

Table 6: Descriptive summary of respondents on dust emission mitigation measures applied by the contractor

Items	Min	Max	Mean
Regular watering (showering) on sections of the road	1.0	4.0	3.2
Limiting the speeds of the car per km	1.0	3.0	1.9
Placing car speed breaker at the road intervals	1.0	3.0	1.9
Proper maintenance of diesel equipment and curtailment of unnecessary idling	1.0	3.0	1.8

Source: Field survey data, May 2012 E.C

4.2.1.6 Over all environmental impacts and its consequences

There are four indicators or items to measure overall environmental impacts due to road construction, as it is shown below in table 7. The highest mean (3) impact was observed for natural vegetation removal and environmental pollution. The lowest mean score was for soil erosion and disturbance to wildlife which was 2.4 and 2.3 respectively.

Table 7 Descriptive summary of overall observed environmental effect at the study area

Item	Min	Max	Mean
Result in soil erosion	1.0	4.0	2.4
Natural vegetation removal	1.0	4.0	3
Environmental pollution	1.0	4.0	3
Disturbance to wildlife	1.0	4.0	2.3

Source: Field survey data, May 2012 E.C

The study indicated that the project has resulted in soil erosion, natural vegetation removal, environmental pollution and disturbance to wildlife are most common environmental impacts. This study is supported by African Development Bank group report in 2016, mitigation of environmental impacts during the planning, construction and operating processes, mitigation steps, environmental management and capability creation are needed. The major concerns are the planning and maintenance of infrastructure systems and roadside drainage and the management of building impacts such as spoil and waste disposal, impacts on water quality, health and safety problems, tree felling, traffic disruption, wastewater and irrigation re-provisioning, noise and dust during earthquakes (African Development Bank, 2016).

4.2.2 Social Impacts of the Road projects

4.2.2.1.The Road project construction results in Population displacement

The majority (77.2%) of participants responded that the road project construction has caused in population displacement; however, only 22.8% of responded as it had not caused for displacement (Figure 2).

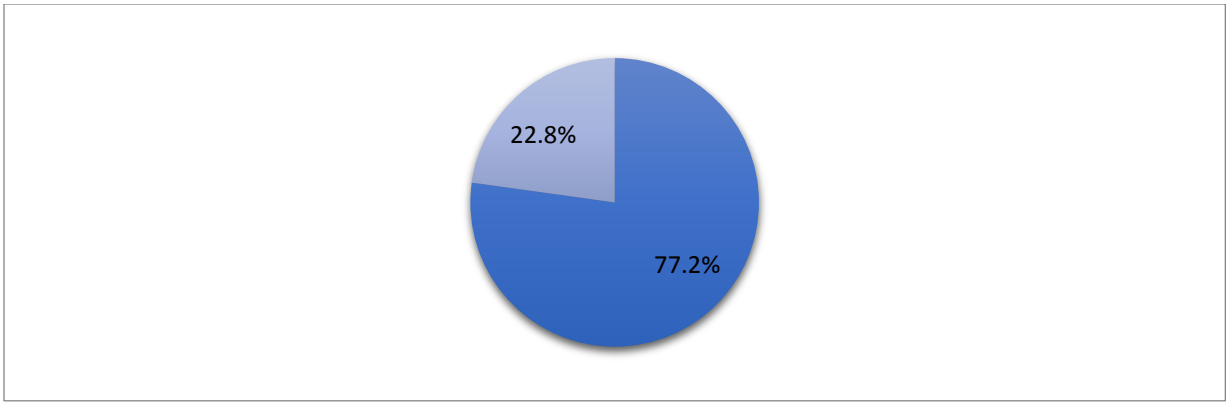

Figure 2 the total percentage of participant who responded on whether the project results in population displacement

The study showed most (77.2%) of participants has suggested that the road project construction had result in population displacement as a social impact. More than half of the participants were agreed the settlement site provided them has no well-developed in infrastructure like electricity, water etc. and difficult to practice culture specially for indigenous people for whom housing provided at road construction project site. Nonetheless, less than (50%) of participants were undecided on whether the project restricted the social cohesion and detaches the community from the closeness of their farm as social impacts.

4.2.2.2. Whether the new settlement site lacks basic infrastructure for displaced people who provided housing

As it can be seen from Table 8 below, a five point Likert scale with 4 items response category were used to measure what kind of basic infrastructures resettlement site lacks. The responses were almost similar for all items. The mean score was 3 for all items. The minimum and the maximum response categories were 2 and 4 respectively.

Table 8: Descriptive summary respondents for whether new settlement site lacks basic infrastructure for displaced people who provided housing

Items	Min	Max	Mean
The site has not well developed electricity, water etc.	2.0	4.0	3
It is difficult to practice culture	2.0	4.0	3
It restricted the existing social cohesion	2.0	4.0	3
It detaches the community from the closeness of their farm	2.0	4.0	3.3

Source: Field survey data, May 2012 E.C

4.2.2.3. Impacts due to source of Vibration

Impacts due to source of vibration were measured using three items at a five point Likert scale. The mean scores on each item were calculated. Hence, the respondents rated the first item (i.e. Damage to building) which were five out of five, whereas the respondents rated low (1 out of five) for all items. The mean score for all the items was comparable which ranges 2.1(item 2) - 2.6(items 1).

Table 9 Descriptive findings on impacts due to source of vibration such as heavy vibration from dynamite blasting at road construction site.

Items	Min	Max	Mean
Damage to building and houses	1.0	5.0	2.6
Threat to security	1.0	4.0	2.1
Inconvenient (Disturbance) to the nearby community	1.0	4.0	2.5

Source: Field survey data, May 2012 E.C

4.2.2.4.The negative social impacts observed at road construction project area

The social impact of the road construction was measured using four items at a five point Likert scale. The mean scores on each item were calculated. Accordingly, the respondents rated the last item (i.e. temporarily limited community interaction/mobility) which were 5 out of five, whereas the respondents rated low (1 out of five) for all items. The mean score for all the items was comparable which ranges 2.4(item 3) -2.7(items 1 and 4).

Table 10 Descriptive findings about negative impacts observed at project area

Items	Min	Max	Mean
Disturb cultural, archeological and religious environment	1.0	4.0	2.7
Impacted on socio-economic environment	1.0	4.0	2.5
Increased competition over local resources such as local medical services, water, electricity etc.	1.0	4.0	2.4
Temporarily limited community interaction/mobility	1.0	5.0	2.7

Source: Field survey data, May 2012 E.C

The study indicated most of the respondents as the project cause effects on cultural, archeological and religious disturbance on the local communities and temporarily limited community interaction/mobility. Similarly, the qualitative study result shows there is a change in life style among relocated communities from permanent place to new settlement area due to the road project. At the new site there were problems of access for both humans and their animals like livestock. Moreover, there was localized environmental pollution, soil erosion and other related environmental and social impacts of Mizan - Dima Road construction project. Similarly, A study was conducted in Madre de Dios, Peru by Riley-Powell et al (2018) found that new road construction projects implementation had important implications for last decades was isolated people who had affected with their consecutive road construction. One of the things which related to change relationships between people and their environment might be caused deforestation and land degradation associated with the road project in the Amazon basin. This indicated that there was limited rural livelihood alternative updated socio- economic growth and development but also increasing access to road construction project infrastructure and existing various customer services. Furthermore, another study was conducted in Southwestern Amazon by Mendoza and colleagues (2007) suggested that the impact of new road construction project relatively little is known about how communities perceive environmental and social impacts and their changes. Similarly, a Riley-Powell and colleagues (2018) agreed that the quickly altered the communities near the road construction sitelink well-being to health, income, community, and the environment (Riley-Powell et al., 2018). Similar with this study, in Europe by Fortun (2017) found that EIA is used to examine the significant adverse impacts within the environment including possible environmental consequences at Road construction project implementation area (Fortun, 2017).

Almost near half of the respondents impacted on socio-economic environment, competition over local resources such as local medical services, water, electricity etc. and limited interactions are the negative impacts observed at project area. In line with, a study was conducted in Ghana by Baah-Ennumh and colleagues (2019) the findings showed that the sector has both positive and negative impacts on the municipality's commercial, social and environmental aspects. Support for communities in the provision of civic facilities and housing, corporate social responsibility and jobs, among others, were some of the positive results. Some adverse effects revealed were land erosion and top-soil loss; noise and vibration; and building crack growth (Baah-Enumh et

al.,2019).A study was conducted by Balansag and colleagues (2018) found that In order to ensure the welfare of citizens, environmental and social threats are the government's main concerns (Balansag et al., 2018). Moreover, an integrating the Environmental and Social Impact Assessment (ESIA) method to evaluate future impacts solidifies the management's planned strategic strategy. Road construction / improvement has various impacts on society, notably on urban environments, while analyzing various techniques for how to mitigate these threats (Balansag et al., 2018).

4.3. Economic Impacts of under construction road project

4.3.1. The main sources of livelihood for households before the introduction of the road project

This study result showed that less than two-fifth (35.6%) of household heads livelihoods was agriculture before the introduction of the road construction project while (28.3%) petty trade and (12.8%) were monthly salary. While 6.7% of households were also living with livestock and 6.1% wage laboring. Only 10.6% of households' livelihood sources are private employee. Table 11 below presents the characteristics of respondents.

Table 11: the Frequency and percentage of main sources of livelihood for households before the introduction of the road project

Items	Frequency	Percent
Agriculture	64	35.6
Private employees	19	10.6
Livestock	12	6.7
Wage laboring	11	6.1
Petty trade	51	28.3
Monthly salary	23	12.8
Total	180	100.0

Source: Field survey data, May 2012 E.C

4.3.2. The severity of the adverse impacts of the road construction project on local communities' income/ livelihood

Severities of adverse impacts were measured using 6 items response categories, at a five point Likert scale. The highest average score 3.7 was observed for item 5 (Destroyed the coffee plantation). The lowest average score was 2.1, item 2(decreases the number of customers from the local business). For all items the minimum response was 1 and the maximum was 5. Table 12 below shows the descriptive summary for all items.

Table 12 Descriptive findings on the severity of the adverse impacts of the road construction project on local communities' income.

Items	Min	Max	Mean
It destroyed the on corridor shops, hotels and other related business	1.0	5.0	2.3
It decreases the number of customers from the local business	1.0	5.0	2.1
Limited safe mobility of business and social cohesion due to land disfiguring	1.0	5.0	2.3
Destroyed the crop	1.0	5.0	3.0
Destroyed the coffee planation	1.0	5.0	3.7
Negatively impacts the health of the communities	1.0	5.0	2.6

Source: Field survey data, May 2012 E.C

The study shows one of the negative impacts of the road construction to the local community is that the projects land acquisitions including forming of different barriers to animals' and humans. The respondents believed that natural plants are affected due to road construction project implementation at some sections of the project and cause adverse impacts on natural water resources and discharge areas. Most of the respondents are suggested that "some of natural plants, especially coffee, mango, maize, and other products, have been badly affected." The finding also showed that the severity of the adverse impacts of the road construction project to destroyed crop especially coffee plantation is highly severe influenced communities' livelihood.

Building roads at its all stages have its own negative impacts whether it is minor or major such as degradation of earth's mineral and organic materials, environmental pollutions and on faunas and floras. (The National Academics of Sciences Engineering Medicine., 2005). The quarry, borrow, crusher and Asphalt plant within the road construction project is still harmful to natural plants at project site. This study finding shows that displaced households have difficulty to practice their culture and beliefs at new settlement area because of the size of the new compound i.e. is 15X20 only. It mean that the community had complained that the provided living place still have not enough to exercise important cultural, social and economic benefits. It is supported by Anciases and colleagues (2016) found that problems arising from cultural differences can cause waste of resources and delay of construction. Therefore, the assessment of the social impacts of road construction is based on objective indicators or on expert judgment, without input from the affected communities (Anciases et al., 2016).

4.3.3. Business operating around before the start of the road construction project

Figure 3 shows that the majority (96%) of participants had not businesses that were operating around the project before the start of the road construction project. However, only 4% had businesses that were operating.

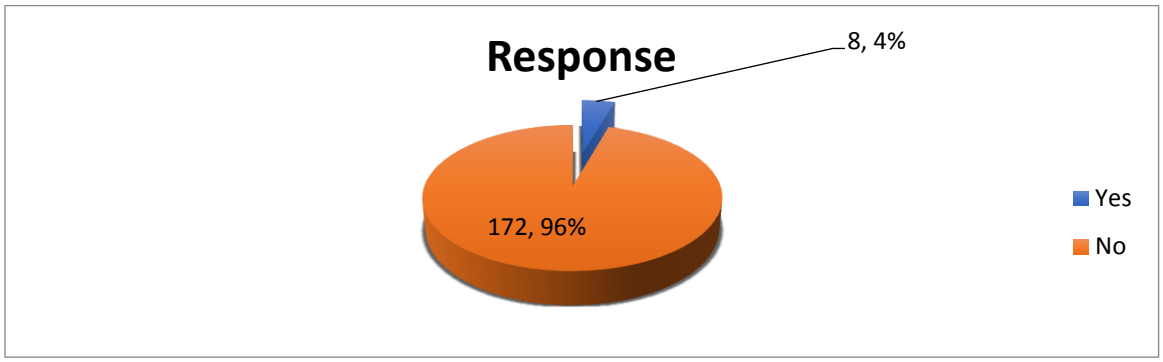

Figure 3 Percentage of participants that had businesses that were operating before the start of the road construction project at a study area.

The study suggested majority (28%) of participants were responded the business activities increased somehow, 24% said increased drastically. Result also showed that 23%, 17% and 8% were used for remain the same, decreased drastically and somehow respectively. A study conducted in Gujarat by Shukla and Jani(2018) suggested that the environmental, social and biodiversity effects of economic growth must be focused in any developmental planning. A study

was conducted in Kenya by Republic of Kenya (2017) revealed that increased connectivity and transport in Kenol Township. The sub-project was provided and enhanced access and traffic flow from Kenol Township to Thika- Sagana Highway (Kenya Republic.,2017). Furthermore, a study conducted in Ghana by Baah- Ennumh and colleagues (2019) found that companies are routinely supervised by the Environmental Protection Agency and the Municipal Assembly to ensure full conformity with mitigation steps. In addition, services for occupational safety and sensitization, as well as medical check-ups and staff screening, must be introduced. This method of impact evaluation helps recognize the positive and negative impact of the proposals introduced. The method of social impact evaluation has enabled organizations to consider how sociocultural, structural, historical and political backgrounds affect the effects of social growth in particular initiatives in many ways.

4.3.4. Impacted Pre-project Existed Business activities during Road construction project underway

Regarding whether business activities that were exist before the commencement of the road construction project but impacted during the project underway at the study area, the majority (28%) of participants responded as their businesses are increased somehow, followed by 24% increased drastically. The remaining 23%, 17% and 8% were used for remain the same, decreased drastically and decreased somehow respectively. Figure 4 below presents Frequency and percentage of severity of noise problem.

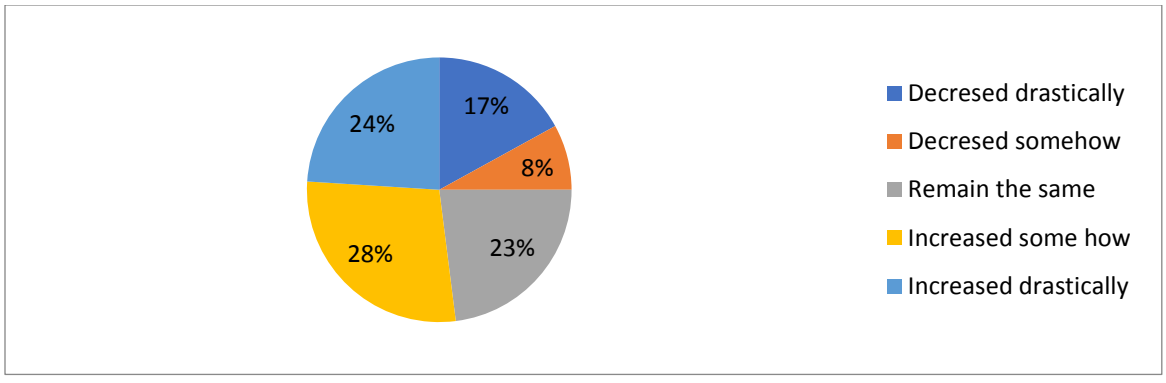

Figure 4: Impacted businesses activities during road construction project underway at study area

4.4. Qualitative study results

4.4.1. Result on Key informants' response

The road construction project's positive and negative aspects of Environmental and Social impact related questions as well as impacts on communities source of income were provided to the respondents of key interviews. Moreover, it was addressed that impact of erosion, noise pollution, limiting movement, removal of natural plants, water resources, disturbances of wild animals, culture and beliefs, are included. The thematic analysis identified and validated six major themes that have incorporated all the recorded data from the interviews.

Table 13. Themes of environmental impacts of Mizan-Dima Road construction project.

Roll No	Themes
1	The positive and negative impacts of the project on the local communities
2	Impacts on Soil erosion
3	Impacts on Noise pollution in the silence of the area
4	Impacts on natural resources as such plants
5	Impacts on wild animals
6	Impacts on local cultures, norms and beliefs

Source: Field survey data (Key informant interview)

Key informant interviews are semi-structured interviews with individuals considered as capable of providing an expert and useful insight about other people, processes or events being researched. At the inception of fieldwork, a key informant mapping exercise was done to identify the institutions and individuals from whom data and information is answered. Key informants were organized into community groups who are living around the project construction area and project implementing units i.e. contractor and consultant staffs. Research questions were then focused by the environmental and social impacts with road construction project coming to the impacted communities' area to ensure that relevant questions were directed to respondents with the relevant experience.

According to key interviews, the ditch and culvert constructions have eroded the farm land, impacted water flow and air, water quality including plants and animals. Avoiding or minimizing the environmental and social impacts within the community at road construction project area is important.

The researcher suggested the current road construction project may be approved either without involving the local communities and considering Environmental Impact Assessment (EIA). This indicates that still community participation, engagement and transparency at all stages of the construction are vital.

4.4.2. The impact of the road project on the project affected communities

4.4.2.1.The positive and negative aspects

Although road projects have beneficial effects, most of the time it brought an enormous adverse effects on the local communities. One of the immigrants shared his feelings by saying;

> *"I started living in this area for the last few months. Even though the road is critically important for our communication system, still it is one of the sources of environmental effects. As a result, the problem is not only to humanity but also to the livestock and wildlife. Sevier environmental impacts are the primarily problem for our living area including soil erosions. During the construction, project area has repeatedly faced noise pollution and deteriorating. Following this, various impacts such as disturbed water sources, high temperature, land disfiguring, and localized climate change, economic and social crises are among those intensifying our problem.* " *(P3, 17).*

According to key informant interview, the road construction project implementation is important for community though there are also still project related problems to solve. EIA is used as a management system to enhance positive impacts while strive to minimize adverse environmental and social impacts of the road construction project. One of the key informants said;

> *"I am 23 years old student and farmer in this area, when I come to this interesting question about Environmental, social and health related impacts of road construction project, let the government support for this project and we can relocated from the previous permanent living place to new place in order get safer area from impacts. We have come to the new place from the warmth of our previous home because of the project. However, still we have no electricity, pure water. The most surprising thing is that this area is not a suitable place for the family, especially comparing to our previous living place. The new site has no enough access road to our farm moreover, the rain is damaging when it falls due to mud formation in the compound."*(P6;24)

Similarly, according to key informant suggestion from project management team the new settlement site provided for displaced households was not well developed in infrastructure, though it is on good progress now. One key informant said;

> *"At the time we came to the site, the site was not well developed. The electric system is not fully installed, water and other facilities were not fulfilled for us. But we are getting now along with the local government structure".* (P19; 53)

Regarding the benefits of road construction, they are encouraged the construction to continue because the road construction will contribute to their socio-economic developments in the future. One of the key informants said;

> *"When one of the participants described the benefits of the construction of this road, we are happy to work on the road because we job opportunity for our children. When we look into the matter "No matter how many people have been displaced by the road, we can tolerate problem because of its future fruits."(*P2,25).

To address this problem, it requires a coordinated action among the project managers, government, community leaders, and other stakeholders

4.4.2.2.Impacts on Soil Erosion

Soil erosions from improper construction of ditches and culverts of road project has reduced the ability of the soil to store water and nutrients and then reduced crop productivity. It is indicated that the exposure of top soil might cause poor physical and chemical properties of the agricultural land at the current road construction project. The participants also suggested that this impacts leads to high rates of runoff, shedding water and nutrients including various crop production as such coffee, banana and other fruits and vegetables in the area.

> *"The waters from the projects ditches come together and flood our road side agricultural lands and even our homes. The problem with flooding has changed our lifestyle. The only issue we could not control for a long time was flooding as the whole house was damaged. Particularly through the elevations, floods come into our homes and places. Therefore, it was very difficult time that we had. "(P4, 40).*

In contrast, one of key informants from the project management team said;

> *"We do construction as per the design, though our ditch and culvert construction sometimes causes some flooding problems in some sections of the project, since we are there full time, we take immediate measures to solve the problem. But majority of the area naturally seems prone to erosion and flooding without the impact of our project".* (P16, 50).

Key informants were suggested that effects of soil erosion need great attention because it may cause pollution and poor water quality. Moreover, it may create sedimentation and decrease different mineral types in the soil.

4.4.2.3.Noise pollution in the silence of the area

During construction period, localized air and noise pollution is resulted mainly at the road constructions from aggregate production, quarry and borrow sites. These can also result from blasting of rocks, operation of concrete batching, asphalt and aggregate production plants, loading and unloading of materials, operation of heavy machinery and movements of

construction vehicles over unpaved roads. The exploitation of borrow pits and quarries and the transport of construction materials created noise and dust. In addition, installation and operation of plants, and loading and unloading of materials will cause dust, noise and exhaust emissions that will likely affect neighboring residential areas.

For example, many of the participants were suggested, the sound pollution is one critical problem in our area because this comes due to the road construction project implementation which will come directly to us and create environmental pollution.

Key informant said that

> *'There is no noise in the present since we changed our residence but in the past there was nuisance from stone crusher machine and haulage heavy machineries and vehicles. It was reduced after we have relocated to the new current site"*. (P2,25). Most of the people who participated in this research were from new site previously living with noise pollution area. One of the participant complained, *"Noise pollution has been greatly reduced since we came here. The problems of this kind were seen before. It is better now than before. Now it is very good* "(P3, 17).

The result fining shows that some of the participants were agreed that there were high degree of noise pollutions at crusher area but decreased at the new resettlement area. It is clear that the sound has been reduced due to the fact that people have relocated to the new place because of road projects impact.

According to key informant noise pollution (unwanted sound) might damage our physiological and psychological health. Because we expected that excessive noise pollution cause cardiovascular diseases as such hypertension, psychological distress like high stress levels, specially ear disorder as such hearing loss, sleep disturbances, and other harmful and disturbing effects. They believed that noise pollution at road construction project have associated with social, physical, emotional and other chronic psychological problems including to facilitate the cognitive decline. Key informants said,

> "*As we know that noise pollution at this area is unwanted because it is unpleasant, loud or disruptive to hearing throughout life style. As a result, an excessive noise pollution due to the road construction project could influence our communities' physical and psychological health condition. It is frankly speaking, the crusher sound that the occurrence of aggressive behavior, disturbance of sleep, constant stress and excessive body fatigue."(*P1,23).

4.4.2.4.Natural plants and farmers crops are affected

The study result shows that the negative side of the road projects is to occupy wide land resources including forming of different degree of barriers to communities and animals as such wild animals. The removal of natural forests and indigenous trees for the projects land acquisitions purpose at selected sections of the project can cause adverse impacts on natural ecosystem. The researcher has identified the damaging effects of the road construction and management using interview. The majority of key informants were agreed that the excessive dust emission and blown from quarry, borrow and crusher areas to the nearby coffee and other crops within the road construction project influenced area is still harmful. There was shortage of water and even if there is an access, it was getting worse. However, there was no way to find water. As a result, regarding these problem, the natural plants are affected during site clearance like removing of trees and bushes for project select material extraction, camp construction and deposal sites.

4.4.2.5.Impact on wild animals

The majority of key informants believed that the current road construction project implementation is very important for improving connectivity among different ethnic groups and communities around the project site, transportation system, increasing both development of social and economic level including improving life expectancy of communities in the region. However, it brought immeasurable complications to humans and wild animals life and other related fragmented effects especially for wild habitats, obstructed animal movement and have led to road side kills. They responded that this problem may lead to risk of wild life conservation efforts.

Almost all of key informants from community who had participated in the study were suggested that they had never seen any wildlife harmed and has problem of access.

4.4.2.6.Impact on local culture and beliefs

Most of the respondents believed that culture in Ethiopia is one of the strong attaching powers to make people to live together. They were suggested that culture enhances their life style and it helps to develop their common wellbeing as communities.

Many of key informants agreed, they have faced scarce land in the new settlement to practice our culture. One of key informants said;

> *"When one of the family member is died, in our culture we bury the dead body in the compound but we cannot do it now because of the compound is very narrow. The new compound is 15by 20 only per household. In addition, it is very difficult to improve cultural learning and to come together to pray with others."* (P1;23).

Culture of the local people to road project site is vitally protected, procedures and increase relationships among communities. It helps to facilitate the integration of the road construction project implementation in the environmental control context based on the project area concerned.

According to some participants, we have problems with the culture and beliefs of this area, and we have problems with where we are now living. One of the key informants said;

> "*I also believed that in the past our compound is wide enough to bury one the family member when died, but the resettlement compound is not enough to practice this. I have my own faith. However, if they die we have nowhere to bury and carry us, so this roadwork has caused us trouble and we have to question.* A*s there is a problem in culture, especially in the absence of religious space (P2,25), which is expected to reduce the effects of cultural and religious beliefs on the community. In addition, the church has been particularly affected by the culture and beliefs, which means that the church is damaged, and the lack of a*

church building and the failure of schools to spread the damage to culture (P3,17).

4.4.3. The analysis of Focus Group Discussion:

According to focus group discussions, the impact of road construction project having on the environment and social context was repeatedly mentioned as the biggest change both before and after relocations to new settlement area. When asked the gap to EIA implementation, barriers to mobility and solutions taken for main problems at project area, the focus group responded as follows: It was emphasized that the environmental and social impact protection through relevant context at project site were motivated by the presence of the contractors and supervision consultant, which revived interest in updating and the need to engage in processes of continuing safety management.

According to focus group discussions, the new resettlement site gives low service to meet their physiologic and social needs. The service given in the new resettlement area is worse than the life he was living before relocation to here. It's not comparable with the previous life before the road construction project coming to here, I am thankful to God, who give me resistant to save everything either bad or good. We are now exposed to this environmental and social problem.

According to focus group discussions, the impacts which related with identified during this EIA and mitigation measures have been easily proposed to avoid, minimize, and reduce potential environmental and social impacts. This may be helps to ensure both uniformity and standard environmental and social impact evaluation methods which utilized with senior environmentalists.

Environmental and social impacts are among the main challenging problems of road construction project implementation various areas in Ethiopia. In particularly on Mizan - Dima road construction project in Ethiopia is a project area which mainly affected by both impacts. Thus particular attention was given to discuss the underlying causes of Environmental and social impacts related with road construction project in which the study was conducted (Mizan-Dima Road project). The main reasons for the environmental and social impact that is most important for the districts are lack of effective system performance and other related problems as such the widen gap in performance in relation to EIA, barriers to disabilities and lack of specific problem

solving methods. The choice of focus group interview was singed on the need to facilitate further elaboration on specific and broader issues covered through other instruments. Thus, this part elaborated and explored the problem in detail. Therefore, the focus group interviews did not only record the responses from the participants, but also provided an opportunity for the researcher to explore the social dynamism of the community and to observe the non-verbal responses to questions or comments raised in the discussion. It also provided a way of analyzing the similarities and differences between the participants and the nature of their arguments. Through such exploration of the group itself and the nature of the responses, the researcher was able to understand some issues which needed further investigation through other instruments.

Gaps in projects EIA performance

According to focus group discussions, Environmental and social impacts related with road construction project caused a vast majority of stress on local acquisitions, soil erosion caused from culverts and ditches, increased environmental pollutions like dust emission from crusher site, removal of natural forests. These effects can gradually destroy the environmental resources on which communities itself depends. Moreover, they have said that the possible performance gap in related to EIA did the project have on the environmental and social context directly by a road construction project and the release of a substance in the environment. "We believed that EIA is used to identify, predict and evaluate the economic, environmental and social impact of development activities and it helps to provide information on the environmental consequences for decision making during road construction project performance at specific site. However, still there is gap." Even though environmental Impact Assessment (EIA) is important to inform the public and decision makers of likely consequences of a proposed action in order to avoid or mitigate environmental degradation. But the communities lack this and project managers, government and community leader including subcontractors should be taken into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse at specific project area.

Barriers to implement the EIA

According to focus group discussion, one of the main problem which caused barriers to Environmental Management Impact (EIA) at the project site in relation to may be due to lack of stakeholders awareness including local communities regarding the impacts due to noise and dust

pollution, socio-economic impacts, its mitigation measures and the project managers and owners of this road construction project may have used undeveloped and no standard on impact management program. There are several socio-economic barriers that affect the capacity and willingness of the actors to participate in the project including political influence, lack of human and financial capacity, gender gap, and loss of community spirit and lack of environmental and procedural awareness in relation to EIA. Therefore, barriers to appropriately implement the EIA in this project site are still need governmental concerns.

Solution taken for environmental and social impacts in relation to EIA

The participants were agreed that as we have information about the main protection method for both social and environmental impact related with road construction project , the proposed mitigation and monitoring actions must be applied during the subsequent stages of the road construction project particularly on Mizan-Dima road construction project in Ethiopia, including the detailed engineering design, pre-construction for construction, project construction, project decommissioning, and Project operation and maintenance stages. They suggested that an action should be taken through an appropriate site or location of quarry and borrow material sources and their operation and hauling condition, design and operate the contractors' site facilities and rehabilitation of borrow pits and quarries; demobilization of the contractors' camps and conversion to agreed social service facility in this specific road construction project area.

Focus group participants said that the potential environmental and social impacts and related problem at Mizan–Dima road construction project area must be assessed and predicting easily. EIA as we think it is a tool that evaluates options, design appropriate mitigation and monitoring measures. But we are already impacted with social and environmental factors at this project site; therefore, it takes an account to avoid socio-economic, cultural and human-health impacts by improving the gap in performance of EIA.

The impacts from the project is the primary causes for soil erosion, increased pollution, natural habitat loss, and increased pressure over local resource competitions. It is vital to approve the level of social and economic status of the community at road constructive projects. Generally we believe that EIA and EMP help to control environmental safety and it ensures sustainable economic development if properly applied to the site.

Chapter Five: Conclusion and Recommendations

5.1 Conclusion

The study shows environmental and social effects along the studied road were waste disposal dumping, nuisance noise, dust pollution, soil erosion, natural vegetation removal, damage to residential houses, disturbance to wild life and population displacement. However, it has been noticed that dust pollution and damage to buildings were found to be the most important causes of environmental and social effects of the project. The Mizan-Dima road construction caused soil erosion at most of the culverts and other road drains. While damage to natural vegetation and disturbance to wildlife remains limited, off-site effects are very important.

The results obtained from survey and key informants interview shows that cultural disturbances are sever problem. Threat to security and inconvenience or disturbance to the communities close to the road project is found problem.

On the other hand, the study showed the businesses of the study area are increasingly stimulated as a result of labour influx to the project area for the newly created job opportunity by the project. Accordingly, the existing businesses of the area were increased during road construction.

Generally, the study revealed the critical barriers to implement EIA and EMP on the ground were poor engagement of project affected communities and various stakeholders like concerned sectors' experts, policy makers during major project design to decommissioning phases. In addition, the negative perception of EIA and EMP by the supervision consultant and contractor, lack of awareness, and capacity to conduct environmental audits and weak enforcement and institutional linkages were also barriers to implement the projects EIA and EMP.

5.2 Recommendation

Based on the major findings of the study and the discussions made on the important issues raised in the previous chapters, the following points are recommended.

- Maximum care should be taken during road project design, construction and main alignment through areas that are sensitive from environmental, social and conservation position.
- The construction contractors should comply and apply a projects' basic safeguard documents such as EIA and EMP giving awareness to project affected communities and key

stakeholders in every development phases of the project in order to minimize the adverse effects and to enhance the positive influences of the project. Proper care shall be taken while selecting material sites for project in put like quarry and borrow pits.

- The government shall take rehabilitation measures sufficient to assist the project affected communities to improve living standards, income earning capacity and production levels through creating job opportunities with alternative means of livelihood and income generating activities.

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Appendices

Annex I: Questionnaires

Addis Ababa University

College of Development Studies

Center for Environment and Sustainable Development

Survey Questionnaire for local communities

The name of the investigator is Segni Dadi from Addis Ababa University, Environment and Sustainable Development Masters Programme, Addis Ababa. He is conducting Master's Degree study on the title Environmental and Social Impacts of Road Construction Projects on the livelihoods of local Community by taking Mizan-Dima road construction project as a case study in Addis Ababa University. The purpose of this questionnaire is to capture first-hand information to assess the socio economic impacts of road infrastructure development. All Questions you are going to be asked are purely for academic purpose. So you are thoughtfully requested to respond honestly to all items stated in the questionnaire. Be sure that the information you provide will be kept confidential.

Thank you in advance for your heartfelt cooperation.

1. **Socio-demographic characteristics**

1.1.Gender: Male ☐ Female ☐

1.2. Age(Years): _____

1.3. What is the highest level of education you have attained:

A. Unable to read and write
B. Able to read and write somehow
C. Elementary School (grade 1-8)
D. Secondary school (grade 9-10)
E. Preparatory School (grade 11-12)
F. Diploma
G. Bachelor Degree
H. Master's Degree and above

1.4.Marital Status

A. Single
B. Married
C. Divorced
D. Widowed

1.5.What is your current occupation or main means of livelihood?

A. Farmer
B. Merchant

C. Petty Trade
D. Governmental employee
E. Private employee
F. Daily laborer
G. Others (specify) _____

2. **Questions focusing in Environmental and Social Impacts**

2.1. **Environmental Impacts**

1. How do you rate the severity of noise pollution in your area resulted from dynamite blasting during stone production (quarrying), stone crushing and haulage of construction material using heavy vehicle?

    1. Not sever problem
    2. Severe problem some how
    3. Moderately sever
    4. Highly sever
    5. Very highly sever

2. How often do you receive information when the dynamite blasting is ahead to blast for stone production (quarrying)? Please, rate the information shown in the table using given rating scale.

    1= A week before 2= A day before the blast 3= Few hours before 4=Rarely applied 5= Not at all

S/No.	Ways of information dissemination	Scale				
		[1]	[2]	[3]	[4]	[5]
1	Delivering information leaflets through letter boxes					
2	Posting notices on notice board					
3	Convene an information meeting					
4	Announcing at a time using sound magnifiers(mikes)					
5	Placing security apparatus or police at the buffer zone					

3. In your locality, have you ever witnessed vibrations due to the under construction road project?

    A. Yes B. No

4. Please rate how often the road construction project raises(increases) the waste generation in your area by using the rating scale below

1= Not at all 2= Rarely 3=Sometimes 4=Often 5=Always

S/No.	How the road construction project increases the waste generations to the local environment	Scale				
		[1]	[2]	[3]	[4]	[5]
1	Residual road structure materials Disposal of construction wastes					
2	Waste oils from various plants and equipment					
3	Liquid and solid waste production from camps and Garage					

5. Please rate how often the contractor apply the dust emission control during the project operation

   1= not at all 2= not sufficient 3= undecided 4= sufficient 5=more than sufficient

S/No.	Dust emission mitigation measures during the project operation which often applied by the project contractor	Scale				
		1]	[2]	[3]	[4]	[5]
1	Regular watering(showering) of road section					
2	Limiting the speeds of the car per km					
3	Placing car speed breaker at the road intervals					
4	Proper maintenance of diesel equipment and curtailment of unnecessary idling					

6. How do you rate overall environmental impacts observed in your area due to the road construction? Please rate the statements presented in the table below by using the following scale?

1=Strongly Agree 2= Agree 3= Undecided 4= Disagree 5= Strongly Disagree

S/No.	Environmental impacts	Scale				
		[1]	[2]	[3]	[4]	[5]
1	Result in soil erosion					
2	Natural vegetation removal					
3	Environmental pollution					
4	Disturbance to wildlife					

2.2.**Social Impacts of the Road Project**

1. Does the project result in population displacement?

   A. Yes B. No

2. If your answer for the above question Number 1 is "*Yes*", what infrastructure did the new settlement site lacks for those provided housing? Please rate the statements in the table below.

   1=Strongly Agree 2= Agree 3= Undecided 4= Disagree 5= Strongly Disagree

S/No.	Social impacts	Scale				
		[1]	[2]	[3]	[4]	[5]
1	The site is not well developed, electricity water, etc. were not fulfilled					
2	It is difficult to practice culture					
3	It restricted the social cohesion					
4	It detaches the community from the closeness of their farm					

3. Please indicate how much you agree or disagree with impacts due to source of vibration such as heavy vibration from dynamite blasting at your locality from the road project.

   1=Strongly Agree 2= Agree 3= Undecided 4= Disagree 5= Strongly Disagree

S/No.	Impacts due to source of vibration	Scale				
		[1]	[2]	[3]	[4]	[5]
1	Damage to building and houses					
2	Threat to security					
3	Inconvenience(Disturbance) to the nearby community					

4. How do you rate the negative social impacts observed in your area due to the road construction? Please rate the statements presented in the table below by using the following scale?

1=Strongly Agree 2= Agree 3= Undecided 4= Disagree 5= Strongly Disagree

S/No.	Negative Social impacts	Scale				
		[1]	[2]	[3]	[4]	[5]
1	Disturb cultural , archeological and religious environment					
2	Impacted on social economic environment					
3	Increased competition over local resources such as Local Medical services, water, electricity etc.					
4	Limited community interaction/mobility					

2.3 Questions related to Economic Impacts of under construction Road

1. What was the main source of your livelihood before the introduction of the project (you can choice more than one)?

   A. Agriculture
   B. Private employee
   C. Livestock
   D. Wage laboring
   E. Petty trade
   F. Monthly Salary
   G. Others(specify)————————

2. How do you rate the severity of the adverse impact of the road construction project on your or other influenced community's income/livelihoods? (example dust emitted from the crasher)

1= Not Severe problem 2= Sever problem somehow 3= moderately sever 4= Highly Severe 5= Very highly sever

S/No.	Adverse impacts	Scale				
		[1]	2]	3]	4]	5]
1	It destroyed the on corridor shops, hotels and other related business					
2	It decreases the number of customers from the local business					
3	Limited safe mobility of businesses and social cohesion due to land disfiguring					
4	Destroyed the crops					
5	Destroyed the coffee plantation					
6	Negatively impacts on the health of the communities					

3. Do you have a business that was operating before the start of this road project

   A. Yes
   B. No

4. If *Yes* to question Number 3, did the business activity during this road construction project impacted?

   A. Decreased drastically
   B. Decreased somehow
   C. Remain the same
   D. Increased somehow
   E. Increased drastically

Annex II: Key Informant Interview Guideline

Interview Guide Questions for Supervision Consultant staff

Participants' information

1. Please introduce yourself, tell me about yourself,
    - your education background,
    - your current position in the company,
    - work experience in the site

Environmental Impact Assessment and Environmental management related questions

1. As a supervision consultant, could you please explain to me if the ESIA and EMP document fully implemented to the ground?
   1.1 Is there an implication whether an ESIA and or EMP is implementing or not?
   1.2 If not implemented, what is the barrier to do so?
2. Do you think it is from the EMP quality document or from the reluctance of the contractor to implement?

Interview Guide Questions for Contractor staff

Participants' information

- your education background,
- your current position in the company,
- work experience in the site

1. Could you please tell me if the project EMP revised? If so, how many times?
   1.1 Is the plan workable?
2. Please tell me what were the challenges you face while implementing EMP on the ground?

Interview Guide Questions for local communities

Participants' information

- your education level,

1. Is there an environmental and social change or impacts on this locality after road construction project started?
   1.1 Could you please explain what the changes are?
2. Is there an impact on the health of local community?

2.1. Have you observed an impact on the community's livelihood?

2.2. Please tell me the Positive and the negative impacts

Annex III: Focus Group Discussion Guideline

FGD Guide Questions for local communities

Could you please introduce yourself?

1. **System performance and problems**

   1.1 In your opinion, what impact did the project have on the environmental and social context?

   1.2 The gap in performance in relation to EIA

   1.1.What are the barriers to effectively implement the ESIA and EMP?

   1.2.What solutions have you taken for problems?