ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

SCHOOL OF COMMERCE

Department of Project Management

Assessment of project Risk Management Practice on Agricultural Projects Financed by Development Bank of Ethiopia

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DECLARATION

Student

This research is my original work and has not been present for MA degree programs in any other university.

Name:_____ID:_____Signature:_____Date:_____

Advisor

This research has submitted for review with our approval as university advisor.

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ABSTRACT

In the agricultural sector, risks are inherent and ubiquitous, posing potentially serious consequences for stakeholders and consumers. Agricultural projects financed by Development Bank of Ethiopia are a victim of such risks due to several factors. This study is aimed to assess risk management practice of agricultural projects financed by DBE by assessing risk management process such as risk planning, risk identification, risk analysis, risk response and risk monitoring and control. The study used descriptive research design and quantitative research approach where stratified sampling technique is used to gather information from selected directorate staffs in the Bank and project managers of the projects. 50 agricultural projects were assessed and 172 questionnaire were distributed to respondent from that 137 response were collected and put to analysis. Secondary data was used to contextualize and discuss the theoretical aspect of the study. SPSS V20 is used to analyze primarily data collected by the way of percentage, mean and standard deviation. Finding from the study revealed that, there is less risk management practice in risk planning and risk analysis process than other processes, and it is evident that much more work needs to be done to improve the project risk management practice in order to reduce threat and increase opportunities of agricultural projects financed by the Development Bank of Ethiopia. The study recommends, future research be performed on other project sectors financed by Development Bank of Ethiopia, such as tourism, mining, and quarries, among others.

Keywords; Risk, Project Risk Management, Agricultural Projects, Development Bank of Ethiopia

LIST OF ABBREVIATION

ADLI	Agricultural Development Leads Industrialization
APM	Association of Project Management
BSI	British Standard Institute
EU	European Union
DBE	Development Bank of Ethiopia
GDP	Growth Domestic Product
GTP	Growth and Transformation Plan
IT	Information Technology
IRM	Institute of Risk Management
NPL	Non-Performing Loan
PM	Project Management
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
RBS	Risk Breakdown Structure
SPSS	Statistical Package for Social Science
SWOT	Strength, Weakness, Opportunity and Traits
UNDP	United Nation Development Program

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The agricultural sector in Ethiopia provides employment to 85% of the population (of which women constitute 49.5% according to the 2007 census data), contributes 44% to the country‘s GDP and 85% of the country‘s export earnings. The country‘s aspiration for achieving overall economic growth largely depends on the performance of the agriculture sector. (UNDP, 2016). The share of agriculture in GDP declined to 34.1% in 2017/18 from 36.3% of a year ago. This was marginally lower than 34.5% GTP II set target for the fiscal year (DBE annual report, 2019). The government of Ethiopia has been following Agricultural Development Leads to Industrialization (ADLI) policy and also giving enormous incentives to domestic private and foreign investors to get involved in agriculture sector in order to ensure the availability of quality and sufficient raw material supply to the selected prior industry sectors. These industries have a huge comparative advantage and will have a potential to boost the country export capacity of semi processed and processed industrial products and at the same time to address the major macroeconomic problems that the country facing such as high unemployment rate , shortage of hard currency , minimum tax collection from the private sectors and lack of quality and sufficient raw material. (UNDP, 2016). The importance of agriculture to the economic fortunes of the country makes mainstreaming of agricultural project risk management relevant.

In the agriculture sector, risks are inherent and ubiquitous, posing potentially serious consequences for stakeholders and consumers. Risks disrupt supply chains, causing extensive financial and economic losses. Agricultural risks are also the principal cause of transient food insecurity, creating a poverty trap for millions of households across the developing world that enforces a vicious cycle of shock and recovery. Risks that are prevalent in agricultural projects includes weather risks as well as uncertain access to yield-enhancing inputs, biological and environmental risks (e.g. plant and animal diseases and pests), unreliable access to markets and price risks (World Business Council for Sustainable Development , 2020). The awareness of project risks and the need to manage them has become one of the areas of interest to researchers and practitioners in the recent past. It is one of the main areas of project management body of knowledge (PMBOK) as well as the body of knowledge of the Association of project management (APM) of the UK (Raz et al., 2002).

Project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, and monitoring and control risk on a project, that aim to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project (PMI, 2013). Risk management is explained as the performance of activities designed to minimize the negative impact of uncertainty regarding possible losses. Risk management is also described as a systematic process for the identification and evaluation of pure loss exposure faced by an organization or an individual, and for the selection and implementation of the most appropriate techniques for treating such exposure.

1.2 Background of the Organization

Development Bank of Ethiopia (DBE) is one of the state-owned financial institutions engaged in providing short, medium and long-term credits over the last 109 years. The Bank has been playing central role in promoting the over-all economic development of the Country since its establishment time of 1909. In its over a century old service, DBE has established recognition at the national and international levels. Nationally, it is the sole Bank with reputable experience in long-term investment financing. Internationally, it is recognized as an important on-lending channel for development programs financed by bilateral and /or multilateral sources. The recent focus of the government in relation to the revised credit policy of DBE is to provide medium and long term loans for investment projects in the government priority areas such as Commercial Agriculture, Agro-processing, Manufacturing Industries, Mining and Extractive Industries preferably, export focused as well as lease financing for Small and Medium Enterprises.

As in many developing countries, the growing demand of investment in Ethiopia for commercial agriculture, manufacturing industry, mining and extractive industry and agro processing requires huge amount of funds to be invested. Development Bank of Ethiopia (DBE) as the second largest bank in terms of loan portfolio in the country should be able to finance such projects in order to be benefited from such opportunities and contribute to the country's growth and transformation plan. (DBE Annual report, 2016). Since its establishment in 1909, the bank has been playing a significant role in promoting overall economic development of the country. The under listed names and periods are its predecessors since initial establishment: -

- Agricultural Bank of Ethiopia from 1945-1949

- Agricultural and Commercial Bank of Ethiopia from 1949-1951
- Development Bank of Ethiopia Share Company from 1951-1970
- Investment Bank of Ethiopia from 1964-1970
- Agricultural and Industrial Development Bank Share Company from 1970-1979
- Agricultural and Industrial Development Bank from 1979-1994
- Development Bank of Ethiopia from 1994-onwards

The repayment periods for such loans can extend up to twenty years depending on the nature of the projects. DBE's loans are highly leveraged since its debt account 75% of a total capital requirement of the project in normal cases. DBE finances projects that are important for sustainable economic growth of the country and are in line with the priority agenda of the regimes at different period (DBE, 2016). DBE finances a very large size of loan based on project financial requirement that extends up to 25% of its total capital to single borrow. The bank charges subsidized simple interest rate 12% and have incentive for projects who are engaged in export activities that is 11.5%. Project financing is full of risks due to specific nature of projects. In agricultural projects risk like, liquidation due to the possibility of economic, political and social change and requirement of involving of so many participants from inception to operation makes risk management more difficult.

1.3 Statement of the Problem

Risk management has become an important part of the management process for any project. The effective use of project management practices such as risk and value management are considered as key supporting processes in addition to quality, cost, time and change control all together generate an integrated approach to the project success (Kishek & Ukaga, 2008). Project risk management has been identified as a necessary strategy and is important because being successfully in order to identify and manage risks are vital to project success (PMI, 2004); (Hilson, 2004). However, On the PMI, (2017) pulse of the profession survey, 40% of the project managers surveyed acknowledged that they rarely or never use project risk management practices on their projects. Projects do not succeed when the stakeholders are incompetent in terms of risk management practices. Agricultural projects financed by Development Bank of Ethiopia are reported to be experiencing inadequate experience of proper risk management practices, poor risk management culture and appetite, shortages of competent project management professionals and project risk managers (Annual Risk Management Report of the Bank, 2019). This is the main reason why most of projects falls behind schedule leading the project for cost overrun and consequently for project failure. The risk associated

with every projects are distributed in the project life cycle however, what makes agricultural Project different from construction and manufacturing project is its implementation stage since delay in its implementation means there is for sure rework associated with it specially for farm activities like land development and preparation operations that leads it for higher cost overrun.

According to the five-year strategic reform plan of the Bank (September 2019), the current level of NPLs of the Bank in terms of magnitude and ratio is significantly higher than what is deemed to be normal for Development Banks (maximum 15%). Non-Performing Loan (NPLs) has surged to Birr 15.4 Billion, i.e., 39.4% of the total outstanding loans. Here, agricultural projects accounts to be the second troubling loan after manufacturing industries.

Sudhakar G, (2016) argued that risk management is the highest ranked factor for project failure that is why an organization, in order to be successful, should be committed to address risk management proactively and consistently throughout the project rather than reactively. Agricultural project failures is also the other face of development Bank of Ethiopia due to lack of effective implementation of project risk management process and other factors this is the reason why now days it feels normal to see foreclosure advertisement of agricultural projects financed by Development Bank of Ethiopia. A conscious choice should be made at all levels of the organization to actively identify and pursue effective risk management during the life of the project. Moving forward on a project without a proactive focus on risk management is likely to lead to more problems arising from unmanaged threats (PMI, 2013).

Millions of dollars have poured into rural finance, especially agricultural credit, in the past and yet rural communities have little to show for it. Donors, governments and bankers became disillusioned with the results. Therefore, considering the difficulty, complexity and unpredictability nature of agricultural projects, in order to achieve project objective in terms of time, cost and quality outcomes, managing risks is very mandatory strategic move for many agricultural investment projects. Moreover, majority of studies that are done in Ethiopia regarding project risk management practice are concentrated on construction sectors and less is known about risk management practice in agriculture sector. In accordance to this, by taking agricultural projects financed by DBE as a case study, this study will try to assess risk management practice of agricultural projects.

1.4 Research Question

The survey attempts to resolve the research problem through representing the accompanying fundamental research questions regarding the practice of project risk management in the agricultural projects financed by DBE;

- How do proper risk planning in agricultural projects financed by DBE is exercised?
- How do potential risks in agricultural projects financed by DBE are identified?
- What has been their process of analyzing project risks?
- How do risk responses in agricultural projects financed by DBE is executed?
- How do risk monitoring and control process is practiced?

1.5 Research Objectives

1.5.1 General Objective

The general objective of this project thesis is to assess risk management practice on agricultural Projects financed by Development Bank of Ethiopia.

1.5.2 Specific Objective

The study will have the following specific objectives.

- To assess the practice of risk management planning during the risk management process
- To assess the effectiveness of risk identification during the risk management process
- To assess risk analysis and the techniques and tools used for risk analysis
- To assess the strength of risk response and mitigation mechanisms undertaken
- To assess overall effectiveness in risk monitoring and control

1.6 Significance of the Study

In a country where agriculture covers, 34.5% of the GDP and more than 80% of its population depends on it, assessment of project risk management practice is mandatory, bearing in mind that those agriculture based project absorbs huge initial investment and must be implemented considering timeliness cost during operation. However, lack of proper risk management practice will result in cost overrun, poor quality, schedule overrun, scope change and eventually leading to project failure. Therefore, this study is important as it adds on to these initiatives by assessing the practice of risk management process associated with agricultural projects financed by DBE, which consequently explores the level of understanding that exist in this organization. In addition, most assessment of project risk management practice where done in

construction and manufacturing projects moreover, this study will play an important role in improving the existing knowledge of risk management process practice on agricultural projects.

The study stands to be significant to first; DBE as it will empower it to utilize critical information resulted from the research by evaluating and incorporating the gap identified for future risk management practice in the Bank. Secondly, concerned government organ like Ministry of Agriculture, as it will shed more insight in to the knowledge and practice of agricultural projects risk management process and thus enabling them to incorporate the findings and scale up their work. Finally, project manager and investors will be benefited from the study, as it will help them to analyze and update themselves regarding practice of project risk management process to cop up with shortcoming in order to receive more value in future agricultural projects.

1.7 Scope of the Study

The main emphasis of this project thesis is to assess risk management practice on agricultural Projects financed by Development Bank of Ethiopia and this project work will be restricted to agricultural projects financed by Development Bank of Ethiopia that are administered at Head office for the last ten years. The method of reasoning behind this is leading an exploration up on the entirety of the DBE financed projects will be time taking and monetarily compelling.

1.8 Limitation of the Study

The spread of Corona Virus (Covid-19) pandemic makes difficult for the researcher to collect primary data and secondary data extensively, the researcher has attempt to make light of the challenge through electronically devices and online download literatures and published books.

1.9 Organization of the Study

This thesis contains five chapter and organized as follows: Chapter one is an introduction to the study. Chapter two reviews theoretical literatures relating to project, risk or uncertainty, Agricultural project risk, risk management, project risk management process and related issues through looking into related writings. Moreover, it encompasses the empirical and conceptual framework parts. Research methodology managed in chapter three. In addition, chapter four presents result and discussion of the data. Finally, the last part presents conclusion based on the analysis and on which some possible recommendations are determined.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 Theoretical Background

2.1.1 Concepts and Definition of terms

2.1.1.1 Project

Project is widely used word in the world however, it does not mean it is clearly understood. Different literature could define project from different angles. Some of the definition are more comprehensive than other definitions. According to Project Management Institute (PMI); a Guide to the Project Management Body of Knowledge (PMBOK Guide), project is a temporary endeavor undertaken to create a unique product, service or result. A project is a complex, non-routine, one-time effort limited by time, budget, resources, and performance specifications designed to meet customer needs. The major characteristics of projects are: an established objective, A defined life span with a beginning and an end, usually, the involvement of several departments and professionals, typically, doing something that has never been done before, and Specific time, cost, and performance requirements (Gray & Larson, 2005). By the definition of Association for Project Management (APM), it is defined as a unique transient endeavor undertaken to achieve a desired outcome. Moreover, according to the definition of British Standard Institution (BSI), a project is clearly explained as a unique process, consisting of a set of coordinating and controlled activities with start and finish dates, undertaken to achieve an objective conforming to specific requirements, including constraints of time, cost and resources.

2.1.1.2 Agricultural Projects

Agricultural development project can be rain fed or irrigation based investment that can be used to produce fruits, vegetables, cotton….etc. or projects that process raw materials to produce processed foods. Agricultural projects are activities that involve farming of short term crops and Animal husbandry set up with unique approaches to address a specific situation like poverty or hunger (Nalianya, 2018).

2.1.2 Life Cycle of a Project

PMI (2017) states project life cycle as series of phases that a project passes through from its start to its completion. It provides the basic framework for managing the project. This basic framework is assumed to be applied regardless of the specific project work involved. The

phases may be sequential, iterative, or overlapping. All projects can be mapped to the generic life cycle project life cycles [with this regard are believed to be independent of product life cycles] which may be produced by a project. A product life cycle is the series of phases that represent the evolution of a product, from concept through delivery, growth, maturity, and to retirement. Since project phase is thought to be collection of logically related project activities that culminates in the completion of one or more deliverables, phases in a life cycle can be described by a variety of attributes. To this end, projects may be separated into distinct phases or subcomponents. These phases or subcomponents are generally given names that indicate the type of work done in that phase.

2.1.3 Risk

Holton refers to two components of risk to provide a definition that fits risky situations, namely risk exposure and uncertainty. Thus, he defines the risk as being exposed to a statement in relation to which there is a certain level of uncertainty (Holton, 2004). Olsson focuses on uncertainty, pointing out that most people refer to negative consequences in relationship to the unknown. He believes that this is a limited point of view that does not consider the possibility of benefits that can be obtained from risk assumption, since an essential prerequisite in business is that you need to take risks to win. His definition is concise: "the risk is given by the uncertainty of a future outcome" (Olsson, 2002). The PMBOK® Guide define risk as an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more project objectives (such as scope, schedule, cost, and quality). Risk can be defined as the chance of loss or an unfavorable outcome associated with an action. Uncertainty is not knowing what will happen in the future. The greater the uncertainty, the greater the risk. For an individual farm manager, risk management involves optimizing expected returns subject to the risks involved and risk tolerance (Laurence et al., 2013). Risk is what makes it possible to make a profit. If there was no risk, there would be no return to the ability to successfully manage it. For each decision, there is a risk-return trade-off. Anytime there is a possibility of loss (risk), there should also be an opportunity for profit. Project risk is a measure of the probability and consequence of not achieving a defined project goal. Risk has two primary components for a given event: a probability of occurrence of that event and impact of the event occurring (Kerzner, 2009). A risk may have one or more causes and, if it occurs, it may have one or more impacts. A cause may be a given or potential requirement, assumption, constraint, or condition that creates the possibility of negative or positive outcomes (PMI, 2013).

The common features of all definitions are the following: the probability or possibility of loss, the variability of the potential outcomes or the uncertainty of the achievement, the deviation from the real and expected outcomes, the probability of any outcome different from the outcome expected, the situation, when the quantitative scope of a particular phenomenon is a subject of certain distribution of the probability. In addition, a negative deviation from the target, the jeopardy of the erroneous decision, the possibility of the loss or profit, an uncertainty linked to the development value assets, the median of the loss function (Jankelova et al., 2017).

2.1.3.1 Classification of Risks

Risks are mainly identified as internal risks, external risks and project specific risks (Miller, 2000).

Internal risks

Those risks that directly relate to the project and fall under the project management team's control are termed internal (El-Sayegn, 2014). These risks are again divided according to the specific originator such as the designer, contractor, owner, suppliers and subcontractors.

- ✓ **Owner risks** - studies have identified various ways in which the project owner can become another source of risk. This includes delaying payments to contractors, imposing an unreasonably tight schedule, making design changes, intervening in the project, delaying contractors' access to the site, not defining the scope of the project, suddenly going bankrupt or breaching the terms of the contract (Remington & Pollack, 2007).
- ✓ **Designer risks** - The main problem here is usually impractical designs that are difficult to implement, but risks can also arise if the drawings are poorly executed or the specifications are incomplete or inaccurate.
- ✓ **Contractor risks** -Contractors become risk sources by producing poor quality work or low productivity, by demonstrating incompetence, by being involved in accidents at the construction site or by being unable to deal with unexpected technical challenges. They can also pose a risk if they have too few staff, if the key staff leaves in the course of a project, or if they become engaged in disputes with sub-contractors (Zaneldin, 2006).
- ✓ **Sub-contractor risks** -As indicated above, sub-contractors are an additional source of risk. If they fail to deliver the work as agreed with the contractor, this can result in

breach of contract. Where sub-contractors are not qualified for the job, this can lead to poor performance (Zaneldin, 2006).

- ✓ **Supplier risks** -Suppliers can cause risks in construction projects by failing to deliver materials on time or by delivering poor quality materials (Miller, 2000).

External risks

Internal control systems have no influence on external risks, which may be caused by social, natural, economic, political and cultural factors. Research has associated each of these categories with various risk events.

- ✓ **Political and government risks**- Political risks include war threats and political instability. Changes in regulatory guidelines and rules may also affect the project. Other risks are posed by workers' dissatisfaction or even industrial action, which can interrupt project activities and negatively influence the project's objectives. Studies have also identified delays in permit approvals and corruption among officials as possible sources of risk affecting manufacturing projects (Knecht, 2002).
- ✓ **Social and cultural risks**-Social and cultural factors, which have their origins in the external environment, may nevertheless create conflict within the project; for example, cross-cultural differences, substance abuse and criminal act (Demkin & American Institute of Architects, 2008).
- ✓ **Economic factors** - Miller (2000) found that sudden changes in prices and inflation were the most significant economic risk factors for local and international companies in his study. Other economic factors, which can pose risks to construction projects, are shortages, whether of equipment, work force or materials, and currency fluctuations.
- ✓ **Natural factors** -Natural risks may include unpredicted inclement weather and unforeseen site conditions (Loo et al., 2013).
- ✓ **Other factors**- El-Sayegh (2008) identifies another category of external risks that he refers to as "others". Into this miscellaneous category, he places events such as difficulty in claiming insurance, local protectionism, unfair tendering practices and delays in resolving litigation and contractual issues.

Project-Specific Risk Factors

A very critical risk factor is the client's problems. We separate this category in two sub categories: i) problems with cash flow and ii) excessive demands from the client. Concerning the first option, it is the most critical factor for this category of risks. Always, there is the danger

of a sudden bankruptcy from the client, forcing the project to stall. In addition, the client may delay to pay, resulting schedule overrun of the project. On the other hand, clients often impose tight time schedules that are impractical to achieve. Moreover, they try to rush the projects for obvious time and cost reasons.

A project may face different challenges and uncertainties in the planning, build-up and even post completion phases. According to the literature, most of the risk that a project faces arises from uncertainty. There are five types of risk sources that cause uncertainty in the project (Ward & Chapman, 2003).

1) Variability associated with estimates;
2) Uncertainty about the basis of estimates;
3) Uncertainty about design and logistics;
4) Uncertainty about objectives and priorities; and
5) Uncertainty about fundamental relations between project parties

Jafaari (2001) identified several risk categories that a project may encounter: political, promotion, technical, market, financing, operating, schedule, environmental, cost and organizational risks while, Rolstadas et al. (2011) added a new category to this list called contextual risk, which refers to external factors that can influence project performance and lead to negative impacts.

Meanwhile, Artto et al. (2011) divided complex project risks into four types:

- ✓ **Pure risk**- unfavorable events such as, fire or other accidents, which cannot be predicted in advance. Although there is a low probability of pure risk occurring, it can cause significant damage to a project. The liability of such types of events lies with the insurance company, thus it is also known as insurable risk.
- ✓ **Financial Risk**: these are risks relating to a project's financial activities, including funding of the project. This might also have a major impact on the project's success, as it includes exposure to currency fluctuation, liquidity and operative cash flow.
- ✓ **Area-Specific Risk**: these risks occur due to specific geographical, cultural, political, national and environmental issues. Sudden natural calamities or political instability of that specific location can have major impacts on the project and
- ✓ **Business Risk**: all other risks aside from those mentioned above. They can arise from small activities that may superficially seem negligible, but may end up affecting the activities of the whole project. Business risks may occur at any time during the project

and influence its outcome. Risk are categories into operational, short term strategic and long term strategic risk (Krane et al., 2010).

Fontaine (2015) divided the risks faced during projects into project risks and technical risks. Project risks can arise during the project building or implementing steps and have impact on the project, whereas technical risks occur during the post-completion phase of the project. According to a website of PM (2017), project risks are mainly categorized as costs, schedule and performance risk. There are also other form of risks, such as governance, strategic, operational, market, legal and external hazard risks, which ultimately impact on the aforementioned cost, schedule and performance of the project. Aside from project risk, there can be also project deferral risk, which is associated with failure to complete the project and can also be caused by the aforementioned sources.

There has been extensive research on the classification of project risks and these classification need to cover all types of risk in more detail. The sources of risk can be represented depending on the environment in which they arise (Williams & Heins M, 1995): physical environment; social environment; political environment; operational environment; economic environment; legal environment; cognitive environment.

Another way to classify risks in project, with an utterly different purpose though, is to distinguish them to known and unknown risks. Known risks are those that have been identified and analyzed, making it possible to plan responses to those risks. For known risks that cannot be manage proactively, the best way to deal with them is to assign a contingency reserve on the project budget. Unknown risks are those that cannot be identified and managed proactively and therefore should be assigned a management reserve for them (PMI, 2013).

Several studies have used a risk breakdown structure (RBS) to organize the various categories of risks. Risk sources can be financial, strategic or operational (Xenidis & Angelides, 2005) and can lead to higher than predicted expenses in procuring materials, or lower than expected sales after the project completion, or poor accounting during the project management phases. Examples of financial risk sources include government and commercial factors, while strategic risks can arise because of inadequate staff training or IT, or poor marketing; and problems with production, security and maintenance are all sources of operational risk. Health and safety regulations and environmental concerns can pose an additional compliance risk.

2.1.3.2 Risks in Agricultural Projects

The risk in the agriculture is perceived in the literature in the same way in several dimensions. Firstly, as a business with a typical price and demand fluctuations (Uematsu and Mishra 2011; Sulewski and Kloczko-Gajewska 2014), emerging from the trade liberalization and the changes of the Common Agricultural Policy (Lien et al. 2003; Bureau et al. 2005; Flaten et al. 2005; Ahn et al. 2009; Park 2013; Lee and Lim 2015). Also another risks characteristic for this sector as the climate, weather, infections, which have the tendency to rise (Alcamo et al. 2007; Olesen et al. 2011; Kemény et al. 2013; Legg and Blandford 2015; Kan et al. 2015; Prokopy et al. 2015).

The five primary sources of risk in Agricultural projects are Production, Marketing, Financial, Legal and Human (Laurence et al., 2013).

- ✓ **Production risk**- Agricultural production implies an expected outcome or yield. Variability in those outcomes poses risks to your ability to achieve financial goals. Any production related activity or event that has a range of possible outcomes is a production risk. The major sources of production risks are weather, climate changes, pests, diseases, technology, genetics, machinery efficiency, and the quality of inputs. Fire, wind, theft, and other casualties are also sources of production risk.
- ✓ **Marketing risk-** Marketing is that part of a farm business that transforms production activities into financial success. Agriculture operates in a global market. Unanticipated forces anywhere in the world, such as weather or government action, can lead to dramatic changes in output and input prices. When these forces are understood, they can become important considerations for the skilled marketer. Marketing risk is any market related activity or event that leads to the variability of prices farmers receive for their products or pay for production inputs. Access to markets is also a marketing risk.
- ✓ **Financial risk**- Financial risk encompasses those risks that threaten the financial health of the business and has four basic components:
    1) The cost and availability of capital;
    2) The ability to meet cash flow needs in a timely manner;
    3) The ability to maintain and grow equity;
    4) The ability to absorb short-term financial shocks.

  Cash flows are especially important because of the variety of on-going obligations such as cash input costs, cash lease payments, tax payments, debt repayment, and family living expenses.

- ✓ **Legal risk**- Many of the day-to-day activities of all farmers involve commitments that have legal implications. Understanding these issues can lead to better risk management decisions. Legal issues intersect with other risk areas. For example, acquiring an operating loan has legal implications if not repaid in the specified manner. Production activities involving the use of pesticides have legal implications if appropriate safety precautions are not taken. Marketing of agricultural products can involve contract law. Human issues associated with agriculture also have legal implications, ranging from employer/employee rules and regulations, to inheritance laws. The legal issues most commonly associated with agriculture fall into five broad categories:
    1) Contractual arrangements;
    2) Business organization;
    3) Laws and regulations;
    4) Tort liability; and,
    5) Public policy and attitudes.

  Human risk- People are both a source of business risk and an important part of the strategy for dealing with risk. At its core, human risk management is the ability to keep all people who are involved in the business safe, satisfied and productive. Human risk can be summarized into four;

    1) Human health and well-being;
    2) Family and business relationships;
    3) Employee management; and,
    4) Transition planning main categories:

2.1.4 Project Risk management

According to a Guide to the Project Management Body of Knowledge (PMBOK Guide); 4th ed. 2008; "Risk management is a continuous, repeating a set of interrelated activities that aim to control the potential risks. It includes maximizing the results of positive events and decreasing the negative results of these risks. The purpose of risk management is to avoid problems or negative occurrence, avoid crisis management and prevent problems."

Risk management in a project encompasses identifying influencing factors that could potentially negatively impact a project's cost schedule or quality baselines; quantifying the associated potential impact of the identified risk; and implementing measures to manage and mitigate the potential impact. The riskier the activity is, the costlier the consequences if the

wrong decision is made (Mills, 2001). Risk management is not a separate project office activity assigned to a risk management department, but rather is one aspect of sound project management. Risk management should be closely coupled with key project processes, including but not limited to: overall project management, systems engineering, cost, scope, quality, and schedule (Kerzner, 2009). The amount of project risk management can vary based on attributes such as risk tolerance, resources, and organization maturity along with specific project attributes. Any amount of project risk management can be a benefit to a project, although balance needs to be used to avoid wasting time and energy on excessive or costly activities that provide only diminishing returns (Marchetti, 2011).

The management of risk in projects is currently one of the main topics of interest for researchers and practitioners working in the area of project management. Risk management has been designated as one of the eight main areas of the Project Management Body of Knowledge (PMBOK) by the Project Management Institute, which is the largest professional organization dedicated to the project management field. Furthermore, most training programs for project managers include a course on risk management. Within the currently accepted view of project management as a life cycle process, project risk management is also seen as a process that accompanies the project from its definition through its planning, execution and control phases up to its completion and closure (Raz & Michael, 2001). As we mentioned before, project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, and controlling risk on a project. The main objectives of project risk management are to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project. Project risk management includes the processes of conducting risk management planning, identification, analysis, response planning, and monitoring and control risk on a project, that aim to increase the likelihood and impact of positive events, and decrease the likelihood and impact of negative events in the project (PMI, 2013).

2.1.4.1 Project Risk Management Planning

Plan risk management is the process of defining how to conduct risk management activities for a project. The key benefit of this process is it ensures that the degree, type, and visibility of risk management are commensurate with both the risks and the importance of the project to the organization. It is vital to communicate with and obtain agreement and support from all stakeholders to ensure the risk management process is supported and performed effectively over the project life cycle. It involves defining what risk management activity will occur,

establishing the allotted time and cost for risk management activities, assigning risk management responsibilities, deciding how risk probability and impact will be measured and deciding on acceptable risk thresholds and tolerances (PMI, 2013).

i. Plan Risk Management: Inputs

Project Scope Statement: it details the measurement goals, objectives, deliverables and requirement of the project, and the acceptable criteria of deliverable will be. It describes the work required to meet all the objectives and the deliverable of the project, and contains milestones, assumptions, risks, and cost. The project scope provides an indication of the level of risk management that the project will require.

Project Charter: the project charter can provide various inputs such as high-level risks, high-level project descriptions, and high-level requirements.

Cost Management Plan: is part of project management plan, and it provides guidance for all the cost process. It establishes how project cost will be planned for, estimated, organized, reported on, forecasted and managed. For planning of risks, the cost management plan defines how the financial costs of risk management activities will be budgeted for.

***Schedule Management Plan*:** is part of the project management plan, the schedule management plan details how the project schedule will be managed and controlled. For risk planning, it defines how risk management activities will be scheduled.

Communication Management Plan: is a subsidiary plan of the project management plan, and it details the communication needs and requirement of the project and the stakeholders, assigns responsibility, details the frequency and methods for communication elements, and defines the escalation paths for issues. For risk planning, it defines how data on risk will be communicated.

Enterprise Environmental factors: risk planning is affected by the risk tolerances, attitude and threshold of the organization and its stakeholders.

Organizational Process Assets: risk planning is affected by the risk management methodology of the organization, standardized risk management templates, risk reporting format and stakeholder register.

ii. Plan risk Management: tools & techniques

Planning meeting and analysis; risk management planning will involve meetings and discussions between the project manager, project team, stakeholder, and others within the organization as needed.

Analytical techniques; analytical techniques are used to understand and define the overall risk management context of the project. Risk management context is a combination of stakeholder risk attitudes and the strategic risk exposure of a given project based on the overall project context. For example, a stakeholder risk profile analysis may be performed to grade and qualify the project stakeholder risk appetite and tolerance. Other techniques, such as the use of strategic risk scoring sheets, are used to provide a high-level assessment of the risk exposure of the project based on the overall project context. Depending on these assessments, the project team can allocate appropriate resources and focus on the risk management activities.

Expert Judgment; to ensure a comprehensive establishment of the risk management plan, judgment, and expertise should be considered from groups or individuals with specialized training or knowledge on the subject area, such as Senior management, Project stakeholders, Project managers who have worked on projects in the same area (directly or through lessons learned)…..etc.

Plan risk Management: outputs

Risk management Plan: is a component of the project management plan. It details and defines the risk management activities for the project. The plan establishes the risk methodology, roles and responsibilities, risk categories, probability and impact scales, risk tolerances, frequencies of risk management activities and reporting, and the budget and schedule for risk management activities.

2.1.4.2 Project Risk Identification

Risk identification is an important step as the other steps in the risk management process such as analysis and response are only successful if potential risks are identified properly (Toakley A & Ling S, 1991) and (Wang, Dulaimi, & Aguria, 2004). The purpose of risk identification is to identify both the threats to the business with the potential of reducing and removing the likelihood of the business reaching its objectives, and the opportunities, which could enhance business performance (Chapman, 2011). The key benefit of this process is the documentation of existing risks and the knowledge and ability it provides to the project team to anticipate events (PMI, 2013).

i. Project Risk Identification: Inputs

Risk Management Plan: defines the risk management activity for the project, and it establishes the risk methodology, risk roles and responsibilities, risk categories, probability and impact

scale, risk tolerances, frequencies of risk management activity and reporting, and budget and schedule for risk management activities.

Activity Cost Estimates: the reliability of this estimate can be a source of project risk.

Activity Duration Estimates: since there are many factors that influence duration, including resource availability, duration estimates can be a source of project risk.

Scope Baseline: is the approved project scope statement, WBS, and WBS dictionary. The scope includes explicit and implicit assumption (which are risks) and constraints, which are also risks. The scope can also highlight risk elements due to project complexity.

Stakeholder Register: Stakeholder should participate in the risk identification process, and their interest and expectations may also be risk factor.

Cost Management Plan: The plan's approach to cost management may increase or decrease project risk factor.

Schedule Management Plan: details how the project schedule will be managed and controlled.

Quality Management Plan: The plan's approach may increase or decrease project risk factors.

Project Documents: documents outside the project management plan can be used to uncover risk elements. This includes project charter, project schedule, issue log & quality check.

Enterprise Environment factors: commercial database, checklists, benchmarking, and industry specific articles may help uncover risk elements.

Organization Process Assets: lesson learned, risk identification templates, and historical project information may help identify risk.

ii. Project Risk Identification: Tools and Techniques

Documentation Review: a review of project documentation can expose constraints, assumptions or incomplete documentation that can be sources of risks.

Information Gathering Techniques: risks can be identified through any combination of information gathering techniques, such as brainstorming, interviewing, root cause analysis and Delphi techniques.

Checklist Analysis: risk checklists from previous projects can be used to assist in the risk identification, or risk checklist can be established. Checklist used should be reviewed and improved upon so that they're useful for later projects.

Assumptions analysis: assumptions analysis reviews the validity and soundness of assumptions since assumptions are always a source of risk.

Diagramming techniques: diagrams can help identify risks by exposing relationship or by delving into the root cause of risks. Risk diagramming techniques includes cause and effect diagram, flow chart, and influence diagram.

SWOT Analysis: SWOT Analysis involves the review and analysis of group discussion of strength, weakness, opportunity, and threats for project objectives.

Expert Judgement: expert judgment is based upon the experiences and knowledge of subject matter experts.

iii. Project Risk Identification: Output

Risk register: a component of project management plan is a comprehensive list of all threats and opportunities the project faces. It also contains supplementary data about each risk, including its impacts, probability, risk response, budget, risk owner, and contingency and fallback plans.

2.1.4.3 Project Risk Analysis

Risk analysis is a systematic process to estimate the level of risk for identified and approved risks (Kerzner, 2009). This involves estimating the probability of occurrence and consequence of occurrence and converting the results to a corresponding risk level. The approach used depends upon the data available and requirements levied on the project. Risk analysis begins with a detailed evaluation of the risks that have been identified and approved by decision-makers for further evaluation. The objective is to gather enough information about the risks to estimate the probability of occurrence and consequence of occurrence if the risk occurs and convert the resulting values to a corresponding risk level. Risk analyses are often based on detailed information that may come from a variety of techniques, including but not limited to: analysis of plans and related documents, comparisons with similar systems, data from engineering or other models. In addition, experience and interviewing, modeling and simulation, relevant lessons-learned studies, results from tests and prototype development, sensitivity analysis of alternatives and inputs, specialist and expert judgments.

The goal of the project risk analysis step, according to National Academies of Sciences, Engineering and Medicine, (2014), is to characterize and prioritize the previously identified risks by determining:

- ✓ How likely is the risk or opportunity?
- ✓ How big is the risk or opportunity (e.g., impact)?
- ✓ What is the risk to (e.g., schedule, capital & maintenance cost, or other project goals)?
- ✓ Who assumes the risk (e.g., the airport, contractor, or other stakeholder)?

By providing answers to such questions, it is possible to classify risks based on their criticality to project success and importance to key stakeholders. Prioritizing risks in this manner can support subsequent decision making and aid in the risk response planning efforts (National Academies of Sciences, Engineering, and Medicine, 2014).

Perform Qualitative Risk Analysis

Perform Qualitative risk analysis follows risk identification and it prioritizes risks based on their likelihood of occurring and their potential impact to the project objectives. Prioritization is needed because risk identification uncovers a large number of risks having at least some potential to influence project objectives. However, many of those risks will be of such a low priority or have such a small impact that it isn't cost effective to address them, so quantities analysis allows the project team to focus on the most important risks (PMI, 2013).

The most common form of qualitative approach is the use of probability of occurrence and consequence of occurrence scales together with a risk-mapping matrix to convert the values to risk levels (Kerzner, 2009).

i. Perform Qualitative Risk Analysis: Input

Perform qualitative risk analysis inputs includes risk register, risk management plan, project scope statement, enterprise environmental factors and organizational process asset.

ii. Perform Qualitative Risk Analysis: Tools and Techniques

Risk Probability and Impact Assessment: investigates each identified risks to expose the probability and impact to all the project objectives. This data is used to prioritize or rank risks.

Probability and Impact Matrix: uses an established rating criteria and scoring formula for assigning a score to identified risks based on their probability and impact.

Risk Data Quality Assessment: risk data gathered should be assessed for accuracy, reliability and integrity.

Risk Categorization: to help in prioritization or ranking, risks can be categorized in any useful methods, such as by deliverables, phases, or technologies.

Risk Urgency Assessment: Qualitative analysis may uncover risks that are imminent. This may need fast-tracked into subsequent risk process for immediate attention.

Expert Judgment: It is required to assess the probability and impact of each risk to determine its location. Experts generally are those having experience with similar, recent projects. Gathering expert judgment is often accomplished with the use of risk facilitation workshops or interviews. The experts' bias should be taken into account in this process.

iii. Perform Qualitative Risk Analysis: Output

Risk register updates

Perform Quantitative Risk Analysis

Perform quantitative risk analysis is the process of numerically analyzing the effect of identified risks on overall project objectives. The key benefit of this process is that it produces quantitative risk information to support decision making in order to reduce project uncertainty. Perform quantitative risk analysis is performed on risks that have been prioritized by the Perform qualitative risk analysis process as potentially and substantially impacting the project's competing demands. The Perform quantitative risk analysis process analyzes the effect of those risks on project objectives. It is used mostly to evaluate the aggregate effect of all risks affecting the project. When the risks drive the quantitative analysis, the process may be used to assign a numerical priority rating to those risks individually (PMI, 2013).

According to (Kerzner) 2009, quantitative approaches include, but are not limited to, expected value, decision tree analysis, payoff matrices, and modeling and simulation. It's key importance is the use of an approved, structured, repeatable methodology rather than a subjective approach that may yield uncertain and/or inaccurate results.

While the qualitative risk assessment is a good tool to analyze individual risks, the quantitative risk analysis analyzes the combined effect of the risks in the project. This is often the only accurate assessment of the overall risk exposure in the project and should be performed where necessary (Hillson, 2009).

i. Perform Quantitative Risk Analysis: Input

Perform quantitative risk analysis inputs include risk register, risk management plan, cost management plan, schedule management plan and organization process assets.

ii. Perform Quantitative Risk Analysis: Tools and Techniques

Data Gathering and Representation techniques: additional risk data that can be gathered from estimates obtained through interviews and expert judgement.

Quantitative risk analysis and modeling techniques: Sensitivity analysis, decision tree analysis, expected monetary value, modeling, and simulation help to quantify risks and their impact.

Expert Judgement: subject matter expert and expert judgement is needed to interpret, evaluate, and present the quantitative data uncover.

iii. Perform Quantitative Risk Analysis: Output

Risk register/ Project document updates

2.1.4.4 Plan Risk Response

According to Kerzner (2009), Planning risk responses (risk handling) includes specific methods and techniques to deal with known risks and opportunities, identifies who is responsible for the risk or opportunity, and provides an estimate of the resources associated with handling the risk or opportunity, if any. It involves planning and execution with the objective of reducing risks to an acceptable level and exploiting potential opportunities.

Risk response occurs to eliminate, mitigate, deflect or accept the risk and logically will reflect the cost benefit of the risk management process (Fewings, 2005). According to PMI, (2013), the key benefit of risk response is that it addresses the risks by their priority, inserting resources and activities into the budget, schedule and project management plan as needed.

Risk Response Planning Action

PMI (2013), identifies the following three different types of actions during risk response planning;

Risk response: determines the strategy for influencing the probability and impact of the risk before it occurs. For negative risks, its aims to eliminate the risk or reduce the impact should it occur. For positive risks, the response tries to increase the probability or impact of the risk. The activities that support the risk response are taken before the risk occurs.

Contingency response / Contingency plan: it establishes what activities will take place should a specific event or situation occur and when those activities will cease. It aims to influence the impact of risk that is occurring.

Fallback Plan: it kicks in if contingency plan fails.

Risk Response Consideration

Kerzner (2009) mentions personnel that evaluate candidate risk response strategies may use the following criteria as a starting point for evaluation:

- ✓ Can the strategy be feasibly implemented and still meet the user's needs?
- ✓ What is the expected effectiveness of the response strategy in reducing program risk to an acceptable level?
- ✓ Is the strategy affordable in terms of dollars and other resources (e.g., use of critical materials and test facilities)?
- ✓ Is time available to develop and implement the strategy, and what effect does that have on the overall program schedule?
- ✓ What effect does the strategy have on the system's technical performance?

Type of risk response

i. Response for negative risks (threat)

Avoid: to eliminate the risk's probability or impact to zero. Such as; restructuring the projects activity, scope, schedule, or cost to eradicate the root causes leading to the risk. (PMI) 2013, also states that risk avoidance is a strategy for negative risks or threats that involves changing the project plan to eliminate the risk or to protect the project objectives (time, cost, scope, quality) from its impact. This can be achieved through activities including using suitable procurement option, change the method of execution an…..etc.

Mitigate if risk cannot be avoided, actions might be taken to reduce the risk's probability or its impact if it does occur. Mitigation may have the effect of reducing probability and impact (Fewings, 2005). Mitigation strategies include contingency planning, quality assurance, separation or relocation of activities and resources, contract terms and conditions and crisis management and disaster recovery plans (Cooper, 2005).

Transfer: assigns all or part of risks to third party through outsourcing, contract, insurance, warranties, guarantees or performance clauses.

ii. Response for positive risks (opportunities)

Exploit: to ensure that the risk event definitely occurs so that it's benefits can be realized. ***Enhance:*** if action can't be taken to guarantee that the opportunity will occur then response might be taken to enhance its probability or its beneficial impact if it does occur.

Share: share opportunity to third party who is best able to capitalize on it.

iii. Response for negative and positive risks

Accept: is an option for risks with low probability, low impact, or those that have no reasonable action that can be taken.

Contingent: involves a contingency plan, which will be put into effect should the risk response fail.

i. Plan Risk Response: Inputs

Plan Risk Response inputs include risk register and risk management plan.

ii. Plan Risk Response: Tools and Techniques

- ✓ Strategies for negative risk or threats: avoid, mitigate and transfer
- ✓ Strategies for positive risk or opportunities: exploit, enhance and share
- ✓ Strategies for both threats and opportunities: accept and contingent
- ✓ Contingent response strategies: are intended only if certain events occur. The most common contingent response is contingency plan, which is put into execution should the risk event occur.
- ✓ Expert Judgement

iii. Plan Risk Response: Output

Plan risk response output include risk register updates, risk management plan update, risk related contract agreement, and project document update.

2.1.4.5 Monitor and Control Risk

The monitoring and control process systematically tracks and evaluates the effectiveness of risk response actions against established metrics. Monitoring results may also provide a basis for developing additional risk response strategies, or updating existing risk response strategies, and reanalyzing known risks. In some cases, monitoring results may also be used to identify new risks and revise some aspects of risk planning. The key to the risk monitoring and control process is to establish a cost, technical performance, and schedule management indicator system over the program that the program manager and other key personnel use to evaluate the status of the program. Risk monitoring and control is not a problem-solving technique but, rather a proactive technique to obtain objective information on the progress to date in reducing risks to acceptable levels (Kerzner, 2009).

i. Monitor and Control Risk: Inputs

Monitor and control risk inputs include risk register, risk management plan, work performance information, and performance report.

ii. Monitor and Control Risk: Tools and Techniques

Risk reassessment: monitors identified risks for changes as well as watching for new risks.

Risk Audit: review the effectiveness of the project's risk management planning and may also use to evaluate how effective risk response are for identified risks.

Variance and Trend Analysis: deviation from the project plan can be indicators of the change in risk. Project variance tools, such as earned value analysis can indicate that current performance is not in line with what was planned.

Technical Performance Measurement: looks at the technical accomplishments achieved to what was planned.

Reserve Analysis: ensures that the amount of money or time in the contingency reserve is adequate for the risks remaining on the project.

Status meeting*;* project risk management should be an agenda item at periodic status meetings.

The amount of time required for that item will vary, depending upon the risks that have been identified, their priority, and difficulty of response. The more often risk management is practiced, the easier it becomes. Frequent discussions about risk make it more likely that people will identify risks and opportunities.

iii. Monitor and Control Risk: Output

Monitor and control risk output include risk register update, organizational process assets updates, change request, project management plan updates, and project document updates.

2.1.5 Risk Management in DBE

Risk-taking is an inherent element of Banking and, indeed, profits are in part the reward for successful risk taking. On the other hand, excessive and poorly managed risk can lead to losses and thus endanger the sustainability of the Bank. Risk in a banking organization refers to the possibility that the outcome of an action or event could bring adverse impacts on the institution's capital, earnings or its viability. Such outcomes could either result in direct loss of earnings and erosion of capital or may result in imposition of constraints on the bank's ability to meet its business objectives and to execute its strategies successfully. It is expected to ensure that the risks the bank is taking are warranted. Risks are considered warranted when they are understandable, measurable, controllable and within the bank's capacity to readily withstand adverse results. Sound risk management systems enable the bank to take risks

knowingly, reduce risks where appropriate and strive to prepare for a future, which by its nature cannot be predicted with absolute certainty (Risk management guideline of DBE).

Banks must have comprehensive risk management process (including board and senior management oversight) to identify, evaluate, monitor and control or mitigate all material risks and to assess their overall capital adequacy in relation to their risk profile. Whilst the types and degree of risks, an organization may be exposed depend upon a number of factors such as its size, complexity, business activities, volume etc., this section covers the most common risks DBE faces, namely: Credit Risk, Liquidity Risk, Interest Rate Risk, Foreign Exchange Rate Risk, Operational Risk and Strategic Risk.

Banks require having a sound risk management program in order to manage risks properly. A sound risk management program involves the application of four basic elements: appropriate board and executive management oversight, adequate risk management policies and procedures; appropriate risk measurement, monitoring and control functions; and comprehensive internal controls and independent audits.

"Mission of the Bank" defined Development Bank of Ethiopia is a specialized financial institution established to promote the national development agenda through development finance and close technical support to viable projects from the priority areas of the government by mobilizing fund from domestic and foreign sources while ensuring its sustainability. The Bank's risk management include objectives like; ensure that the Bank's business decisions are in line with the overall strategic objectives of the Bank, ensure that risk taking is explicit, clear and the expected payoffs reasonably compensate for the risks taken; and ensure that the Bank's overall activities are consistent with its risk appetite. Furthermore, provide an appropriate risk management framework, improve informed decision making through availing Bank-wide risk assessment information/report in a timely and comprehensive manner, promote efficient allocation of capital or ensure sufficient capital as a buffer is available to take risk; and enhance asset quality of the Bank.

The scope of the activities of Risk Management by the Bank shall primarily include risk types of credit risk, liquidity risk, interest rate risk, foreign exchange rate risk, operational risk and strategic risk.

2.1.6 Benefit of Effective Risk Management

According to PMI (2013), the objective of project risk management is not to avoid risks entirely, but to increase the probability and impact of positive events and decrease the

probability and impact of events averse to the project. Without risk taking, new methods of efficiency, originality, and competitiveness can't be achieved, so the project risk process make sure the cost of risk are weighted the benefits they provide.

Proper risk management is proactive rather than reactive. Hence, proper risk management will attempt to reduce the likelihood of an event occurring and/or the magnitude of its impact (Kerzner, 2009). Project risk management is a beneficial process that can be applied to any type, size, or complexity of project within an organization. Use of the right amount of project risk management by the correct roles with a clear level of responsibility will return benefits in better management of project scope, schedule, and budget (Marchetti, 2011).

2.1.7 Shortcomings of a Risk Management

The greatest shortcomings in risk management process for projects; the first one is a lack of data for risk identification. This is described by undefined scope of the project, WBS, timetable and budget. The other one is insufficient concretization of risk; it is a vague verbal description (example; the phrase "poor communication"), unspecified risks. The other third shortcoming current list of risks - risk management is therefore only a one-off affair on beginning of the project (Honzirokova, 2017).

Skipping across important areas of risk in the identification, subjectivity of a risk assessment, using only one method for the quantification of risk as risks should be identified as many as possible with the use of several methods combination and incorrectly proposed measures those are selected without discretion, without comparison with other possibilities are among the shortcomings of risks management.

2.2 Empirical literature review

At his study on assessing the practice of project risk management in Batu and Dukem town water supply projects, Alemu (2016) found that risk management is not implemented properly by stating projects under study did not have a carefully prepared plan for risk management, policy or guideline that direct the process to handle uncertainties that the projects may encounter. Adugna (2020) on his study of assessing project risk management practices of manufacturing projects financed by Development Bank of Ethiopia, argued that even if projects have a policy and procedure to entertain a risk management process, they lack a detail work activity regarding the practice of risk management process. According to Awoke (2020) study's on practices of risk management process and project success in case of Commercial Bank of Ethiopia IT projects, conclude that in spite, of having distinct process set to follow in risk

management process, project risk management process group are not properly and equally practiced. Most of manufacturing projects financed by Development Bank of Ethiopia have a less practice of risk planning which highly alter the success of the project (Adugna, 2020). However, according to Abera's (2018) research on the influence of project risk management practice on success of CBE's Projects, most projects had applied risk management practices such as risk identification and risk response and monitoring.

According to Jankelova et al. (2017) study on risk factors in agricultural sector illustrates, risk identification and risk definition is the first and the most important phase of the risk management. The risk character is dependent on the business activity, while the single risks are differing not only by their character, but also by the probability of their occurrence and the degree of the severity of their consequences. Risk identification imperative for viable risk management among money related foundations particularly business banks in Kenya. To oversee hazard related for propelling credit viably, business banking units and executives need to recognize dangers confronting the bank. The significant thing during risk identification is not to miss any dangers out. Risk identification and prioritization, and use of risk management tools and techniques recorded a low mean score as compared to risk analysis and risk response strategies (Abera, 2018). Meanwhile, Manyazewal (2017) states that risks are not identified and analyzed appropriately and no risk register is prepared during his study of risk management practices in Real Estate Projects in Addis Ababa. Risk management practice are implemented as an ad-hock manner of risk management while risk identification and analysis are undergone without a plan and not recurrently (Alemu, 2016). In addition, projects are missing out opportunities only focusing on identifying and mitigating negative risks and planning only for threats and disasters (Manyazewal, 2017). According to Al-Tamimi (2002), credit risk was the key concern for commercial banks in the United Arab Emirates. It was also discovered that branch manager review and financial statement analysis are the most common tools for risk detection. Establishing criteria, credit score, credit worthiness analysis, risk ranking, and collateral are the most commonly used risk management strategies. On their survey study of project risk management in engineering construction project, Skitmore & Lyons (2004) found out brainstorming to be the most commonly used techniques in risk identification. According Adugna (2020), expert judgement, planning meeting and analytical techniques are the most used methods when identifying risk.

According to Jankelova et al. 2017 in his study, the respondents perceive as the highest risk factor, influencing their business as;

- ✓ Price risks (risk of the decline in output prices, the increase in the prices of inputs)
- ✓ Production or income risks (risks connected with the weather, with the animal diseases, with the variability of the output amount, risks connected with the crop diseases, risks connected with the mechanical errors)
- ✓ Institutional risks (changes in the policy structure in the area of agriculture and in the other areas, the contracts and their violation)
- ✓ Financial risks (the increase in the cost of the capital, the lack of liquidity, the decline in the share prices, the exchange rate risks)

Meanwhile, the property risks, connected with the robbery, fire or other loses or damages of the machines, houses and other elements of the property of the farmer. Moreover, the group of the human or personal risks in the form of the risk of the disease, injury or death of the workers, their carelessness, a personal crisis or the management expertise are perceived at a lower level of importance. Various strategies can be utilized in risk identification. The risk attitudes were examined also in the extensive study on the sample of small Turkish farmers. The author points out the fact, that a better understanding of their risk preferences and the mutual link of the attitudes to the risk with variety of the agriculture is important for the decision making, the creation of the support strategies and for the development of the insurance tools for the mitigation of the negative consequences (Tshoni, 2015). The ability of early detection and effective management of the risks is an integral part of the strategic management of every agricultural organization (Jankelova et al., 2017).

Lack of using proper tools and techniques as recommended in project management literature and lack of knowledge and expertise in using the tools and techniques both on the project teams side and project managers side, has been identified as challenges raised by respondent during risk analysis process (Awoke, 2020). Probability/impact rating matrix, expert judgment and risk probability and impact assessment are highly used tools and techniques during risk analysis of manufacturing projects in Development Bank of Ethiopia (Adugna, 2020) and he also depicted risk response practiced in manufacturing projects are insurances, performance bonds, warranties and guarantees.

According to Awoke (2020) regarding risk response and treatment mechanisms, the risk mitigation is the most frequently used risk response method followed by risk transfer; risk elimination and risk retention - with the use of contingencies and contractual transfer preferred over insurance. In agriculture, there are discussions about various strategies of reducing the adverse results of the risks. Most often it is about the diversification, insurance, debt

management, integration (Akcaoz and Ozkan 2005; Lagerkvist 2005; Sulewski and Kloczko-Gajewska 2014). The flexibility and caution, cost reduction, division of labour and guidance, membership in the corporate respectively farmers union, and prevention were also mentioned (Hayran & Gul, 2015). Jankelovaet al. (2017) argued the most important strategies of risk management include diversification, conclusion of production contracts, vertical integration, and choice of products with a low level of risk respectively. Miller et al. (2004) from the outcomes of the study, illustrates many farmers do not have a sufficient knowledge and the positive tools of the measures for the risk reduction. Undervalued are particularly the strategies, which concern the cooperation, mainly in the small farmers segment, what probably results from the general unwillingness of cooperation among these farmers. The most popular tool, which should be a trend of the future, is insurance. Diversification plays a significant role in the multifunctional understanding of the agriculture. Its support towards the non-agricultural activities, which is at the same time one of the goals of the EU Common Agricultural Policy, is focused at the keeping of farmers in rural areas. Schope (2011) considers the diversification as an essential feature of the agricultural structure change. According to him, it is economically meaningful to diversify when we want to settle the risk. Rowland (2009) points out that the diversification often offers a significant space for the improvement of the economic vitality of many agricultural enterprises, and at the same time, it decreases their dependence on subsidies, respectively subventions. Rowland also states that we can understand diversification as the business use of the agricultural resources on the non-agricultural purposes for the commercial profit. Diversification reduces, according to Špička (2006), the income risk, but it is more demanding for the initial capital and management capabilities. Regarding the long-term character of the production in agriculture, it is necessary to eliminate the income risks in the agro-sector by the balanced sales during the whole year. Some studies have examined more than two risks jointly, often using simulation models that take a system view (Finger, 2012; Djanibekov and Finger, 2018). Taking a system (or whole-farm) view through using simulation models has been considered one of the best approaches to examine risks since at least the 1970s (Hardaker & Lien, 2005). A recent example is the use of a recursive programming model to examine farmer responses to production, market, and institutional risks in Uzbekistan (Djanibekov & Finger, 2018). In this example, production risks came from irrigation water variability and market risks stemmed from price fluctuations. Variability in irrigation water and prices were based on realized observations over time, and the institutional risks were considered using scenarios in the programming model.

Birru (2020) in her study, illustrates that project risk monitoring and controlling practice of Zemen Bank Headquarter Building Construction Project, were poorly practiced while the practice towards risk analysis was found to be relatively good. There was no project risk analysis guidance developed to identify the level of risk that will be consistently applied across the project (Birru, 2020). Mequanint (2018) conducted an assessment on the risk management practices in World Vision Ethiopia Wash construction project and argued that risks are properly monitored and well controlled. However, unanticipated events with considerable impacts on farmers continue to occur (Just, 2001), which suggests that the nature of risk has changed over time. The challenges to the agricultural sector from a growing world population, from changing diets with higher demand for animal-source foods, and from climate change, make managing multiple risks more important than ever. Thus, risk outcomes can have cascading effects where one type contributes to another type occurring for example, excessive rainfall during harvest is an event that can engender another set of risks such as financial risks associated with being unable to repay loans (Pelka, 2015). Moreover, Just (2003) argues that agricultural risk research "has failed to convince the larger profession of the importance of risk averse behavior", that "agricultural risk research has focused too much on problems in which risk is less likely to be important", and that there has been an over emphasis on "characterization of the production problem that does not support risk research". In addition, majority of the studies that are done in Ethiopia regarding project risk management practice are done on construction risk management therefore this study will analyses risk management practice of agricultural Projects in Development Bank of Ethiopia.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design and Approach

The choice of research design primarily depends on the objectives of the study that are going to be attained. This study used descriptive research design approach. Descriptive research examines a situation as it is; it does not involve changing or modifying the situation under investigation, nor does it intend to detect cause-and-effect relationships (Leedly & Ormrod, 2005).

The study is quantitative in its approach; the quantitative data research relies on the measurement and analysis of statistical data to produce quantifiable conclusions. Therefore, for this study quantitative research approach is used to assess risk management practice of agricultural projects financed by Development Bank of Ethiopia.

3.2 Population and Sampling Design

3.2.1 Sampling Design

A group of elements with similar noticeable characteristics from which conclusions are made is referred to as population (Ngechu, 2004). For assessing risk management practice of agricultural projects financed by Development Bank of Ethiopia, it is mandatory to address the number of agricultural projects under implementation and operation. There are 50 agricultural projects administered at head office. Targeted population includes; 50 project manager of agricultural projects, and 9 directors, 30 team managers and 213 project officers of the loaning unit. Therefore, the total target population of this study is 302. The populations size are taken from the loaning unit includes directorates that have direct encounter with the project under study and these includes;

1. Customer relation and management directorate
2. Project appraisal directorate
3. Project rehabilitation and loan recovery directorate
4. Risk and compliance directorate

3.2.2 Sample size

Even though, the result will be more accurate when taking all the population, due to factors such as time, cost and energy, census for all projects was not possible. Therefore, sampling

technique is employed to select the sample size. Accordingly, the researcher employed Yamane's Formula of Sample size determination.

$$n = \frac{N}{1 + N(e)^2}$$

Where; e - plus or minus of 5% precision, 95% confidence level and p=0.5,

N = total population (302) and

n = sample size

$$n = \frac{302}{1 + (302 * (0.05)^2)}$$

$$n = 172.089 \approx 172$$

Based on this formula the sampling size comes 172 and the researcher distributed proportional number of questionnaire for the project managers of the project, directors, team managers, and project officers of the Bank.

3.3 Sampling Technique

The study has used stratified sampling techniques, because this technique assist in minimizing bias when dealing with the population. With this technique, the sampling frame can be organized into relatively homogeneous groups (strata) before selecting elements for the sample. Since each stratum is more homogeneous than the total population, estimates that are more precise were able to get for each stratum and by estimating more accurately each of the component parts; and better estimate of the whole could be obtained from each stratum randomly. The strata are

1. Project managers of agricultural projects
2. Directors of the Bank loaning unit
3. Team mangers of the Bank loaning unit and
4. Credit officials in the Bank loaning unit.

The sample size of each stratum is distributed evenly across each sub group.

Table 3.1 Sample size distribution across each stratum

No.	Strata	Population	Percent (%)	Sample size
1	Director	9	2.98	5
2	Team manager	30	9.93	17
3	Project officers	213	70.53	121
4	Project manager of the project	50	16.56	28
	Total	**302**	**100**	**172**

3.4 Data Source and Collection Instrument

Data collection is a process of collecting information from all the relevant sources to find answers to the research problem, test the hypothesis and evaluate the outcomes. Data collection methods can be divided into two categories: primary methods of data collection and secondary methods of data collection. In this study, the researcher used both primary and secondary data collection methods. Questionnaires is used as a tool for primary data collection and the questionnaire was accompanied with a cover letter that describe the purpose of the study. In addition, secondary data was obtained from the bank's annual reports, internet, journals and books. The obtained data is used for analysis purposes.

The questionnaires were overseen using drop and pick method. The overviews were used in light of the fact that they grant the respondents to give their responses in a free space and help the analyst gather information that would not have been given out had interviews been used. Also, the respondents were mentioned to assess the project risk management practices and process on a five point Likert scale as (1) Strongly Disagree, (2) Disagree, (3) Neutral , (4) Agree And (5) Strongly Agree. Respondents were also mentioned to assess the lists of inputs, tools & techniques using a Yes (1) or No (2) questions. The elements and the lists of inputs and tools & techniques for risk management planning, identification, analysis, response and monitoring and control is derived from a guide to Project Management Body of Knowledge (PMBOK guide).

3.5 Method of Data Analysis

Considering the requirements and objectives that have been discussed, this study used descriptive research design to assess risk management practice of agricultural projects. Following data collection, Statistical Package for Social Science (SPSS) was employed to analyze the data obtained from primary sources. Descriptive statistics such as frequency distribution, median and percentage was used to analyze the quantitative data and results are presented in tabular form.

Besides, to examine practice and process of project risk management in the case of Agricultural projects financed by DBE Likert-type scale going from strongly disagree=1, disagree=2, neutral=3, agree=4 and strongly disagree=5 were utilized. Likert scales are called summative scales. In an ordinal scale, reactions can be appraise or positioned, however the separation between reactions is not quantifiable. Likert scaling is a bipolar scaling strategy, estimating either positive or negative reaction to an announcement.

What's more and important, to make simple understanding for the level of respondents' conclusion and understanding for every announcement, the results of the median value and average percent of respondents are summarized and discussed.

3.6 Validity and reliability

Validity defined as the extent to which data collection method or methods accurately measure what they were intended to measure and it is concerned with whether the findings are really about what they appear to be about. (Sounders et al., 2012). Numbers of different steps will be taken to ensure the validity of the study:

- Data was collected from the reliable sources, from respondent who has experiences in project management. In addition, question were made based on literature review and frame of reference to ensure result validity.

The Cronbach's alpha coefficient is an indicator of internal consistency of the scale. Questionnaire are prepared in a way that is closely related to research question and appropriate and careful data collection method will be used. Cronbach's Alpha test of reliability is in social science studies is important (Taber, 2018). As suggested by the author and utilized by some other studies, an Alpha value of less 0.6 is not considered to be reliable. The project study computed the Cronbach's Alpha value of the project as a whole. Each factor is analyzed using factor analysis of SPSS software.

As indicated in table 3.2, the test result shows an excellent test of reliability for risk identification and qualitative risk analysis process whereas, a very good test of reliability for the remaining items. It can be assumed therefore that the data sets collected for the study are reliable assuming the common Cronbach's Alpha" test of reliability.

Table 3.2 Reliability statistics

Description	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No of Items
General project risk management process	0.83	0.83	6
Risk planning	0.85	0.85	4
Risk identification	0.91	0.91	7
Qualitative risk analysis	0.91	0.91	5
Quantitative risk analysis	0.81	0.81	4
Risk response	0.87	0.87	7
Risk monitoring and control	0.85	0.85	8

3.7 Ethical Consideration

Ethics refers to the appropriateness of the researcher's behavior in relation to the rights of those who become the subject of the research work or are affected by it. Research ethics therefore relates to questions about how we formulate and clarify our research topic, design our research and gain access, collect data, process and store our data, analyze data and write up our research findings in a moral and responsible way (Saunders, Lewis, & Thornhill, 2009). Ethical considerations are expected to be involved in any kind of research study. This paper therefore took into consideration of those ethical issues on access and use of data, analysis and report of the findings in a moral and responsible way. Confidentiality and anonymity of the voluntary respondents was also guaranteed.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presented and analyzed the data collected through primary data and secondary sources. The main emphasis of this project work is to assess risk management practice on agricultural Projects financed by Development Bank of Ethiopia. Quantitative analysis techniques, ranging from creating simple tables or diagrams that showing the frequency of occurrences through establishing statistical relationships between variables to simple statistical modeling, are used to analyze the collected data. Thus, the analysis of the data is made accessible by means of percentages, tables and figures with simple mathematical calculations.

The survey was conducted by distributing questionnaires to directors, team managers, project officers from the bank, project managers of agricultural projects. The questionnaires were distributed to 172 respondents.

4.1 Response Rate

From 172 questionnaire distributed to respondent, 137 respondents filled and returned which accounts 80 % of the all-out respondents.

4.2 Demographic Characteristics of the respondents

4.2.1 Educational Background of Respondents

With respect to educational qualification of the respondents, the information delineates that the dominant parts of respondents are Bachelor degree holders which accounts 51.8% of the respondents while the rest 48.2 % of the respondents are Master's Degree holders. The outline is shown in Table 4.1.

Table 4.1 Summary of Educational Background of Respondents

		Frequency	Percent	Valid Percent
Valid	Degree	71	51.8	51.8
	Masters	66	48.2	48.2
	Total	137	100.0	100.0

4.2.2 Work Position of the Respondents

As show in the table 4.5, Directors, project managers and team managers took 27%, whereas project contact officials (experts) spread 73% rate. Obviously, large portions of the respondents are project contact officers and the rest of the respondents are on administrative level both at a

project and Bank level. This could be credited to the way that the greater part of the projects from the inception stage up to completion go through them and they have more exposure to the status of undertakings than some other staffs situated in the directorates of the Bank.

Table 4.2 Summary of Work Position of Respondents

		Frequency	Percent	Valid Percent
Valid	Managerial	37	27.0	27.0
	Professional	100	73.0	73.0
	Total	137	100.0	100.0

4.2.3 Working Experience of Respondents

As depicted in the table below, experience equal and below 2 years accounted only 9.5%, 3-5 years took 38.7 % and working experience of the respondents above 6-10 years accounts for 27.7% and above 10 years covers 24.1%. This means, the greater share of the respondents has adequate experience and knowhow about the project management aspects.

Table 4.3 Summary of Working Experience of Respondent

		Frequency	Percent	Valid Percent
Valid	<=2	13	9.5	9.5
	3-5	53	38.7	38.7
	6-10	38	27.7	27.7
	>10	33	24.1	24.1
	Total	137	100.0	100.0

4.3 Project Risk Management Processes and Practices

This type of study gives the detail result about the project risk management procedure and practices of the agricultural projects financed by Development Bank of Ethiopia dependent on the respondents' data and analysis.

In this area, the inquiries raised for the respondents contain two types of inquiries. The first is questions that need a Five point Likert scale. The reactions were estimated by a five point Likert scale; 1= Strongly disagree, 2= Disagree, 3=Neutral 4=Agree and 5= strongly agree.

As discussed in the earlier chapter of this research, to analyze the weigh and inclination of the respondents opinion about the practice of risk management practice of agricultural projects financed by DBE the median and individual and average percent of response of elements are summarized and discussed.

4.3.1 Assessment of the General Project Risk Management Practice

Respondents were asked to forward their understanding on general project risk management practice based on the six elements presented on the following table. Furthermore, the median and valid percent scores are identified for each element based on their response.

Table 4.4 Project Risk Management Practice

Description	N	Median	Percent of responses				
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The project has a well-thought-out risk management plan	137	3.00	8.0	29.9	20.4	38.7	2.9
The required resources and costs for the project risk management processes were estimated and included in the project budget	137	3.00	7.3	34.3	16.1	40.1	2.2
Activities for risk management were specifically identified, defined and included in the project's schedule	137	3.00	5.1	32.8	13.9	42.3	5.8
There is documented risk register system	137	2.00	18.2	47.4	15.3	18.2	.7
The project has team of experts with relevant experience in project risk management	137	3.00	6.6	32.8	17.5	39.4	3.6
There is a policy and procedure that guide the project team to go through a disciplined risk management process	137	4.00	6.6	22.6	15.3	47.4	8.0
Average		3.00	8.64	33.33	16.42	37.71	3.89
			Sum	**41.97**		**Sum**	**41.61**

As it can be observed from the above table, half of the respondents agreed and strongly agreed that, there is a policy and procedure that guide the project team to go through a disciplined risk management process with a median of 4. Whereas, half of the respondents choose disagreed and strongly disagreed that, there is a document risk register system with a median of 2. On elements such as; activities for risk management were specifically identified, defined and included in the project's schedule, the project has team of experts with relevant experience in project risk management, and the project has a well-thought-out risk management plan 48%, 43% and 42% of the respondent agreed and strongly agreed on these issues respectively. While 38%, 39% and 39% of the respondent disagreed or strongly disagreed on those elements and the rest remain neutral. Furthermore, the average median of those elements is observed to be 3.00 whereas, an average of 41.61% of respondents agreed and strongly agreed, 41.97% of respondents disagreed and strongly disagreed while the rest remain neutral on those elements.

4.3.2 Assessment of Project Risk Panning practice

Respondents were asked to forward their understanding on project risk planning practice based on the four elements presented on the following table. Furthermore, the median and valid percent scores are identified for each element based on their response.

As it can be observed from table 4.5, 45% and 39% of the respondents strongly agree and agreed on elements like, planning meetings were hold to develop the risk management plan and risk management methodology as well as the tools and data sources that are used in the risk management process was established. On the contrary, 36% of respondents disagreed or strongly disagreed on those two issues while the rest remain neutral. On the other hand, 45% of the respondents disagreed or strongly disagreed on issue of; all main stakeholders were invited to participate and the risk management plan received their approval and support whereas, 33% of respondents agreed or strongly agreed while the rest remain neutral. Each 39% of respondents either agreed or disagreed that risk plan ensures that the degree, type, and visibility of risk management that commensurate with the project plan. Furthermore, the average median of those elements is observed to be 3.00 and an average of 39.05% of respondents agreed or strongly agreed whereas, 38.87% of respondents disagreed or strongly disagreed while the rest remain neutral on those elements.

Table 4.5 Project Risk Planning Practice

Description	N	Median	**Percent of responses**				
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Planning meetings were hold to develop the risk management plan	137	3.00	4.4	31.4	19.0	40.9	4.4
All main stakeholders were invited to participate, and the risk management plan received their approval and support.	137	3.00	11.7	32.8	22.6	31.4	1.5
The risk plan ensures that the degree, type, and visibility of risk management that commensurate with the project plan	137	3.00	13.9	25.5	21.9	32.8	5.8
The risk management methodology was established, as well as the tools and data sources that are used in the risk management process.	137	3.00	10.9	24.8	24.8	38.0	1.5
Average		3.00	10.22	28.65	22.08	35.77	3.28
			Sum	**38.87**		**Sum**	**39.05**

4.3.3 Assessment of Project Risk Identification practice

Respondents were asked to forward their opinion on project risk identification practice of agricultural projects financed by DBE based on seven elements presented on the following table. Furthermore, the median and valid percent scores are identified for each element based on their response.

As it can be observed from table 4.6, half of the respondents agreed and strongly agreed on elements such a; the project risks were identified based on established risk identification process for projects by experts, risks are identified throughout the project lifecycle, the project

team is involved in the risk identification process, with a median of 4. In addition, for elements such as; all key project participants involved in risk identification, a clear description of the risks within the cause and effects are understood and documented and scope statement, milestones, WBS and deliverables of the project are used to identify risks are identified, 41%, 44% and 37% of the respondents agreed or strongly agreed respectively. However, 38%, 35% and 33% of respondent disagreed or strongly disagreed while the rest remain neutral. Furthermore, the average median of those elements is observed to be 3.43 and an average of 46.40% respondents agreed or strongly agreed whereas, 32.43% of respondents disagreed or strongly disagreed while the rest remain neutral on those elements.

Table 4.6 Project Risk Identification Practice

Description	N	Median	**Percent of responses**				
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The project risks were identified based on established risk identification process for projects by experts	137	4.00	5.8	22.6	16.1	48.2	7.3
Risks are identified throughout the project lifecycle	137	4.00	2.2	28.5	13.9	45.3	10.2
The project team is involved in the risk identification process	137	4.00	5.8	21.2	21.9	40.9	10.2
All key project participants involved in risk identification	137	3.00	6.6	31.4	21.2	31.4	9.5
A clear description of the risks within the cause and effects are understood and documented	137	3.00	11.7	23.4	21.2	37.2	6.6
Scope statement, milestones, WBS and deliverables of the project are used to identify risks	137	3.00	6.6	26.3	29.9	32.1	5.1
Risk register is prepared and used for risk identification process in the project	137	3.00	5.8	29.2	24.1	33.6	7.3
Average		3.43	6.36	26.07	21.17	38.37	8.03
			Sum	**32.43**		**Sum**	**46.40**

4.3.4 Assessment of Project Risk Analysis practice

4.3.4.1 Qualitative Risk Analysis

Respondents were asked to forward their opinion on qualitative risk analysis practice of agricultural projects financed by DBE based on five elements presented on the following table. Furthermore, the mean scores are identified for each element based on their response.

As it can be observed from table 4.7, 42% of the respondents strongly agree or agreed on project has been gone through established qualitative risk assessment elements whereas, 39% of respondents disagreed or strongly disagreed and the rest remain neutral. On the other hand respondents equally agreed and disagreed on the issue, project had risk matrix that defines probability of list of risks identified while 16% remain neutral. On the contrary, 41%, 45% and 44% of respondents disagreed or strongly disagreed on elements such as; assumptions made

for during the analysis of identified risks was clearly stated, assessment of risk was done by factual information and data and project documents were updated after risks were analyzed. Whereas 37%, 39% and 31% of respondent strongly agreed or agreed on those issue while the rest remain neutral. Furthermore, the average median of those elements is observed to be 3.00 and an average of 38.39% respondents agreed or strongly agreed whereas, 42.19% of respondents disagreed or strongly disagreed while the rest remain neutral on those elements.

Table 4.7 Qualitative Risk Analysis

Description	N	Median	Percent of responses				
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The project has been gone through established qualitative risk assessment	137	3.00	16.1	23.4	18.2	40.9	1.5
The project had risk matrix that defines probability of list of risks identified and their impact	137	3.00	2.2	40.1	15.3	35.8	6.6
Assumptions made for during the analysis of identified risks was clearly stated	137	3.00	19.0	21.9	21.9	32.8	4.4
The assessment of risk was done by factual information and data	137	3.00	12.4	32.1	16.8	33.6	5.1
Project documents were updated after risks were analyzed qualitatively	137	3.00	19.7	24.1	24.8	27.0	4.4
Average		3.00	13.87	28.32	19.42	34.01	4.38
			Sum	**42.19**		**Sum**	**38.39**

4.3.4.2 Quantitative Risk Analysis

Respondents were asked to forward their opinion on quantitative risk analysis practice of agricultural projects financed by DBE based on four elements presented on the following table. Furthermore, the median and valid percent scores are identified for each element based on their response.

As it can be observed from table 4.8, 49%, 47% and 48% of the respondents strongly disagree or disagreed on elements such as; identified risks were numerically analyzed to show the effect on overall objectives of the project, risk are clearly identified and enabled to identify realistic and achievable project cost, schedule, scope and targets and project document has been updated after risks were analyzed quantitatively. On the contrary, 40%, 38% and 26% of respondents agreed or strongly agreed on those issues while the rest remain neutral. On the other hand, respondents equally agreed and disagreed on the issue, project risk has been quantified with standard process accounting for 34% each while 32% remain neutral. Furthermore, the average median of those elements is observed to be 3.00 and an average of 34.49% respondents agreed

or strongly agreed whereas, 44.71% of respondents disagreed or strongly disagreed while the rest remain neutral on those elements.

Table 4.8 Quantitative Risk Analysis

Description	N	Median	Percent of responses				
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The project risk has been quantified with standard process	137	3.00	8.0	26.3	31.4	31.4	2.9
Identified risks were numerically analyzed to show their effect of on overall objectives of the project	137	3.00	7.3	41.6	10.9	38.0	2.2
Projects risk are clearly identified and enabled to identify realistic and achievable project cost, schedule, scope and targets	137	3.00	18.2	29.2	14.6	32.8	5.1
The project document has been updated after risks were analyzed quantitatively	137	3.00	18.2	29.9	26.3	22.6	2.9
Average		3.00	12.96	31.75	20.80	31.20	3.28
			Sum	**44.71**		**Sum**	**34.49**

4.3.5 Assessment of Risk Response practice

Respondents were asked to forward their opinion on project risk response practice of Agricultural projects financed by DBE based on seven elements presented on the following table. Furthermore, the median and valid percent scores are identified for each element based on their response.

Table 4.9 Project Risk Response Practice

Description	N	Median	Percent of responses				
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The project has planned responses as opposed to considering risks as they arise.	137	3.00	2.2	30.7	23.4	40.9	2.9
The project has developed strategies in order to prevent or mitigate all the identified risks	137	3.00	10.2	25.5	19.7	39.4	5.1
Assigning of one or more persons for each agreed to risk response is in place	137	3.00	4.4	32.1	21.2	38.0	4.4
A decision tree analysis method is in place to choose the most appropriate response	137	3.00	8.0	29.9	32.1	27.7	2.2
Options and actions are developed to enhance opportunities and to reduce threats to project objectives	137	4.00	6.6	16.8	17.5	55.5	3.6
Risks are addressed by their priority	137	4.00	5.1	23.4	15.3	45.3	10.9
An allocation of contingency reserve for cost and time considered	137	3.00	12.4	29.9	16.1	35.0	6.6
Average		3.29	6.99	26.90	20.75	40.25	5.11
			Sum	**33.89**		**Sum**	**45.36**

As it can be observed from table 4.9, half of the respondents agreed and strongly agreed on elements such as; options and actions are developed to enhance opportunities and to reduce threats to project objectives and risks are addressed by their priority with a median of 4.

In addition, for elements such as; project has planned responses as opposed to considering risks as they arise, project has developed strategies in order to prevent or mitigate all the identified risks and assigning of one or more persons for each agreed to risk response is in place, the respondents agreed or strongly agreed accounting 44%, 45% and 42 % respectively. Whereas, 33%, 36% and 36% of them disagreed or strongly disagreed while the rest remain neutral on those issue. On the contrary, 38% of respondents disagreed or strongly disagreed that decision tree analysis method is in place to choose the most appropriate response whereas, 30% of them agreed or strongly agreed while 32% remain neutral. Moreover, respondents equally agreed and disagreed on consideration of contingency reserve allocation for cost and time accounting 42% each while 16% remain neutral. Furthermore, the average median of those elements is observed to be 3.29 and an average of 45.36% respondents agreed or strongly agreed whereas, 33.89% of respondents disagreed or strongly disagreed while the rest remain neutral on those elements.

4.3.6 Assessment of Risk Monitoring and Control practice

Respondents were asked to forward their opinion on project risk monitoring and control practice of Agricultural projects financed by DBE based on eight elements presented in table 4.10. Moreover, the median and valid percent scores are identified for each element based on their response.

As it can be observed from table 4.10, half of the respondents agreed and strongly agreed on elements such as; risks that occur within the project are controlled in a way that goes with the goal and objective of the project, new risks are identified and residual risks are monitored and risk monitoring and control is treated as a continuous process in the project with a median of 4. Whereas, half of the respondents disagreed and strongly disagreed that, project management plan, project documents and organizational process assets are updated after monitoring and control process with a median of 2. In addition, for elements such as; identified risks are tracked and reassessed and effectiveness of risk management process is evaluated throughout the project the respondents agreed or strongly agreed accounting 49% and 44% respectively. Whereas, 39% and 31% of them disagreed or strongly disagreed while the rest remain neutral on those issue. On the contrary, 43% and 44% of respondents disagreed or strongly disagreed

that project team hold periodic meetings specifically for risk discussions and project team performs reserve analysis whereas, 41% and 32% of them agreed or strongly agreed respectively while the rest remain neutral.

Furthermore, the average median of those elements is observed to be 3.25 and an average of 47.26% respondents agreed or strongly agreed whereas, 36.95% of respondents disagreed or strongly disagreed while the rest remain neutral on those elements.

Table 4.10 Project Risk Monitoring and Control Practice

Description	N	Median	**Percent of responses**				
			Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Risks that occur within the project are controlled in a way that goes with the goal and objective of the project	137	4.00	9.5	21.9	10.2	53.3	5.1
Identified risks are tracked and reassessed	137	3.00	13.9	25.5	11.7	45.3	3.6
New risks are identified and Residual risks are monitored	137	4.00	7.3	28.5	13.1	46.7	4.4
Project team hold periodic meetings specifically for risk discussions	137	3.00	15.3	27.7	16.1	36.5	4.4
Effectiveness of risk management process is evaluated throughout the project	137	3.00	2.9	27.7	25.5	34.3	9.5
Risk monitoring and control is treated as a continuous process in the project	137	4.00	2.2	17.5	13.9	56.2	10.2
Project management plan, project documents and organizational process assets are updated after monitoring and control process	137	2.00	20.4	31.4	11.7	35.0	1.5
Project team performs reserve analysis	137	3.00	15.3	28.5	24.1	27.7	4.4
Average		3.25	10.86	26.09	15.78	41.88	5.38
			Sum	**36.95**		**Sum**	**47.26**

4.4 Inputs and Tools and Techniques used for Risk Management Processes

This enquiry is a Yes (1) or No (2) questions and their outcome is introduced through frequencies while, the lists of inputs, tools and techniques for risk management planning, identification, analysis, response and monitoring and control derived from a guide to Project Management Body of Knowledge (PMBOK guide). Accordingly, the inputs and, tools and techniques used for risk management process in agricultural projects financed by DBE were assessed.

4.4.1 Project Risk Planning

4.4.1.1 Inputs

Respondents were asked to forward their opinion on the input used for project risk planning based on the guide from project management body of knowledge. Seven inputs were depicted and their responses are summarized on the following table.

As it can be observed from table 4.11, most respondents best chosen input used for project risk planning includes organization's risk management policies, defined roles and responsibilities and work breakdown structure accounting 23.5%, 23% and 16.2% of the response respectively. Moreover, template for the organization's risk management plan, project charter, stakeholder risk tolerances and stakeholder register are selected by respondents as an input for risk planning covering 12.3%, 10.6%, 8.7% and 5.6% of the response respectively.

Table 4.11 Inputs used for project Risk Planning

		Responses		Percent of Cases
		N	Percent	
Input used for project risk planning	Defined roles and responsibilities	82	23.0%	59.9%
	Stakeholder register	20	5.6%	14.6%
	Stakeholder risk tolerances	31	8.7%	22.6%
	Template for the organization's Risk management plan	44	12.3%	32.1%
	Organization's risk management policies	84	23.5%	61.3%
	Work breakdown structure	58	16.2%	42.3%
	Project charter	38	10.6%	27.7%
Total		357	100.0%	260.6%

4.4.1.2 Tools and Techniques

Respondents were asked to forward their opinion on tools and techniques used for project risk planning based on the guide from project management body of knowledge. Three tools and techniques were depicted and their responses are summarized on the following table.

Table 4.12 Tools and Techniques used for Project Risk Planning

		Responses		Percent of Cases
		N	Percent	
Tools and techinque used for risk planning	Analytical technique	64	32.5%	46.7%
	Expert judgment	80	40.6%	58.4%
	Planning Meeting	53	26.9%	38.7%
Total		197	100.0%	143.8%

As it can be observed from the above table, most respondents best chosen tools and techniques used for project risk planning are expert judgement, Analytical techniques and planning meeting accounting 40.6%, 32.5% and 26.9% of the response respectively.

4.4.2 Project Risk Identification

4.4.2.1 Inputs

Respondents were asked to forward their opinion on the input used for project risk identification based on the guide from project management body of knowledge. Six inputs were depicted and their responses are summarized on the following table.

As it can be observed from table 4.13, most respondents best chosen input used for project risk identification includes risk management plan, historical information and enterprise environmental factors accounting 23.6%, 19% and 15.3% of the response respectively. Moreover, respondents select product description, project planning outputs and risk categories as an input for risk planning covering 14.8%, 14.3%, and 13% of the response respectively.

Table 4.13 Inputs used in Project Risk Identification

		Responses		Percent of Cases
		N	Percent	
Inputs used in project risk identification	Risk management plan	91	23.6%	66.4%
	Product description	57	14.8%	41.6%
	Enterprise environmental factors	59	15.3%	43.1%
	Historical Information	73	19.0%	53.3%
	Project planning outputs	55	14.3%	40.1%
	Risk categories	50	13.0%	36.5%
Total		385	100.0%	281.0%

4.4.2.2 Tools and Techniques

Respondents were asked to forward their opinion on tools and techniques used for project risk identification based on the guide from project management body of knowledge. Seven tools and techniques were depicted and their responses are summarized on the following table.

As it can be observed from table 4.14, most respondents best chosen tools and techniques used for project risk identification includes SWOT analysis, documentation reviews, information gathering techniques and checklist analysis accounting 24.4%, 21.3%, 16.6% and 15.2% of the response respectively. Moreover, respondents select assumptions analysis, brainstorming and diagramming analysis as an input for risk planning covering 10.8%, 6.6%, and 5.4% of the response respectively.

Table 4.14 Tools and Techniques used for Project Risk Identification

		Responses		Percent of Cases
		N	Percent	
Tools and techniques used for project risk identification	Documentation reviews	91	21.3%	66.4%
	SWOT analysis	104	24.4%	75.9%
	Information gathering techniques	70	16.4%	51.1%
	Brainstorming	28	6.6%	20.4%
	Checklist analysis	65	15.2%	47.4%
	Diagramming analysis	23	5.4%	16.8%
	Assumptions analysis	46	10.8%	33.6%
Total		427	100.0%	311.7%

4.4.2.3 Risk Category

Respondents were asked to forward their opinion on risk categories encountered by them while administering Agricultural projects financed by DBE. Their response is summarized in table 4.15 accordingly.

Table 4.15 Risk Categories of Agricultural Projects

		Responses		Percent of Cases
		N	Percent	
Risk catagories encountered in agricultural projects	Production risk	108	34.2%	78.8%
	Legal risk	42	13.3%	30.7%
	Marketing risk	57	18.0%	41.6%
	Human risk	43	13.6%	31.4%
	Financial risk	66	20.9%	48.2%
Total		316	100.0%	230.7%

As it can be observed from the above table, most respondents replied production risk, Financial risk and marketing risk as the most encountered risk during their time in administrating Agricultural projects accounting 34.2%, 20.9%, and 18% of the response respectively. Moreover, respondents select human risk and legal risk as risk type encountered while administrating such projects covering 13.6%, and 13.3% of the response respectively.

4.4.3 Project Risk Analysis

4.4.3.1 Qualitative Risk Analysis

4.4.3.1.1 Inputs

Respondents were asked to forward their opinion on the input used for qualitative risk analysis based on the guide from project management body of knowledge. Seven inputs were depicted and their responses are summarized on the following table.

As it can be observed from table 4.16, most respondents best chosen input used for qualitative risk analysis includes identified risks, project status, risk management plan and project type accounting 21%, 19.8%, 17.4% and 16.7% of the response respectively. Moreover, respondents select scales of probability and impact assumptions, risk register and data precision as an input for qualitative risk analysis covering 9.5%, 8.8%and 6.9% of the response respectively.

Table 4.16 Inputs used for Qualitative Risk Analysis

		Responses		Percent of Cases
		N	Percent	
Input used for qualitative risk analysis	Risk management plan	73	17.4%	53.3%
	Project status	83	19.8%	60.6%
	Project type	70	16.7%	51.1%
	Scales of probability and impact assumptions	40	9.5%	29.2%
	Identified risks	88	21.0%	64.2%
	Risk register	37	8.8%	27.0%
	Data precision	29	6.9%	21.2%
Total		420	100.0%	306.6%

4.4.3.1.2 Tools and Techniques

Respondents were asked to forward their opinion on tools and techniques used for qualitative risk analysis based on the guide from project management body of knowledge. Five tools and techniques were depicted and their responses are summarized on the following table.

Table 4.17 Tools and Techniques used for Qualitative Risk Analysis

		Responses		Percent of Cases
		N	Percent	
Tools and techniques used for qualitative risk analysis	Risk probability and impact assessment	87	27.6%	63.5%
	Project assumptions testing	51	16.2%	37.2%
	Data precision testing (like Quality, reliability and integrity of data)	35	11.1%	25.5%
	Probability/ impact risk rating matrix	62	19.7%	45.3%
	Expert judgment	80	25.4%	58.4%
Total		315	100.0%	229.9%

As it can be observed from the above table, most respondents best chosen tools and techniques used for qualitative risk analysis includes risk probability and impact assessment, expert judgment and probability/ impact risk rating matrix accounting 27.6%, 25.4%and 19.7% of

the response respectively. Moreover, respondents select project assumptions testing and data precision testing as tools and techniques for qualitative risk analysis accounting 16.2% and 11.1% of the response respectively.

4.4.3.2 Quantitative Risk Analysis

4.4.3.2.1 Inputs

Respondents were asked to forward their opinion on the input used for quantitative risk analysis based on the guide from project management body of knowledge. Five inputs were depicted and their responses are summarized on the following table.

Table 4.18 Inputs used for Quantitative Risk Analysis

		Responses		Percent of Cases
		N	Percent	
Input used for quantitative risk analysis	Risk management plan	78	22.1%	56.9%
	List of prioritized risks	74	21.0%	54.0%
	Expert judgment	62	17.6%	45.3%
	Identified risks and list	88	24.9%	64.2%
	Historical information	51	14.4%	37.2%
Total		353	100.0%	257.7%

As it can be observed from table 4.18, most respondents best chosen input used for quantitative risk analysis includes identified risks and list, risk management plan and list of prioritized risks accounting 24.9%, 22.1% and 21% of the response respectively. Moreover, respondents also select expert judgment and historical information as an input for quantitative risk analysis covering 17.6% and 14.4% of the response respectively.

4.4.3.2.2 Tools and Techniques

Respondents were asked to forward their opinion on tools and techniques used for quantitative risk analysis based on the guide from project management body of knowledge. Four tools and techniques were depicted and their responses are summarized on the following table

Table 4.19 Tools and Techniques used for Quantitative Risk Analysis

		Responses		Percent of Cases
		N	Percent	
Tools and techniques used for quantitative risk analysis	Interviewing	89	34.5%	65.0%
	Decision tree analysis	52	20.2%	38.0%
	Sensitivity analysis	92	35.7%	67.2%
	Simulation	25	9.7%	18.2%
Total		258	100.0%	188.3%

As it can be observed from the above table, most respondents best chosen tools and techniques used for quantitative risk analysis includes sensitivity analysis and interviewing, accounting 35.7% and 34.5% of the response respectively. Moreover, respondents also select decision tree analysis and simulation as tools and techniques for quantitative risk analysis accounting 20.2% and 9.7% of the response respectively.

4.4.4 Project Risk Response

4.4.4.1 Inputs

Respondents were asked to forward their opinion on the input used for project risk response based on the guide from project management body of knowledge. Seven inputs were depicted and their responses are summarized on the following table.

As it can be observed from the table below, most respondents best chosen input used for project risk response includes risk management plan, list of prioritized risks and risk ranking of the project accounting 20.6%, 19.1% and 16.6% of the response respectively. Moreover, respondents also select, trends in qualitative and quantitative risk analysis trends, risk thresholds, list of potential responses and probabilistic analysis of the project as an input for risk response covering 11.6%, 11.1%, 11.1% and 10.1% of the response respectively.

Table 4.20 Inputs used for Project Risk Response

		Responses		Percent of Cases
		N	Percent	
Inputs used for project risk response	Risk management plan	82	20.6%	59.9%
	Risk thresholds	44	11.1%	32.1%
	Probabilistic analysis of the project	40	10.1%	29.2%
	Trends in qualitative and quantitative risk analysis trends	46	11.6%	33.6%
	List of prioritized risks	76	19.1%	55.5%
	Risk ranking of the project	66	16.6%	48.2%
	List of potential responses	44	11.1%	32.1%
Total		398	100.0%	290.5%

4.4.4.2 Tools and Techniques

Respondents were asked to forward their opinion on tools and techniques used for project risk response based on the guide from project management body of knowledge. Four tools and techniques were depicted and their responses are summarized on the following table.

Table 4.21 Tools and Techniques used for Project Risk Response

		Responses		Percent of Cases
		N	Percent	
Tools and techniques used for project risk response	Avoid	64	17.4%	46.7%
	Transfer	117	31.9%	85.4%
	Mitigate	123	33.5%	89.8%
	Accept	63	17.2%	46.0%
Total		367	100.0%	267.9%

From the response of the respondents in table 4.21, it is easy to understand that all the tools and techniques of risk response employed by Agricultural projects. However, due to the nature and significance of those responsive measures to minimize the severity and consequence of the expected risk the degree of practice differ from one project to another. As a result, among these tools and techniques of risk response measures, the main responsive measures taken by the projects are inclined in to risk mitigation which accounts 33.5 % and risk transfer measures which account 65.1%. The other two responsive measures accepting the risk and risk avoidance measures was not the preferred options particularly risk avoidance option is not relevant as risks are not predictable and impossible to avoid.

4.4.5 Project Risk Monitoring and Control

4.4.5.1 Inputs

Respondents were asked to forward their opinion on the input used for project risk monitoring and control based on the guide from project management body of knowledge. Five inputs were depicted and their responses are summarized on the following table.

Table 4.22 Input used for Project Risk Monitoring and Control

		Responses		Percent of Cases
		N	Percent	
Inputs used for project monitoring and control	Risk management plan	91	28.8%	66.4%
	Project communication	77	24.4%	56.2%
	Scope change	29	9.2%	21.2%
	Risk response plan	72	22.8%	52.6%
	Additional risk identification analysis	47	14.9%	34.3%
Total		316	100.0%	230.7%

As it can be observed from the above table, most respondents best chosen input used for project risk monitoring and control includes risk management plan, project communication and risk response plan accounting 28.8%, 24.4% and 22.8% of the response respectively. Moreover,

respondents also select additional risk identification analysis and scope change as an input for risk monitoring and control covering 11.6%, 11.1%, 11.1% and 10.1% of the response respectively.

4.4.5.2 Tools and Techniques

Respondents were asked to forward their opinion on tools and techniques used for project risk monitoring and control based on the guide from project management body of knowledge. Five tools and techniques were depicted and their responses are summarized on the following table.

As it can be observed from table 4.23, most respondents best chosen tools and techniques used for project risk monitoring and control includes; Periodic project risk review, project risk response audit and technical performance measure accounting 27.2%, 26.6% and 18.9% of the response respectively. Moreover, respondents also select earned value analysis and additional risk response planning as an input for risk planning covering 14.8%, and 12.4% of the response respectively.

Table 4.23 Tools and Technique used for Project Risk Monitoring and Control

		Responses		Percent of Cases
		N	Percent	
Tools and techniques used for project risk monitoring and control	Project risk response audit	90	26.6%	65.7%
	Earned value analysis	50	14.8%	36.5%
	Additional risk response planning	42	12.4%	30.7%
	Periodic project risk review	92	27.2%	67.2%
	Technical performance measure	64	18.9%	46.7%
Total		338	100.0%	246.7%

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECCOMMENDATION

5.1 Summary of Findings

This project work attempted to assess risk management practices of agricultural projects financed by Development Bank of Ethiopia based on the five risk management processes: risk planning, risk identification, risk analysis, risk response, and risk monitoring and controlling processes.

Based on the data analyzed in chapter four, using descriptive approach for qualitative data collected through questionnaire, the researcher comes up with the following results.

- Regarding the assessment of risk management practice of agricultural projects financed by DBE, an average median score of 3.00 is achieved indicating 50% of participants forward their opinion neutral to agree whereas, the other 50% gave their opinion as neutral to disagree depicting this process as a less practice. Most of the respondent agree there is a best practice on elements such as, DBE has a policy and procedure that guide the project team to go through a disciplined project management process. On the contrary, most respondents argue there is less practice regarding the availability of document register system. Moreover, respondents believe there is a better practice on elements such as; activities for risk management were specifically identified, defined and included in the project's schedule, the project has team of experts with relevant experience in project risk management, and the project has a well-thought-out risk management plan.
- As for risk planning practice of agricultural projects financed by DBE, an average median of 3.00 is obtained indicating 50% of participants forward their opinion neutral to agree whereas, the other 50% gave their opinion as neutral to disagree depicting this process as a less practice. That also shows almost equal amount of respondents believe risk planning process as either better or less practice on agricultural projects financed by DBE. Planning meetings were hold to develop the risk management plan and risk management methodology as well as the tools and data sources that are used in the risk management process was established is observed to be better practiced elements in administering those projects. On the other hand, all main stakeholders were invited to participate and the risk management plan received their approval and support is a less practiced element while equal of respondents believe that risk plan ensures that the

degree, type, and visibility of risk management that commensurate with the project plan is as less or better practice element. Organizational risk management policies, defined roles and responsibility and work breakdown structure are the most used inputs during agricultural projects risk planning whereas, stakeholder register is the least used input in those projects. Expert judgement and analytical techniques are the most used tools and techniques in risk planning of agricultural projects financed by Development Bank of Ethiopia.

- Regarding risk identification process of those agricultural projects financed by DBE, an average median score of 3.43 indicating much of the respondents believe it is better practice process. project risks were identified based on established risk identification process for projects by experts, risks are identified throughout the project lifecycle, the project team is involved in the risk identification process are better practiced elements whereas, risk register preparation and it's usage is less practiced elements in risk identification process of agricultural projects in the Bank. In addition, risk management plan and historical information are the most used inputs while risk categories is the least used inputs for project risk identification process. On the other hand, SWOT analysis and documentation review are the most used tools and techniques while diagramming technique and brainstorming are the least used tools and technique in risk identification of those project. Risk categories such as production risk and financial risk are the most prominent risk types faced by agricultural projects in the Bank. However it doesn't mean other risk type doesn't exist rather it only indicate other risk type were not as such frequent as expected.
- As for risk analysis both qualitative and quantitative risk analysis are evaluated. Regarding qualitative risk analysis process, average median score of 3.00 is achieved indicating; it is less practice across agricultural projects financed by DBE. Furthermore, element like; project has been gone through established qualitative risk assessment is better practiced element whereas, assumptions made for during the analysis of identified risks was clearly stated, assessment of risk was done by factual information and data and project documents were updated after risks were analyzed are less practiced elements during qualitative risk analysis. Risk probability and impact assessment, and expert judgement are widely used tools and techniques while data precision testing (like quality, reliability and integrity of data) is the least used tools for qualitative risk analysis of those agricultural projects. With respect to quantitative analysis, average median score of 3.00 is obtained indicating this process is less

practiced across financed agricultural projects in the Bank. In addition, identified risks were numerically analyzed to show the effect on overall objectives of the project, risk are clearly identified and enabled to identify realistic and achievable project cost, schedule, scope and targets and project document has been updated after risks were analyzed quantitatively are less practiced element in this process. Inputs such as identified risk and list, and risk management plan are the most used input for quantitative risk analysis of those projects. Sensitivity analysis and interviewing are prominently used tools and technique while simulation represent the least used tool and techniques when qualitatively analyzing the identified risk of those projects financed by DBE.

- On the subject of risk response process, average median score of 3.29 is achieved which indicate this process is better practiced. Options and actions are developed to enhance opportunities and to reduce threats to project objectives and risks are addressed by their priority are best practiced elements whereas, use of decision tree analysis method is less practiced element when evaluating risk response practice of agricultural projects financed by Development Bank of Ethiopia. Risk management plan and list of prioritized risk are prominently used input whereas, probabilistic analysis of projects and risk thresholds stands for the least practiced input used for risk response process. Risk response are used to minimize the severity of risk in different agricultural projects. Risk mitigation and risk transfer are the most used tools and techniques for those agricultural projects financed by DBE.
- Regarding risk monitoring and control process, the average median score achieved is 3.25 indicating the status of best practiced process. Risks that occur within the project are controlled in a way that goes with the goal and objective of the project, new risks are identified and residual risks are monitored and risk monitoring and control is treated as a continuous process in the project are best practiced elements. On the contrary, project management plan, project documents and organizational process assets are updated after monitoring and control process is less practiced elements when monitoring and controlling agricultural projects financed by DBE. Risk management plan and project communication are the most used inputs whereas, scope change is the least used input when monitoring and controlling those projects. In addition, periodic project risk review and project risk response audit are widely used tools and technique, whereas, additional risk response planning is the least used tools and techniques during risk monitoring and control process.

5.2 Conclusion

This project work has been conducted to assess risk management practices of agricultural projects financed by Development Bank of Ethiopia. Based on the findings discussed in this chapter, the following conclusions are drawn.

Agriculture is a unique sector because of it's dependence on climate and biological variables. Funding opportunities for agricultural projects have an important role in the sustainable development of this field, but in terms of broad range of possible risk and from the point of view of credit applicant (Beleiu & Tonea, 2018). Therefore, it is vital to assess risk management practice of agricultural projects that involve risk planning, risk identification, risk analysis, risk response and risk monitoring and control.

According to the findings of the study, despite the fact that, there is a distinct procedure set to follow in the risk management process, not all risk management process groups seem to be adequately and fairly exercised in agricultural projects financed by DBE. Awoke (2020) argued having distinct process set to follow in risk management process don't insure to have proper risk management practice. he also find out in his work that each risk management process are not properly and equally practiced. With respect to risk planning process, planning meeting across the bank staff is held to develop risk management plan but it lacks to involve stakeholder/customer during project appraisal process. It is obvious that risk management plan is vital to communicate with and obtain agreement and support from all stakeholders to ensure risk management process is supported and performed effectively over the project lifecycle. Project risk management methodology of agricultural projects was not established, as well as the tools and data sources that are used in the risk management. Generally, the absence proper risk planning process is acknowledged and it's practice on DBE financed agricultural projects is found to be unattractive. Organizational risk management policies and expert judgement are prominently utilized input, and tools and technique during risk planning of agricultural projects respectively.

Accordingly, the practice of risk identification process of agricultural projects is better practice than other process. According to Jankelova et al. (2017), risk identification and risk definition is the first and the most important phase of the risk management. In spite of, the limitation that all stakeholder are not involved in risk identification process, risk are identified throughout the project cycle by established process based on scope statement, milestone and deliverables of those projects. Inputs like; risk management plan and historical information of other similar

projects are widely used in this process. Even though, Skitmore & Lyons (2004) found out brainstorming to be the most commonly used techniques in risk identification, this study indicate SWOT analysis and documentation review as highly used tools and techniques in identifying the risk involved in agricultural projects in the Bank. Production risk associated with weather, climate changes, pests, diseases, machinery efficiency, and the quality of inputs and financial risk are the most prominent risk type noticed. However, Pelka (2015) argued that nature of risk has changed over time. The challenges to the agricultural sector from a growing world population, from changing diets with higher demand for animal-source foods, and from climate change, make managing multiple risks more important than ever.

Both qualitative and quantitative risk analysis of the identified risk are conducted and are found to be less practiced across the project under study. Agricultural projects have limited experience using these processes to analysis risk in order to determine the impact and likelihood of defined risks, as well as numerically analyze the probability of each risk and its impact on project goals, as well as the scope of overall project risks. Identified risk and project status are widely utilized input whereas; tools and techniques such as; expert judgement, and risk probability and impact assessment are mostly used in conducting qualitative analysis of risk identified in agricultural projects. Moreover, identified risk and list, and risk management plan as an input and interviewing and sensitivity analysis as tools and technique are used for quantitatively analyzing identified risks in agricultural projects.

Risk response for agricultural projects financed by the Bank is found out to be a better practiced process in which risk are addressed by their priority and options and actions are developed to enhance opportunities and to reduce threats to project objectives. However, strategies to mitigate identified risk, allocation of contingency reserve for cost and time and assignment of individuals for identified risk are less practiced elements in this process. Risk management plan and list of identified risk are inputs used in this process. Risk mitigation like collateral or equity contribution and risk transfer like insurance, performance bonds, warranties and guarantees are widely used tools and technique when responding the risk in such projects. In their study of risk factors in the agricultural sectors, Naderza, et al., (2017) also stated that insurance is widely implemented risk response method in smaller company. However, Awoke (2020) argued risk mitigation is the most frequently used risk response method followed by risk transfer; risk elimination and risk retention - with the use of contingencies and contractual transfer preferred over insurance.

Regarding the last risk management process, i.e. risk monitoring and controlling, those agricultural projects financed by DBE experiences better practice like that of risk response in which this process is treated as a continuous process, risk are controlled in line with the goal of the project. Moreover, effectiveness is also monitored throughout the project lifecycle while new risks are also identified in the process. Risk management plan and project communication are prominently utilized input whereas, periodic project risk review and project risk response audit are the most used tools and technique during risk monitoring and control of agricultural projects.

Risk identification, risk response and risk monitoring and control are found to better practiced risk management process than risk planning and risk analysis (qualitative and quantitative analysis. Generally, when the overall effectiveness of the project risk management activity of agricultural projects financed by the Development Bank of Ethiopia is considered, it is evident that much more work needs to be done to improve the project's risk management practice in order to reduce threat and increase opportunities.

5.3 Recommendation

Risk management process is an important aspect of projects, if properly established and implemented, it will have a positive effect on our management of time, cost and quality. Moreover, it will help the project to achieve it’s goal and objectives. Bearing that in mind, the following recommendations are forwarded.

- The risk and compliance directorate shall be empowered to participate and manage risk management practice of projects in the Bank.
- Development Bank of Ethiopia shall aim to fill the knowledge and skill gaps of its employees and stakeholders, especially in relation to risk management, by providing structured and on-the-job training.
- Even though, the bank has policy and procedure to guide the project team to go through disciplined risk management process, it highly focus on financial risk. Therefore higher attention shall be given to incorporate other type of risks such as; production, human, legal and market risks in agricultural projects.
- Risk planning should be given sufficient attention because an effective planning process can facilitate decision-making related to risk assessment, review, response mechanisms, and risk monitoring and control, and reporting during the project. Moreover, financed agricultural projects must create a risk management culture by implementing a well-

formulated risk management plan in which all collaborators and stakeholders must actively engage and understand the importance of the best possible implementation of project risk management processes.

- Risk identification, shall be conducted with extreme caution to ensure that it is thorough and that all stakeholders are involved. The risk registry, that is the product of the risk identification process and contains extremely comprehensive information about the risks found, shall be well documented and updated throughout the project life cycle.
- Development Bank of Ethiopia shall enhance both qualitative and quantitative risk analysis techniques that involved the use of advanced statistical methods to determine, with a certain degree of confidence, whether the project will meet its cost or schedule targets given the combined effect of the identified project risks. Accordingly, training shall be given to the stakeholder involved in the projects.
- Contingency reserve for cost and time shall be included while risk response practice is planned.
- Lesson learned documents shall be incorporated in the project risk monitoring and controlling process and periodic meeting shall be held throughout the project life cycle.
- This project's work is solely focused on agricultural projects. As a result, I suggest that future research be performed on other project sectors financed by Development Bank of Ethiopia, such as tourism, mining, and quarries, among others.

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APPENDIX A

Addis Ababa University

College of Business and Economics

School of Commerce

Questionnaire for the Study;

I am Tarik Alemayehu, MA student in the Department of Project Management, Addis Ababa University, College of Business and Economics. I am currently conducting a study on assessment of project Risk Management practice of Agricultural Projects Financed by Development Bank of Ethiopia.

I appreciate your kindness to participate in this survey, and I kindly ask you to fill out all the questions responsibly. Please be assured that all responses will remain confidential and will be used **only** for academic purpose.

If you have any further question, explanation or clarification, you can contact me through my email address tarikalex22@gmail.com or phone number +251911756330.

General instructions;

- The questionnaire contains two sections
- Section one is about demographic information of the respondent
- Section two contains questions about project risk management process and practices
- It is not desirable to write your name.
- Read carefully and give appropriate answers by ticking (√) or filling the blank spaces or boxes.

Section One: Demographic Information

1. Project Name: .....

2. Indicate your Age group

   Below 30 ☐ 30 - 45 ☐ Above 45 ☐

3. Indicate your Gender:

   Male ☐ Female ☐

4. Indicate your Educational level

   Diploma: ☐ Degree: ☐ Masters: ☐

   If others please state.....

5. Indicate your current position in the project

   Managerial ☐ Professional ☐

6. Working Experience related to Project Risk Management

   Below 2 years ☐ 3-5 years ☐

   6-10 years ☐ More than 10 year ☐

Section Two: Project Risk Management Process and Practices

i. General Project Risk Management Process

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
7	The project has a well-thought-out risk management plan					
8	The required resources and costs for the project risk management processes were estimated and included in the project budget					
9	Activities for risk management were specifically identified, defined and included in the project's schedule					
10	There is documented risk register system					

11	The project has team of experts with relevant experience in project risk management					
12	There is a policy and procedure that guide the project team to go through a disciplined risk management process					

ii. Risk Planning

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
13	Planning meetings were hold to develop the risk management plan					
14	All main stakeholders were invited to participate, and the risk management plan received their approval and support.					
15	The risk plan ensures that the degree, type, and visibility of risk management that commensurate with the project plan					
16	The risk management methodology was established, as well as the tools and data sources that are used in the risk management process.					

17. Which input is used in risk management planning for the project? (Select more than one inputs if it is applied or plan to use)

Defined roles and responsibilities ☐ Organization's risk management policies ☐

Stakeholder register ☐ Work breakdown structure ☐

Stakeholder risk tolerances ☐ Project charter ☐

Template for the organization's Risk management plan ☐

18. What tool and technique is used in risk planning for the project? (Select more than one tool if you have applied or plan to use)

Analytical technique ☐ Expert judgment ☐ Planning Meeting ☐

iii. Risk Identification

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
19	The project risks were identified based on established risk identification process for projects by experts					
20	Risks are identified throughout the project lifecycle					
21	The project team is involved in the risk identification process					
22	All key project participants involved in risk identification					
23	A clear description of the risks within the cause and effects are understood and documented					
24	Scope statement, milestones, WBS and deliverables of the project are used to identify risks					
25	Risk register is prepared and used for risk identification process in the project					

26. Which Risk category is that your project mostly encountered in the Agricultural project?

Production risk ☐ Marketing risk ☐ Financial risk ☐

Legal risk ☐ Human risk ☐

27. Which input was used in risk identification for the project? (Select more than one input if you have applied or plan to use)

Risk management plan ☐ Historical Information ☐

Product description ☐ Project planning outputs ☐

Enterprise environmental factors ☐ Risk categories ☐

28. What tool and technique was used in risk identifications? (Select more than one tool if you have applied or plan to use)

Documentation reviews ☐ Checklist analysis ☐

SWOT analysis ☐ Diagramming analysis ☐

Information gathering techniques ☐ Assumptions analysis ☐

Brainstorming ☐

iv. Risk Analysis

a) Qualitative Risk Analysis

Qualitative risk analysis is the process of assessing the likelihood and impact of identified risks.

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
29	The project has been gone through established qualitative risk assessment					
30	The project had risk matrix that defines probability of list of risks identified and their impact					
31	Assumptions made for during the analysis of identified risks was clearly stated					
32	The assessment of risk was done by factual information and data					
33	Project documents were updated after risks were analyzed qualitatively					

34. Which input has been used for the project qualitative risk analysis? (Select more than one input if you have applied or plan to use)

Risk management plan ☐ Identified risks ☐

Project status ☐ Risk register ☐

Project type ☐ Data precision ☐

Scales of probability and impact assumptions ☐

35. What tool and technique was used in qualitative risk analysis for the project? (Select more than one tool if you have applied or plan to use)

Risk probability and impact assessment ☐ Probability/impact risk rating matrix ☐

Project assumptions testing ☐ Expert judgment ☐

Data precision testing (like Quality, reliability and integrity of data) ☐

b) Quantitative Risk Analysis

The quantitative risk analysis process aims to analyze numerically the probability of each risk and its consequence on project objectives, as well as the extent of overall project risk.

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
36	The project risk has been quantified with standard process					
37	Identified risks were numerically analyzed to show their effect of on overall objectives of the project					
38	Projects risk are clearly identified and enabled to identify realistic and achievable project cost, schedule, scope and targets					
39	The project document has been updated after risks were analyzed quantitatively					

40. Which input has been mostly used in the quantitative risk analysis in the project? (Select more than one input if you have applied or plan to use)

Risk management plan ☐ Identified risks and list ☐

List of prioritized risks ☐ Historical information ☐

Expert judgment ☐

41. What tool and technique has been used for the project quantitative risk analysis in the project? (Select more than one tool if you have applied or plan to use)

Interviewing ☐ Sensitivity analysis ☐

Decision tree analysis ☐ Simulation ☐

v. Risk Response

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
42	The project has planned responses as opposed to considering risks as they arise.					
43	The project has developed strategies in order to prevent or mitigate all the identified risks					
44	Assigning of one or more persons for each agreed to risk response is in place					
45	A decision tree analysis method is in place to choose the most appropriate response					
46	Options and actions are developed to enhance opportunities and to reduce threats to project objectives					
47	Risks are addressed by their priority					
48	An allocation of contingency reserve for cost and time considered					

49. Of the types of input, which input has been mostly is used in risk response in the project? (Select more than one tool if you have applied or plan to use)

Risk management plan ☐ List of prioritized risks ☐

Risk thresholds ☐ Risk ranking of the project ☐

Probabilistic analysis of the project ☐ List of potential responses ☐

Trends in qualitative and quantitative risk analysis trends ☐

50. What tool and technique/or options is used in risk response for the project? (Select more than one tool that you have applied or plan to use)

Avoid ☐ Mitigate ☐

Transfer ☐ Accept ☐

vi. Risk Monitoring and Control

No	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
51	Risks that occur within the project are controlled in a way that goes with the goal and objective of the project					
52	Identified risks are tracked and reassessed					
53	New risks are identified and Residual risks are monitored					
54	Project team hold periodic meetings specifically for risk discussions					
55	Effectiveness of risk management process is evaluated throughout the project					
56	Risk monitoring and control is treated as a continuous process in the project					
57	Project management plan, project documents and organizational process assets are updated after monitoring and control process					
58	Project team performs reserve analysis					

59. Of the types of input which input has been mostly is used in risk response in the project? (Select more than one input that you have applied or plan to use)

Risk management plan ☐ Risk Response Plan ☐

Project communication ☐ Additional Risk Identification analysis ☐

Scope change ☐

60. What tool and technique is used in risk monitoring and control in the project? (Select more than one input that you have applied or plan to use)

Project risk response audit ☐ Periodic project risk review ☐

Earned value analysis ☐ Technical performance measure ☐

Additional risk response planning ☐