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**Risk Management in Smallholder Scheme Projects in Ghana. Case Study Of Norpalm
Ghana Limited's Smallholder Scheme Project**

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the requirements for the award degree of**

MASTER OF SCIENCE

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published by another person nor material which to as substantial extent has been accepted for the award of any other degree or diploma of the University Kumasi or any other educational institution, except where due acknowledgment is made in the thesis.

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ABSTRACT

The agricultural sector plays a vital role in the economy of Ghana however, it is embedded with lots of risks that can affect the success of a project if not managed properly. This thesis is a study of risk management in a smallholder scheme project in Ghana using Norpalm Ghana Limited an oil palm plantation company as a case study. The main aim of the study was to identify the risks associated with Norpalm Ghana Limited's smallholder scheme project and their response strategies. The objectives were to explore the risk associated with Norpalm Ghana Limited's smallholder scheme project and assess its impact on the project. Questionnaires were developed and used to fulfil the objectives of the study. The questionnaires were distributed to all participants in Norpalm Ghana Limited's smallholder scheme project. They included management, scheme manager, project team members and the project leads. Data collected were analyzed using descriptive statistic and results were ranked using their means scores. Respondents in the study concluded that ten most important risks that can affect a smallholder scheme project include: land availability, stakeholder selection process and engagement, weather condition, pest and disease management, team members with negative attitude towards project, financial difficulties, health and safety, communication methods, soil fertility and lack of training. The study revealed that all the participants acknowledged the need to perform risk identification and analysis in a project but some of them have never performed risk identification analysis before. The study recommended that project managers and stakeholders should train their project team in risk management process, organization should engage team member and select project lead with background in risk management.

Keywords: Risk management, risk identification, smallholder scheme project

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LIST OF ABBREVIATION

CPO: Crude Palm Oil

F.A.O: Food and Agriculture Organization

GDP: Gross Domestic Product

GOPDC: Ghana Oil Palm Development Company.

IFAD: International Fund for Agricultural Development

IFC: International Finance Corporation

NES: Nucleus Estate Smallholder

PMI: Project Management Institute

PMI: Project Management Body of Knowledge

RSPO: Roundtable on sustainable Palm Oil

SPSS: Statistical Package for Social Sciences

DEDICATION

To the Almighty God who gave me the strength, wisdom, knowledge and understanding to go through this Master of Science degree programme successfully.

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It is not by my might that I have gotten this far, and I therefore want to give thanks to the Almighty God for giving me the grace and strength to complete my Master of Science Degree programme. Without whom it would not have been possible.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Agriculture plays a vital role in promoting growth and reducing poverty in Ghana. In Ghana, land is an important resource for agricultural production, and the contribution of the agricultural sector to GDP is significant, standing at about 20 per cent (Iddrisu *et al.*, 2017). The agriculture sector of Ghana is practically responsible for attaining the country's first millennium development goal of reducing the percentage of the population experiencing hunger. The various farming systems and extension services acknowledges the crucial role farmers play in the success or failure of an agriculture project. The agriculture sector of Ghana employs over half of its labour force and plays a pivotal role in the nation's economy (Oxford Business Group, 2018).

According to the World Bank (2007), agricultural investment is one of the most effective strategies for economic growth and poverty reduction in rural areas of developing countries where most of the world peasant farmers live. This has led to the use of various strategies like scheme project and farmer groups to help meet the demand for food security.

Smallholders scheme are smallholders who are structurally bound by contract, by credit agreement or by planning to a particular firm (Roundtable on Sustainable Palm Oil, 2018). Smallholder scheme may be obliged or bound to sell their produce or product to the firm that they are in contract with. Furthermore, scheme smallholders are often not free to choose which crop they developed, and their operation and management technique may be supervised (Roundtable on Sustainable Palm Oil, 2018).

However, for successful implementation of scheme project like the smallholder scheme project require the application of knowledge in project management. Maylor *et al.*, (2006) states that one of the significant areas in organizational development in record time has been the growth of project across different industries. The adoption of project management standards is no longer a discipline for the construction and engineering sectors only. It is used as a model by both private and public industries for business change, improvement and development (Amponsah, 2010) of which agriculture is inclusive. Agriculture projects like any other projects in other discipline goes through the same project management phases thus initiating, planning, executing, monitoring, controlling, and finally closing. According to Verschoor *et al.*, (2005) the project cycle is still a major part of development strategy and most projects funded by the World Bank and the Food Agriculture Organization (F.A.O) are planned and evaluated according to its project management principles. Engaging key stakeholders and participating farmers during the initiation of projects helps address any constraint during its design and implementation. Their participation in the project enables the farmer to communicate requirement, empower cohesive farmer groups and eliminate over emphasis of technical aspect (Verschoor *et al.*, 2005). Agricultural projects initiated without the involvement of stakeholders at initial stage can result in failure, as there is the likelihood of not meeting the concern of the targeted group.

Studies by Amponsah, (2010) stated that the rate of project failure in Ghana including agricultural projects are very high and the cost and risk involve are extremely high failure of projects in Ghana with agricultural projects inclusive have been attributed to number of reasons of which risk is one of them (Akroyd, 1999; AfDB, 2006).

The definition of risk is relative to associations and people. According to Ale, (2002) “risk is the combination of probability and the extent of consequence”. The International Organization for

Standardization, (2009) also defines risk as “the effect of uncertainty on objectives”. It can be said that almost all the process and phases in a project is subject to risk (PMI, 2017). The management of risk is a process with the goal of identifying and developing basis of risk and uncertainty control on impact and proposing suitable solution (Uher, 2003).

Being able to understand risk management process and procedure in the agriculture sector is important because it help identify the possible obstacle in the implementation of risk management in Ghana. This knowledge in managing risk in project can further help developers and stakeholders to recognize risk factors and their impact in agricultural projects.

Risk is inherent to agriculture and the common amongst them include pest, disease, natural disaster and political institution. Risks ought to be identified early so that proactive measures may be taken to avoid them or managed when they occur.

1.2 Problem statement

It is possible to empower smallholder farmers to take advantage of market opportunities for high value agriculture. About 70% of Sub-Sahara Africa live in rural areas depend on agriculture for their livelihood (Mwambi *et al.*, 2016). Poor performance of the agricultural sector in most developing countries can be attributed to the use of informalities, traditional, elementary and archaic technologies and methods for their farming activities. This has resulted in international organization or agencies deciding to assist developing countries especially Africa to invest in agriculture through a number of projects.

Instituting a smallholder scheme project is one of the strategies for improving farming access to market both locally and internationally. However, projects of such nature in Ghana not has always been successful. (Global Poverty Reduction Strategy; 2005; Amponsah, 2010) states that in

developing nations like Ghana, agriculture institutions rely on projects to meet their objectives and the lack of project management knowledge and skill is a severe hindrance in the development of an effective risk management in agriculture.

Most agriculture projects in Ghana are lost in on what it entails to identify, analyze and manage risk in a project, since the sector can be highly difficult and fraught with uncertainties, insecurities and other challenges. Participants in some agriculture in agriculture project in the Ghana have limited knowledge or even no information on the essence of risk identification and analysis management.

Smallholders' farmers' livelihood is especially susceptible. They sometimes have difficulty in assessing and managing risk and fail to benefit from good investment opportunities that could improve their farming business and possibly strengthen household resilience. The risks associated with agriculture are many and diverse (Managing risk in agriculture: a holistic approach, 2009; IFAD, 2018). Few studies have been carried out to explore procedures adopted in the identification, analysis and management of risk in Ghana's agriculture project.

In line with this, the study seeks to explore the risks pertaining to the smallholder scheme project in Ghana using Norpalm Ghana Limited's smallholder scheme project as a case study.

1.3 Aim

The aim of the study is to identify risks associated with Norpalm Ghana Limited's (NGL) smallholder scheme project and their response strategy.

1.4 Objectives

1. To identify the risks of Norpalm Ghana Limited's smallholder scheme project.
2. To assess the impact of the identified risk Norpalm Ghana Limited's smallholder scheme project.

1.5 Research question

This study answers the following questions:

1. What are the risks associated with Norpalm Ghana Limited's smallholder scheme project?
2. What is the impact of each identified risk on Norpalm Ghana Limited's smallholder scheme project?

1.6 Methodology

A census was used to gather the required information for the study. Questionnaires were developed and used to fulfil the objectives of the study. The questionnaires were distributed to all participants in Norpalm Ghana Limited's smallholder scheme project. They included management, scheme manager, project team members and the project leads. Data collected were analyzed using descriptive statistic and results were ranked using their means scores. A review of appropriate literature was used as a guide to support the study.

1.7 Scope of study/delimitation

The scope of the study was limited to Norpalm Ghana Limited's smallholder scheme project in the Ahanta West District. Norpalm Ghana Limited was chosen for the study because it is one of the few oil palm plantations in the country implementing smallholder scheme project. It was also chosen because of the researcher's familiarity with the company.

1.8 Significance of study

Agricultural project including smallholder scheme project suffer a lot in terms of early risk identification assessment and effective management control. Even though studies have been carried out on risk in project management in Ghana, most of them have focused their research on construction and engineering sector with only a few publications on the agriculture sector. The findings of this research will help contribute to the knowledge of project risk management in the agriculture sector of Ghana. The study will highlight risks and their impact associated with smallholder scheme project in Ghana so that similar scheme project being planned in the future can identify the risks and managed effectively. The research will outline the best applicable risk management tool(s) and technique(s) that can be used for effective management of a smallholder scheme project and also developing an appropriate framework for the management of risk in Ghana. This study will help avoid certain types of risks by informing smallholder scheme developers of possible risks at project formulation stage, serve as a guide at the planning and implementation of a smallholder scheme project.

1.9 Structure of study

The study is in five chapters. The first chapter outlines the background of the research, problem statement, objectives of the research, research questions, delimitation and methodology. Chapter two deals with literature review from related studies. This is followed by chapter three which talks about methodology to help meet the objectives while chapter four will deal with analysis of data and discussion of the study. The last chapter which is five will deal with summary, conclusion and recommendation.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant published literature on the concept of risk management in an agriculture project. The concept of smallholder scheme and its application in the oil palm industry is reviewed. Key topics in risk management include risk identification, risk assessment in a project, risk analysis and risk response by stakeholders in the industry. Information reviewed in this chapter will be deliberated on in chapter four to assist in the discussion and analysis of results.

2.2 Risk defined

Risk is present in all areas of life and its management is very critical. Review of literature reveals that there is no agreed definition of risk. Some definitions of risks are based on probability, chance or expected value, undesirable events and other uncertainties. Some view risk as subjective, reliant on available information to them, whereas others grant risk an ontological status independent of the assessors (Aven, 2012).

Over the past decade, the concept of risk has been a subject of intensive conceptual and empirical research in the field of academia. The classical conception views risk as the chance of injury, damage or loss. This distinguishes between risks, which can be defined as probability that a particular adverse event is capable of occurring during a stated period of time or a result from a particular challenge. The resulting probability and its consequence of adverse event are assumed to have been produced by a physical and natural process and it can be quantified (Vatsa, 2004).

Dorfman and Carther, (2013) define risk as the chance of loss or an unfavourable outcome associated with an action while Jaafari's, (2001) definition of risk considered the magnitude of the risk. According to Jaafari, (2001) risk is the probability of occurrence of loss or gain multiplied by their corresponding magnitude. An event is certain when its probability of occurring is hundred percent and uncertain when the probability of occurrence is zero percent. However, a low degree of uncertainty does not automatically mean a lower risk and a high uncertainty does not mean a high level of risk (Aven and Renn 2009). A simplistic definition by Cervone, (2006) states that risk is a problem that is yet to happen. While it may sound simple it gets to the core question being asked by the project manager thus what are the problems that one might face on a project.

The project management institute and the association for project management both have similar definitions of risk. The project management institute (2017), defines risk as an uncertain event or condition that, if it occurs, has a positive or negative effect on a project's objectives while the association for project management (2018), defines risk as an uncertain event or set of circumstances that, should it occur, will have an effect on the achievement of the project objectives. Both definitions emphasize on the ability a risk has in affecting project objectives like quality, schedule, scope and cost.

Recognizing the various definitions, and for the purpose of this research we will be using the definition by the project management institute (2017).

Risk is not always certain; the likelihood of it occurring can only be estimated. There can be one or more causes of risk and if they do occur, have one or more impacts (Reichanadter *et al.*, n.d). Holton, (2004) reveals two major ingredients that need to be present for risk to exist. The first ingredient is uncertainty about the possible outcome of an experiment and the second is that the outcome has to matter in terms of its utility. An important remark worth noting is that risk is a

derived category and cannot be addressed directly without previously investigating the objectives, framework, hazard, susceptibility, resilience and the interested parties (Šotić and Rajić, 2015). Risks can affect the attainment of a project's objective either positively or negatively. Risk has dual characteristics in that it can be viewed from the positive perspective and the negative perspective. From each of these characteristics a different approach is required for their management.

2.3 Risk management

According to the association of project management (2018), risk management is a process that allows individual risk events and total risk to be understood and managed proactively, enhancing success by reducing threat and exploiting opportunities. It is not a onetime activity but continuous throughout the life cycle of a project being undertaken. Risk management always take into account the concept of uncertainty, which includes element risk and opportunity (Gravey, 2008). Managing risk is one of the key knowledge areas in project management that provides the necessary tools for the management of uncertainties in a project.

The objective of the risk management process is to efficiently balance between realizing opportunities for gains and reducing vulnerability and damages. It is an unendingly recurring process consisting of stages which, when properly implemented, facilitates continuous improvement in decision-making and performance improvement (European Union Agency Network Information Security, 2006). The risk management processes aim is not to eliminate all risk in entirety but identify the best strategies to help project stakeholder manage them (Zou *et al.*, 2007).

PMI, (2017) outlines the process of managing risk as planning, identification, analysis, response planning, response implementation and monitoring risk. Most of these processes are updated during the life cycle of the project, as new risk are identified. During the process of risk management, any positive impact identified is exploited for the benefit of the project. Risk management at its core focuses on preventing loss. Every organization regardless of its size is exposed to the potential of losing its resource (Barger, 2014). Schieg, (2006) reveals that introducing project risk management at the beginning of a project can lead to an increased cost of the project; this is compensated through the benefit of risk management. The application of risk management tools in a project increases its transparency and avoids many problems from the onset through a proactive action. Through this, any resulting consequence can be mitigated enabling the project manager to gain control over the project.

2.3.1 Risk management Planning

Planning risk management is the process of defining how risk management activities will be conducted in a project (PMI, 2017). It is always important to plan how risk in a project will be approached before acting on it. Engaging all stakeholders and experts during the planning stage is very critical for the success of a project. It allows stakeholders to contribute to the risk planning process. Risk management planning provides the understanding of possible risks that threatens a project and how to effectively plan for their response (Buertey *et al.*, 2012). Creating a risk management plan is one of the proactive ways that help to determine and profile a risk, instituting accepted risk threshold, how it is reported and managed and persons responsible for the management of risk. Risk management planning cannot be underestimated as a failure to do so can dire consequence on project objectives like schedule, cost, quality and scope. Studies by Cooke-Davies, (2000) states that based on empirical evidence, risk management planning has a positive

effect in predicting the duration of a project. Risk management planning is most often performed once at the start of the project.

Research by Zwikael and Ahn, (2011) reveals that risk management planning is not always a guarantee for project success as it also depends upon the level of risk associated with the project. Baker *et al.*, (2010) also emphasizes that at least a moderate level of risk management planning suffices to reduce the negative impact of risk on project success. This diverse knowledge of planning in risk management suggest its importance in a project. The project management institute guide (PMI, 2017) stresses on the need for proper planning on how risk will be effectively managed in project before its commencement.

Concerning the effectiveness of risk management planning, Zwikael and Ahn, (2011) reveal that risk management planning is most effective when the level of risk associated with a project is medium to high whiles in project with low risk levels, risk management planning is not effective and may be unnecessary. From their studies, it can be said that project managers who manage high-risk project preferentially invest a lot more in planning effort in order to cope with risk.

2.3.2 Risk Identification

Identifying risk has a widespread effect on the success of a project. The project management institute, (2017) defines risk identification as the process whereby individual risk associated with a project is identified as well as the source of the whole project risk and documenting their characteristics. These activities have to be orderly and wide-ranging enough to be able to capture all risks associated with the project. It is important that at this stage all identified risks be documented regardless of whether it is already a known or intrinsic in project of similar nature or magnitude. Identifying risks is the initial step in building a risk profile. It involves generating a

detailed list of risks that have either a positive or a negative impact on project objectives. A quality information and thorough knowledge about a project and its external environment are very important in identifying risks (European Network for Information Security Agency, 2006). In order to manage risk efficiently an organization must know about risks present.

Risk identification is an iterative process, since new risks comes up a project progress. Risk that has not been identified can also not be evaluated and dealt with. Since risk identification is not exact science, there is the need for a continuing process in the entire project, most importantly when starting a new phase in project and new personnel bring in various experience to the identification of risk (National Research Council, 2005). Due to environmental and internal changes, risk identification needs to be conducted continuously to reveal new risk in an ongoing project. Schieg, (2006) however contends that perfect coverage of risk is not possible. The argument is some sources of risks are obvious whilst others are identified prior to the start of the project. Including all stakeholders in the risk identification process increases the chances of successful risk list of the entire project.

There are different techniques for risk identification, such as brainstorming, check listing, interviews, using expert judgment, prompt listing and meeting but there is no best technique for risk identification, a combination of any technique may be used (Hillson 2002; PMI, 2017). The following are necessary steps for identification of risks:

1. Understanding what needs to be considered when identifying risks.
2. Information from different sources should be gathered to aid risk identification.
3. Application of appropriate tools and technique.
4. Documentation of identified risk.
5. Risk identification process documented

6. Evaluate the effectiveness of risk process.

Risks identified during the identification process is documented into a risk register. A risk document should include:

1. Thorough description of risk
2. Cause and effect of the risk on the project.
3. Internal controls present that can be used to reduce the likelihood or consequence of the identified risk on the project objectives

2.3.3 Risk Assessment

Risk assessment aims to highlight a risk picture of a project. It makes known the threat aimed at a project, the internal and external susceptibility the project will encounter and the damage that will come to the project if the threat exploits a given vulnerability (Broad, 2013).

It measures the impact of an identified risk on a project. It may be performed quantitatively or qualitatively. The risk assessment process involves finding out the consequence of an individual risk should it arise and assessing the likelihood of those consequence occurring on a project objective. The probability explores the likelihood of an identified risk occurring and the risk impact investigates the effect of the identified risk in the project. A risk matrix, which cross-references the likelihood and their impact enables risks to be effectively, evaluated using these two factors. The categorization outcome can be identified as critical risk, moderate risk, low risk and very low risk.

Risk assessment helps managers of project to focus their attention on risks that are evaluated to be high and have the potential to influence the project.

Table 2.1 Risk impact levels

Impact	Definition
Negligible	There is no noticeable effect on the project
Minor	Very small impact
Moderate	Impact is significant
Major	Serious impact, challenges with working around it
Severe	Critical impact on business reputation
Source: Reichanadter et al., 2008	

Table 2.2 Risk probability

Probability	Definition
Frequent	Occurs frequently
Likely	Occur less frequently if process is corrected
Occasional	Occurs sporadically
Seldom	Unlikely to occur
Improbable	Highly unlikely to occur
Source: Reichanadter et al., 2008.	

Table 2.3 Risk category

Low	1-3
Medium	4-10
High	11-18
Very High	19 and above
Source: (Reichanadter et al., 2008).	

2.3.3.1 Risk analysis

A successful risk assessment in a project involves conducting an analysis of risk. Risk analysis is a stage in risk assessment where the level of risk and its characteristics are evaluated and understood (European Network for Information Security Agency, 2006). The outcome from analyzing risks aids decision makers and stakeholders on whether a particular risk need to be treated or not and what is the best and most cost-effective risk treatment method.

According to Schieg, (2006) the aim is to describe comprehensively the risk situation in a project completely and precisely as possible prioritizing the various risk and their source. Cioaca, (2011) further emphases that in risk analysis it is important to define clearly all risks, including examining their relevance to the project, building project sensibility and the probability of risk realization. A lack of clarity about project objectives makes risk analysis very important. The analysis of risks in a project involves thorough examination of the risk sources, the positive and negative

consequences, probability that the consequence will occur, and which factors influence them and the controls to minimize negative impact and exploit the positive ones. Statistical tools, calculation combining impact and the probability can be used in assessing the risk level of a project. Any formula used for estimating risk level must always be consistent with the defined criteria and rating in managing risk. According to European Network for Information Security Agency, (2006) in project implementation, an event may have many consequences and could affect various project objectives, as a result the consequence and the probability need to be combined to get the level of risk. Information from history, international standards, market research and analysis, economic model and expert advice is used in estimating impacts and probabilities. Risk analysis is an iterative process; therefore, when more information becomes available during the implementation of a project it is necessary to check earlier steps, examine decisions and assumptions and make the needed revisions.

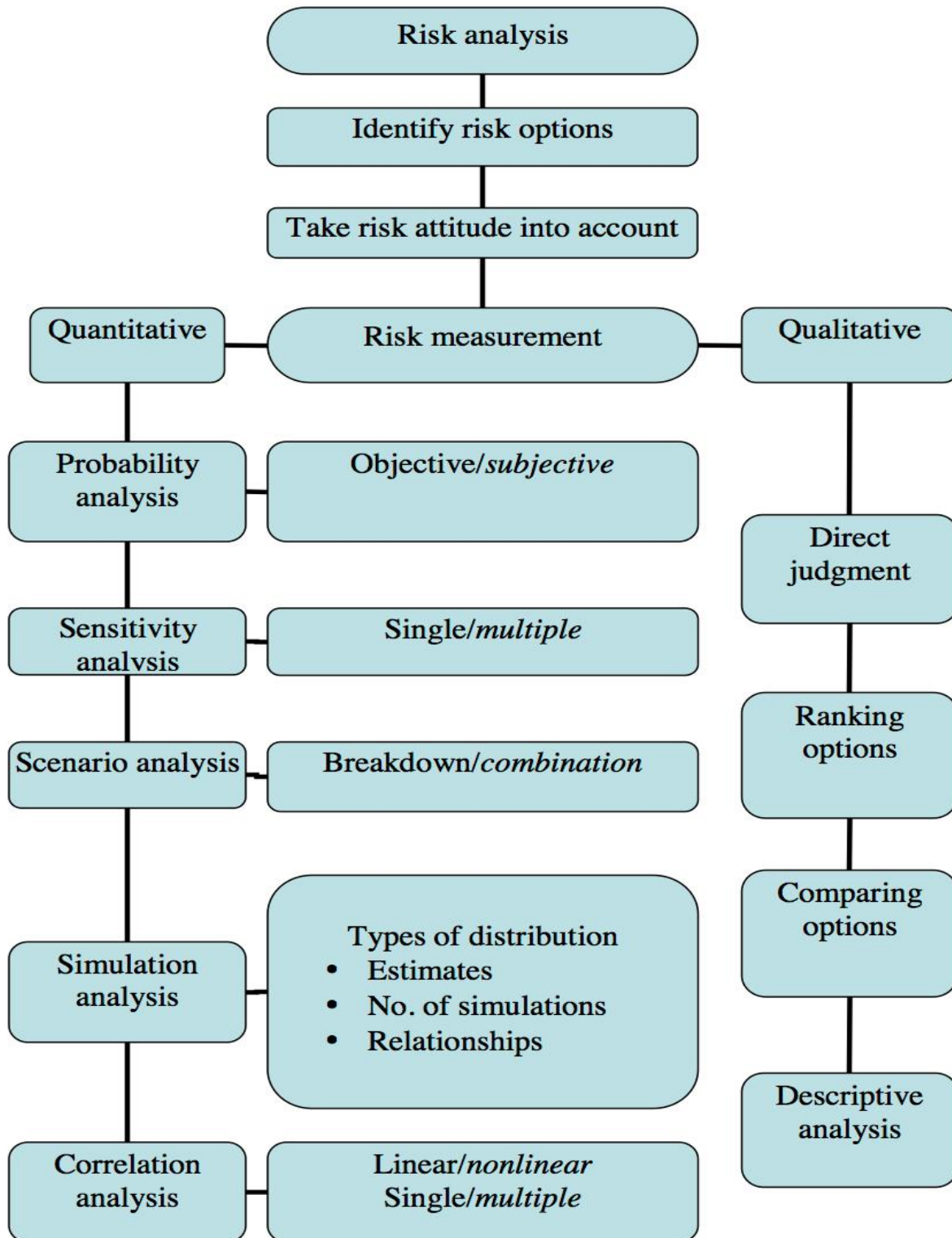


Figure 2.1 Risk analysis sequence. Source: Flanagan & Norman, 1993

2.3.3.1.1 Risk analysis methods

Depending on the purpose of analysis, detail of degree required, data and resource available, risk can be analyzed either quantitatively or qualitatively. In risk analysis, the qualitative analysis emphasizes on risk identification together with their assessment while the quantitative analysis focuses on the evaluation of risk event (Chapman, 2001).

Table 2.4 Risk analysis techniques

Risk Analysis	
Qualitative	Quantitative
Direct Judgment	Probability analysis
Ranking options	Sensitivity analysis
Comparing options	Scenario Analysis
Descriptive analysis	Simulation Analysis

Source: Ward and Chapman, 1997.

2.3.3.1.1.1 Qualitative risk analysis

Qualitative risk analysis involves methods for prioritizing project risk for further action by assessing their probability and impact (PMI, 2017). Qualitative risk analysis is a subjective analysis as it is based on the view of stakeholders and the project team, and can be perform at any point in the life of the project however, at least once prior to commencement of the project.

Qualitative risk analysis is conducted to reveal which project risks are of highest priority, those that need response, a probability impact on the project and the overall risk rating for the project (Buertey, 2012). The concept of qualitative risk analysis is of fundamental importance for the project management manager and team to take appropriate action at the beginning or prior to the

beginning of a given project to ascertain the level of risk that may exist. In performing qualitative analysis, the risks with its triggers identified and a thorough description of the risk is made. Each risk is assigned a priority rating taking in to account other existing activities. The importance of the risk is stated as a combination of its impact on the project objectives, and the likelihood of those impacts. A likelihood impact scale and matrix, which defines the importance of the combination, is used to express the effect of the risk on the project. The risk assessed is captured using narratives like high, moderate or low depending on the acceptable threshold for the project. Analyzing risk qualitatively is fast and more cost effective way of establishing priorities for planning risk response (Adedokun *et al.*, 2013). The following tools and techniques are used in qualitative risk analysis:

Brainstorming: stimulating and encouraging free flowing conversation among group of experts to identify risk in a project (Valis and Koucky, 2009).

Risk categorization: “what will we discover if we group all identified risks”? The sources of risk in a project is grouped, the affected part of the project is evaluated to determine its vulnerability to risk (Rita 2013; PMI 2017).

Root cause analysis: it is valuable for identifying and analyzing a loss to prevent its reoccurrence in the future (Valis and Koucky, 2009).

Probability and impact matrix: these are a grid showing the mapping of a probability occurrence of each risk and their impact on a stated project objectives should it occur (PMI, 2017).

Risk urgency assessment: this are risk that require urgent attention by the project management team as it could occur soon or take a longer time to plan for their response (Mulcahy, 2013).

Risk probability and impact assessment: this focuses on the likelihood that an identified risk will occur. It considers the possible effect of one or more project objectives like cost, schedule and quality (PMI, 2017).

Risk data quality assessment: it answers the question how correct and well understood is the information on an identified risk. It evaluates the preciseness of information or data about a project risk and its reliability.

According to Kindinger & Darby, (2000) qualitative risk analysis result helps the project management team in three important ways:

1. The qualitative risk analysis ranking for a project activity provides a first order prioritization of a project risk before the application of measures to control it.
2. One of the most important reason for using qualitative approach for risk analysis is that it provides the opportunity to identify risks factors of a project by evaluating all possible risk reduction action.
3. It also used in the development of input distribution for qualitative and quantitative modelling. This integration analysis is shown in figure 1.

2.3.3.1.1.2 Quantitative risk analysis

It is a numerical analysis that combines the effect of individual project risk and other sources of risk on the overall project objectives, using different simulation scenarios (PMI, 2017). According to Fallis, (2013) the objective of quantitative risk is to determine overall risk exposure, risks event that warrant response, determine quantified probability of meeting project objectives, examine the project schedule and cost reserves, identify risk that need more attention and creating cost, schedule and scope that are realistic.

Risk analysis that is scientifically sound and is backed by quantitative technique forms the basis for good risk management in a project (Hubbard, 2008). Jing *et al.*, (2012) states that in assessing in quantitative analysis large amount of data, information and material should be gathered and organized, followed by an analysis of the impact and probability, quantitative distribution of the identified risk to find the magnitude or size. The size is a value, rather than merely rating the identified risk as “high, medium and low”. The identification and assessment play an important role in the quality of result from a quantitative risk analysis. These estimates are used to evaluate the impact of the shortlisted risks on the overall project objectives. Expert estimate the impact of the risk priority in a project and assign numerical ratings to those risk (Buerthey, 2012). According Apostolakis, (2004) top- down approach of quantitative analysis provides the following benefit in risk management:

1. It provides a better understanding of the risk problem.
2. It considers different scenarios that involve many failures thus a thorough understanding of the structure failure modes.
3. Focuses on risk quantification and creates better representation of what expert may or may not know.
4. Increases the probability that complex interaction amongst events will be recognized.

However, there are some challenges in the use of quantitative risk analysis. In the use of quantitative risk analysis there could be poor management of uncertainty in risk assessment, some analyst do not consider uncertainty estimates beyond certain limits although risk analysis are to be expresses in uncertainty (Abrahamsson, 2002). Aven and Flage, (2009) also points out that communicating the results to people who are not expert in the field especially stakeholders can be

challenging as quantitative risk analysis are based more on probability and expected values. The following are techniques used in quantitative risk analysis:

Expert judgment: it uses the opinion of expert in risk management to evaluate possible risk in a project (PMI, 2017).

Decision tree analysis: it represents decision substitutes and their outcome in a chronological manner taking in to account the uncertain results (Valis and Kouky, 2009).

Sensitivity analysis: this technique analyses and compare the impact of individual project risks or other risks on project outcomes. It correlate differences in project results with variation in elements of quantitative risk analysis (PMI, 2017).

Modelling and simulation: it stimulate the effect of project risks and other sources of uncertainty to assess their impact on attaining project objectives (PMI, 2017).

Expected monetary value: it is based on the probability and impact of risk on a project with the result expressed in monetary value. The monetary value is used in ranking risks in the project (PMI, 2017).

Fault tree analysis: this technique identifies and analyzes factors that contribute to a particular undesired event (Valis and Kouky, 2009).

Fuzzy logic: it is a way of reaching conclusion based on vague, imprecise and ambiguous input (Konstandinidou *et al.*, 2006).

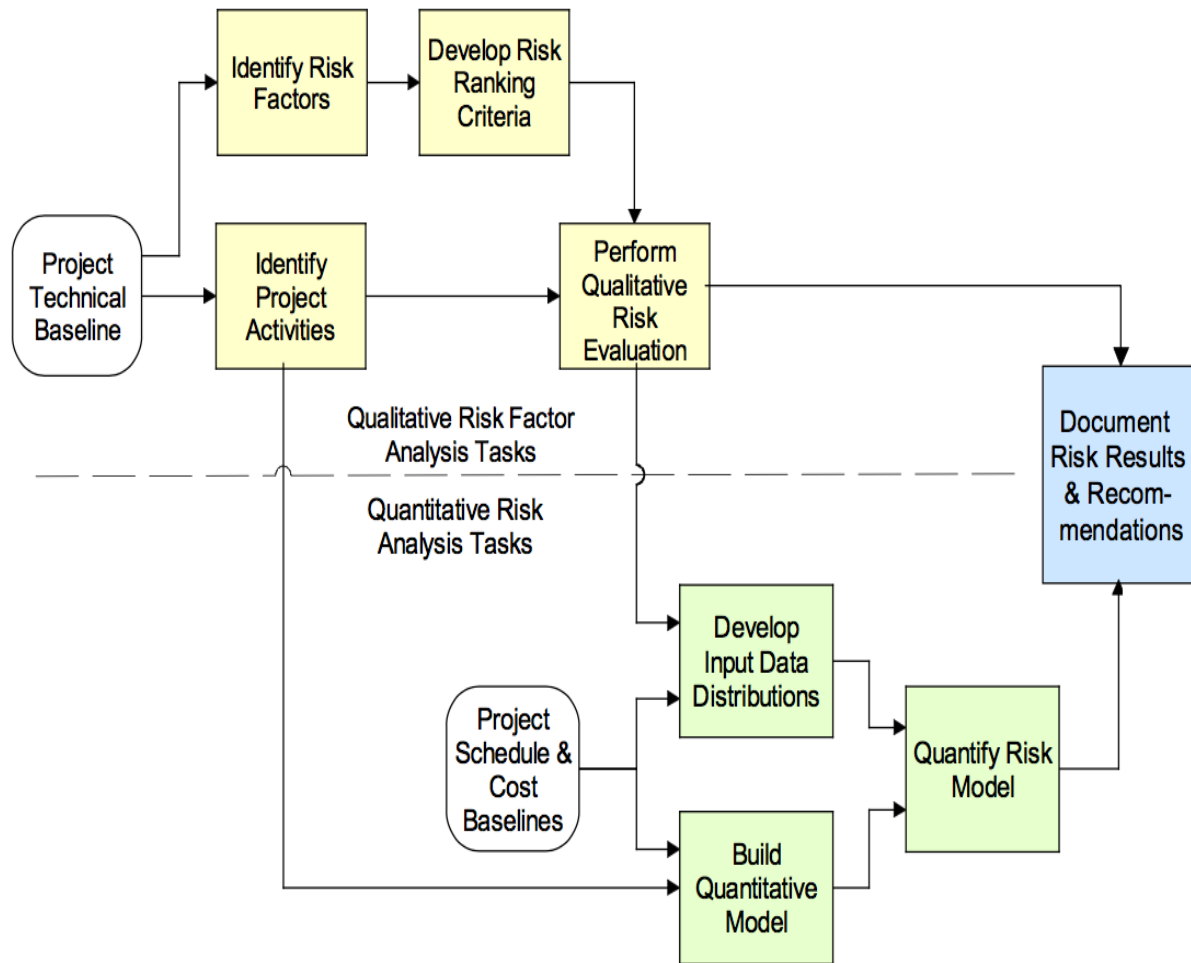


Figure 2.2 An integrated qualitative and quantitative risk analysis in a project

Source: Kindinger and Darby, 2000.

2.3.4 Risk response

For every identified risk in a project, it is the responsibility of the project manager and team to select an appropriate response for them. It involves a thorough evaluation and description of the identified risk response option to help select the appropriate response for the risk. The risk rating of the project forms the basis for selecting the best responses needed to mitigate the risk. Norris *et al.*, (2000) outlines two types of response to risk. The first is an immediate response; where changes are made to the project plan so that identified project risk mitigated or eliminated. The

second a contingency response, where provisions are made in the project plan for implementation should a severe risk emerge in the course of project implementation.

In planning for risk response, it is necessary to aim at reducing negative risk before they manifest and exploit the positive risk for the benefit of the project. Selecting a response for mitigating risk can involve tradeoff between project scope, cost and schedule. Dale *et al.*, (2005) summarizes the process of risk response planning as identifying the best option to minimize the probability or consequence of extreme risk, determining the cost and benefit of selecting the available option, selecting the appropriate option for managing the risk. Responses that form part of the contingency plan should have triggers to which such responses might be implemented. Broad, (2013) also affirm that the process involves coming out with possible courses of action, assessing actions available, determining the best course(s) of action and implementing the risk response based on the selection. In formulating the response plan, individuals or risk owners are assigned to the risk identified in the project. Inappropriate risk response plan can have a contrary effect on the project. Application of the best response strategy can help manage risk in a project.

2.3.4.1 Risk avoidance

Risk avoidance can also be referred to as risk elimination. It involves acting in ways to eliminate the impact of identified risks in a project especially risk with high priority threats and probability of occurrence. Making some changes to the project management plan can be used to eliminate some risk that are capable of affecting the project objective. Some practical examples include extending the schedule of project to help eliminate risks that could emerge because of tight schedules, adopting a different project strategy and making changes to the scope of the project. The aim is to make sure undesired events in a project are completely avoided by using alternative course of action.

2.3.4.2 Risk acceptance

The project team acknowledges that a particular risk exists but does not take an immediate action on it. This response plan is normally applied to risk that have been assessed to be of low priority or where it may not be economical to address the identified because it might be too small. A contingency plan is developed by the project team and implemented should the risk occur. This is an active response while the passive response involves working around the risk when it occurs.

2.3.4.3 Risk transfer

As the name implies it the transfer of identified risk in a project to another entity or third party to manage the risk should it occur. Outsourcing of a particular work to a sub-contractor, buying insurance policy and performance bonds are some of the ways of transferring risk in a project. The project team may adopt this response for risk like labour strike, conflict, bad weather and some other event that could be outside their control.

2.3.4.4 Risk mitigation

It involves taking actions to minimize the probability and impact of a risk on a project thereby making risk smaller and removing them from the list of high priority risk. Application of mitigation response at an early stage is more effective than repairing damages caused by the risk after its occurrence. Dale *et al.*, (2005) outlines the following steps in mitigation strategies:

1. Develop a contingency plan
2. Creating a quality assurance plan
3. Regular audit and checks for compliance
4. Crisis and disaster management plan
5. Well-developed terms and conditions of contract

Abu Rizk, (2003) also outlines actions that can be taken in response to residual risks. They include:

1. Aborting the intended risk if no tolerable and no other means can be used to mitigate damages
2. Transfer risk by contracting out some part of the work that need to be done.
3. Eliminating or avoiding risks through means such as partial or complete re design.
4. Obtaining information to reduce uncertainty thus revaluation of the likelihood and consequence of a risk.
5. Getting insured against the occurrence of a risk in a project.

2.3.5 Monitoring and controlling

White, (2008) states that in a project increasing productivity and reducing risks exposure to schedule escalation, cost and other project objectives are the responsibility of the risk management team. Controlling risk is the active influencing of all identified risk in the context of risk analysis in a project. Dealing with risk can be categorized into two; cause-related and effect related (Schieg, 2006). The cause- related aims to avoid risk in a project while the effect- related aims at reducing the amount of damage should the identified risk occur.

Monitoring risk in a project is the process of monitoring risk response plan, checking risks, monitoring residual risk and evaluating the effectiveness of the risk process throughout the project (PMI, 2017). Keeping records of relevant data in the monitoring and controlling process of risk management helps to anticipate the occurrence of any risk in the project. Monitoring and verification of identified risk must be carried out by people assign to those risks on continuous basis. As the project unfolds, new risks are identified as some anticipated risk disappear. According to (PMI, 2017) the purpose of monitoring risk in a project is to:

1. Determine if the risk responses implemented were effective.
2. Determine if the overall risk in the project has changed.
3. Determine whether assumptions made earlier in the project were still valid.
4. Determine if new risks have arisen
5. Determine if the approach in managing risk is appropriate
6. Determine if policies and procedures developed for risk management are being followed.

The Project Management Institute, (2017) gives an overview for the development of monitoring and control plan that is used to monitor and control risks in a project. It is grouped as input, tools and techniques and output.

Input to monitoring and control

1. **Project management plan.** This is a management plan on how the entire project will be managed to attain its objectives. It also contains the risk management plan, which gives guidance on how and when risk should be reviewed.
2. **Risk register.** This is a register that contains key input like risks that has been identified, owners of risks, agreed upon risk responses and their implementation action.
3. **Risk report.** This is a report that contain the assessment of the current project risk exposure and it agreed upon strategies to manage it.
4. **Work performance report.** This provides information on variance analysis, earned value data, project status and forecasting of data.

Tools and techniques for monitoring and control

1. **Data analysis techniques.** This technique is used for technical performance analysis and reserve analysis. The reserve analysis compares the amount of contingency reserve left to

the remaining to the amount of remaining risk during the course of the project implementation to determine if the reserve remaining will be sufficient.

2. **Risk audit.** Documents are reviewed to determine the effectiveness of the risk management process.
3. **Meeting.** Project team and the necessary stakeholders meet periodically to review project status and examine document regarding the identified risks in the project.

Output of monitoring and control

1. **Work performance information.** This is the analysis of all work performance data obtained during the implementation of the project. It involves comparing risks that have occurred with the expectation of how they would have occurred.
2. **Change request.** The implementation of risk management strategies may result in changes in the project management plan to respond to the risk. This will require change request to be performed by an integrated change control process.
3. **Project management plan updates.** Project management plan is updated as a result of changes that have been approved.
4. **Organization process and assets updated.** As the project is being implemented any new information gained are collected and stored for future use. Templates for managing risk, risk register, risk report and risk breakdown structure updated.

2.4 Risk in agriculture project

Deciding to start an agricultural project sounds simple but every decision made has its own consequences on project objectives. Farmers and stakeholders are constantly faced with making decision that cannot always be predicted with thorough precision; this is a risk. Project in the agriculture sector face more risk and uncertainties than any other sector owing to the fact that most

of their deliverables and services are related to natural process and biological assets (Hao, 2010; Girdžiūtė, 2012). Risks and uncertainties are inherent in agricultural projects and in the context of developing countries can be linked to a farming household living poverty (Riwthong *et al.*, 2017). The sources of risk in an agricultural project are many and diverse ranging from climatic condition to regulatory risk. These sources of risks to which farming households are exposed to, changes as they move from subsistence farming to a larger scale agricultural projects (Kahn, 2008). The complexity of the risks varies with the size of the project.

In a typical agricultural project, the project team and the stakeholders are concerned with the probability of high-risks and if those risks can significantly disrupt the project from achieving its objectives. Some stakeholders have the impression that managing one major risk means that the overall risk profile has been managed (Tans-, 2010). This is however not the case as a minor risk can later be a source of concern for the project or even hinder the achievement of project objectives. Risk not identified early in an agricultural project especially during its design stage might be at a risk of not being completed per the agreed budget, schedule and quality standards. Management of risk in an agriculture project ranges from informal activities like avoidance of cultivating high risky crops to formal mechanism like insurance (Jain and Parshad, 2006).

Sources of risks in an agricultural project can be because of poor project management practices and agronomic risk, which can be outside the control of the project team. For a successful project both sources of risks need to be managed properly.

2.4.1 Stakeholder engagement

Stakeholder is any individual whose interest can be affected by the project and can influence the success and failure of the project (Peter, 2008). Identifying all the key stakeholders and potential

stakeholders is important to the success of an agriculture project as their input can determine the success or failure of a project. Ignoring some stakeholders can increase the likelihood of a project failure. Not carrying out an extensive stakeholder analysis before the start of the project will mean not being able to know who can influence the success of the project and to what degree they can be affected by the project (International Finance Corporation, 2007). Even though it might be quite impossible to engage all stakeholders at all times, it is necessary to obtain their various requirements. When stakeholder needs, or requirements are not incorporated in the project, unexpected problems can be caused by the stakeholders especially the very influential ones. A clear definition of success or failure of the project may not be determined, and this might result in the project manager struggling to meet targets that were never intended by stakeholders (Meredith and Mantel, 2000). Aggrieved stakeholders can always find fault with project deliverables, not forthcoming with feedback when required, delay in approval processes, undermining project manager's authority and make the project unattractive to the public. Kalsern, (2002) also points out other problems that stakeholders can contribute to the failure of a project include frequent change of project scope, poor communication, not assigning adequate resource to the project and inciting negative community response to the project. These actions by stakeholders serves as a risk to project.

2.4.2 Poor project planning

Some project managers are tempted to start a project after acquiring the business objectives from their sponsors and stakeholders. They ignore the basic definition of their objectives and planning process required before the commencement of the project. Basic definition like completion date of the project, total cost of the project, how the intended scope of work will be accomplished need to thoroughly answered before the start of the project. However, failure to do so exposes the project

to problems like poor estimation of the project and scope creep (Mochal, 2003). Getting the buy in of sponsors and stakeholders becomes a challenge, as they do not have a full idea of what the project will achieve. Project team members may not fully understand what the project is about and therefore to fail to meet the objectives of the project.

2.4.3 Communication barriers

Communication barrier hinders free flow of information in a project environment (Mailarbari, 2008). Given the number of people and stakeholders involve in a project, meeting all their communication needs can be complex and possibly resulting in miscommunication in a project. Problems of this nature arise because of participants and stakeholders having different profession, multidisciplinary skills and different cultural background of stakeholders and project team members (Cheng *et al.*, 2001) especially virtual team members. As successful project recognizes the need for a good communication plan, a lack of its accuracy exposes the project to problems on regular basis (Monteiro de carvalho, 2008). Project team misunderstanding stakeholder requirements or the stakeholder failing to communicate their needs develops a gap between expectation, requirement and work packages. When information from key stakeholders is not forthcoming or not good enough essential decision making by the project team is stifled leading to failure of achieving project objectives (Liu, 2009; Xie 2002).

Using technology as a means of communication was perceived by stakeholders to be a panacea for all knowledge management and information distribution since it represents a high tangible and visible solution (Silver, 2002). The over reliance and assumption that all stakeholders and participants in a project are familiar with an adopted technology in a project is a mistake that can lead to communication breakdown. A chosen technology to be used as means of communication a

project without consultation of the users immediately creates a communication gap especially when they are not conversant with it.

2.4.4 Inadequate cost estimation

A good cost estimate is a key element for a successful project and is primarily concerned with the cost of all resources needed for the full completion of the project (PMI, 2017). Getting the cost estimate right is a boost for a project likewise a failure to get it right becomes a hindrance for achieving the goal of any agricultural project. When the project team fails to be guided by the approved budget and project management plan, they run the risk of cost overrun. Cost overrun might result from claims from subcontractor, late payments, changes of scope of work, delay in decision-making and poor estimation. When unplanned cost begins to accumulate in an ongoing project, sponsors and stakeholders may lose confidence in the project and may lead it being abandoned or cancelled.

2.4.5 Unrealistic project schedule

Agricultural projects like any other project are implemented over a defined period and must be completed within a given cost and quality requirement. Deliverables of most agriculture project are living organism and seasonal as well. This therefore require very realistic and accurate scheduling to enable the project to meet the intended objectives. Developing a schedule plan, which does allow for enough time for all required activities to be completed can result in the quality of deliverables being compromised. The project team might be compelled to fast track their work to meet project deadline. Wallace *et al.*, (2004) in their research stated that the longer the duration of a project the more the project becomes risky along the following dimension; planning and

control, organizational environment, project team, requirement of the project and project complexity.

Table 2.5 Project management risk

Poorly managed project	Poor defined project goal and objectives	Meeting end users expectations
Lack of solid project plan	Lack of user input	Bad decision
Poorly defined team roles and responsibility	Management of budget resources	Centralized proactive management decision to deal with risk
Scope creep	Vague requirements	
Unrealistic timeframe and tasks	Erroneous estimates of cost and schedule	Lack of organizational support
Lack of commitment by management	Insufficient resources	Business politics
Competing priorities	No established change control process	Team weakness

Source: www.projectsmart.co.uk (Accessed 10 July 2018)

2.4.6 Production risk

Projects in agriculture can be characterized high variability of production outcomes (Jain and Parshad, 2006). Unlike other projects, it is difficult to predict with certainty the exact amount of output or deliverables that the production process will yield due to external factors, which are

usually outside the control of the project team. Such factors include weather conditions, equipment efficiency, pest and disease.

2.4.7 Political risk

This risk results from government changes in policies and regulation that has the potential to influence agricultural activities in the country (Girdžiūtė, 2012). Some noted policies that can affect agricultural project include restriction on land use and environmental conservation policies, tax policy, credit policies and government subsidy. Sociopolitical instability within a country also pose a risk to project implementation.

2.4.8 Price or market risk

This originates from unpredictable currency exchange rates (Hardeker *et al.*, 2015). Prices of input that are used in the project might not be known due to the fluctuation of prices of items on the market. This result in lack of confidence in budget developed for the project.

2.4.9 Human and personal risk

Illness or death of a participant or key stakeholder in the course of implementing a project can disrupt its performance. Replacing them may also lead to some delays in the project as the new members will have to be updated on what the project is about and there is the possibility of them also having a different opinion about the project.

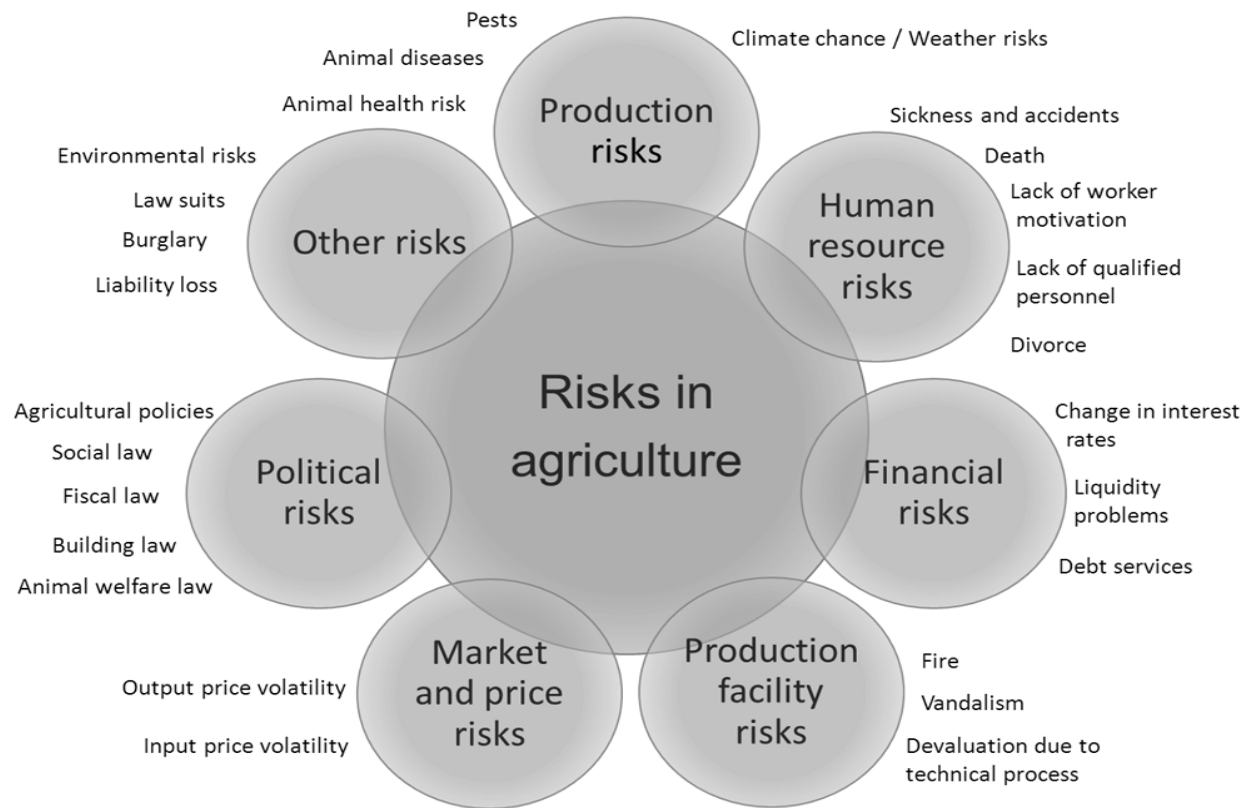


Figure 2.3 Risk in agriculture project

Source: Lehrner, 2002; Näther and Theuvsen, 2012

2.5 Smallholder concept

According to Zaney (2016), a smallholder is a farmer whose farm average 1.2 hectares. Majority of smallholder farmers live mostly in rural areas where they use family land or land acquired from elders of their various villages. Smallholder farmers usually rely on traditional cultivation using traditional methods for land preparation where this is done by family labour. Seeds or raw materials used for production are recycled from year to year from the same farm. The use of inorganic fertilizer is sometimes not a priority for improvement of soil fertility.

Operations of smallholder such as cultivation and rearing of animals are undertaken on small scale and does not often require the provision of vast services to significantly improve productivity (Muimba-Kankolongo, 2018).

According to Nandi *et al.*, 2017 in developing countries like India smallholder farmers are more comfortable producing within the context of particular season and selling to spot market without directing their production towards the requirement of the market.

With the emergence of organized retailing presents smallholder farmers with the opportunity to access profitable market given the sheer size of the market as well as premium price provided to those able to supply regularly and as per standards (Nandi *et al.*, 2017).

In addition, the increase of organized market chains in developing countries recognizes as not only a potential market opportunity for smallholder farmers but also an important instrument for reduction and development (Reardon *et al.*, 2008).

2.5.1 Oil palm smallholder scheme project concept

Over the past decades, global demand for oil palm has led to a fast rise in oil palm hectares and production (World Bank 2011). Palm oil, which is derived from oil palm, is used as raw material for many product found in household and industries. However, the extensive cultivation of oil palm and its sustainability is being argued worldwide.

Some studies have argued that smallholder is an attempt to produce oil palm in a more sustainable way. Roundtable on sustainable palm oil (RSPO) which is certification body defines scheme smallholders as farmers who are structurally bound by contracts, credit agreement or planning to a particular mill. The crop they cultivate is chosen for them and all their activities are supervised

thus planting and crop management. They are supervised, organized by managers of the estate or scheme to which they are linked to (Roundtable on Sustainable Palm Oil, 2018).

With the smallholder scheme there is always a mutual benefit for both the firm and the smallholder. The smallholder benefits from knowledge impartation, readily accessible supply chain and increased opportunity and as part of the scheme project objective to increase yield. An increase in yield also means an increase in income as the smallholder is able to supply more fresh fruit bunch to the firm. Euler *et al.*, (2017) revealed that the cultivation of oil palm by smallholders in Indonesia improved their household living standards. Their studies countered widely held public notion that oil palm expansion in Indonesia can negatively have some social effect.

However, Verburg, (2009) argues that smallholder scheme farmer may not always get the best price for their crop since they are contractually bound to supply their crop to the mill and may not have the luxury of bargaining for the price of the crop. The firm on the other hand is able to gain acceptance in the community thus its political status or influence with the locals or indigenes in the community where it is operating. Oil palm smallholders in West Africa produces about 90% palm oil for its domestic and regional market (Vermeulen and Goad, 2006).

According to Hasnah *et al.*, (2004) oil palm smallholder scheme agreement is a common model for which an organized plantation plot of about 1.5-5 hectares is prepared and planted by a company with oil palm and then handed over to a family or individual to manage as part of a bigger complex including crude palm (CPO) oil mills. This is model is known as the nucleus estate smallholder scheme (NES). This kind of model is very popular in Malaysia and Indonesia. The NES scheme forms a collaboration between the government-owned or private firms, which have the necessary capital and the smallholder, who can provide the labour. After 3-4 years when the oil palms are matured, the operations of the land and other activities are transferred to the smallholder (known

as the plasma) who are given the responsibility of developing the plantation under the supervision of the nucleus firm or company that are require to purchase their fresh fruit bunches. This model or concept facilitate the development of oil palm production within the tropics.

Studies by Spek and Goh, (2002) states that substantial arrangement are put in place to guarantee financing by the estate and the provision of technical support and agricultural supply or input like fertilizer to the smallholders. The smallholder on the hand agrees to sell the fresh fruit bunches to the nucleus company on a generated price formular with consideration given to the market price of crude palm oil, palm kernel oil and palm kernel extract, transportation and processing cost. All necessary payments by the smallholder are made when the palms become productive.

Jannot, (2003) revealed that the ‘estate’ model is widely used to promote oil palm development in Africa. This scheme, which started in the early 1960s, combined estates, smallholder and an industrial mill. State owned company with support from international agencies managed the model. The smallholder farmer is guaranteed of inputs and planting materials like seedling on credit basis, fresh fruit collection and technical assistance by the company. In Africa, countries known to be using this scheme include Nigeria, Ivory Coast, Benin and Ghana.

Presco, which is a private company, located in Nigeria and a subsidiary of SIAT of Belgium started a smallholder scheme during its expansion work in 2003. The development of smallholder scheme was part of the company aim of helping oil palm cultivation in Nigeria as well as realization of the company’s sustainable and income generation for the rural population. The smallholder farmer provided the labour whiles Presco supplied participating smallholder farmers with quality planting materials, fertilizer and other technical assistance. Persco made sure there was ready market for fresh fruit bunch from participating smallholder farmer (Biafra Nigeria World News, 2004).

In Ghana, Studies by Amanor, (2001), on smallholder schemes with reference to Ghana Oil Palm Development Company (GOPDC) shows that under the scheme the company develops and hand over oil palm plot to farmers. The nucleus or the company supply input like quality seedling, fertilizer and technical assistance. These inputs are on credit basis which will be deducted from their proceeds from the fresh fruit bunches they supply to the company.

From the review on oil palm concept of smallholder scheme project, it can be seen that both Africa and Asia uses the same concept. There is always a binding contract between the farmer and the company. In the NES scheme the input and necessary technical assistance are always given to the smallholder farmers. The smallholder scheme project is very popular in Asia and Africa and for that matter, Ghana is gradually catching up.

2.5.2 Challenges of smallholder scheme

The development of the oil palm smallholder scheme can not be without constraint that works against its full realization. Vermeulen and Goad, (2006) reported in their studies that the main constrain facing the smallholder scheme are ownership status, lack of access to reliable information, financial difficulties, balancing subsistence security with the production of cash crop and the notable problem of global price fluctuation. Kartohardjor and Supriono, (2000) stated that in the year 2000 many oil palm plantations in Sumatra had land disputes with the local communities in which they operate and this affected the expansion of their operation. Further studies by Serkat Petani Sawit, (2006) in Indonesia stated that holders of customary lands are also challenging the lack of recognition of the indigenous people right when allocating land for oil palm plantation and the bias and unfair practices in assigning plots to smallholders from large plantation. Land is very essential to a successful smallholder scheme. Tensions and misunderstanding sometimes arise as a result of land disputes within the communities and also against the companies

needing more land for smallholder expansion. Quartey, (2017) stated that the introduction of smallholder scheme has also led to an increase in land disputes and this has prevented many organizations from expanding the plans for the scheme.

Securing funds by smallholder farmer to meet their expenditure comes with a lot of challenges. Casson, (2000) reveals that when it comes to financing oil palm production, international and domestic financial institutions prefer providing funds to estate companies to smallholder farmers because lack of creditworthiness of smallholder farmers. Only a few oil palm plantation companies provide loans to support smallholders but some of them comes with stringent repayment terms. Others rely micro financial institution for financial aid.

Concerning getting access to information, Diermer *et al.*, (2004) revealed that the challenge is about not only the smallholder having access to information but also trusting and confidence in the information since independent source of information is rare.

2.5.3 Challenges of the smallholder scheme in Ghana

Quartey, (2017) outlines high cost of input, land acquisition, aging of farmers, price fluctuation and labour turnover as major constraint in the development of smallholder scheme in Ghana. Most input used in a smallholder in Ghana like fertilizer, harvesting knives and chemicals for field upkeep are not produced in Ghana but rather imported from other countries. The constant depreciation of the cedi against the dollar coupled with high level of inflation makes the cost of importing these inputs needed for successful implementation of a smallholder scheme high to organizations and for that matter the smallholder farmer. Ghana Oil Palm Development Company, (2007) reported that these inputs, credited to the farmers in the form of loan, worsen their burden

and deprive them of profits. Campaigns have been made for the government to subsidize inputs like fertilizer for the smallholder farmer to help lessen their plight (Damoah, 2012).

Aging of farmers is also a constraint to the development of smallholder scheme projects. At the inception of smallholder schemes in Ghana, plots were allocated to old family heads affected by the project to the detriment of competent young people in communities. Youth in most farming communities, have not been interested in farming due to the perception that it is reserved for old and uneducated people (Quartey, 2017). Most of these farmers are now old and therefore rely on contract labour for their field upkeep at a cost to them.

Land in Africa is seen as a scarce commodity and has complex ownership system. Depending on where one finds him or herself in Ghana, the ownership to land might be different (Damoah, 2012). Chiefs and community elders on behalf of the community manage some lands. This has led to fragmentation of land amongst various family heads and elders in communities. Acquisition of land for expansion of smallholder scheme projects has sometimes been met with litigation amongst custodians of land. Some notable land problems reported by Quartey, (2017) are “indeterminate boundary” and “double allocation”. Indeterminate boundary is when boundaries are not clear between neighbours while double allocation is when the same piece of land is assigned to different people. Most of these problems end up being resolved by the judicial court system. Delays by the judicial system tends to delay expansion works intended by companies and farmers. Ntsiful, (2010) in his studies made some revelation about Twifo Oil Palm Plantation’s land acquisition problem. Twifo Oil Palm Plantation acquired about 1000 hectares of land at Buabeng in the Central Region of Ghana to develop a smallholder scheme project for the indigenes but had to delay for many years due to land litigation among some chiefs in the communities over the ownership of the land.

High labour turnover is also a challenge in the oil palm sector. The ability of the other sector of the economy to pay more for skilled labour is causing the agriculture sector to lose potential staff Ntsiful, (2010). This situation is worsening by the price of crude palm oil often-experiencing price fluctuation for the past decade (Indexmundi, 2017). This situation has a negative turnover and profitability of the oil palm industry in the country. It is further escalated by the depreciation of the local currency thus the cedi against the dollar.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses the approaches, population, questionnaire design and statistical tool used in the analysis of data in the study. The research had the ultimate aim of exploring the risks pertaining to a smallholder scheme project in Ghana and developing management using Norpalm Ghana limited as a case study.

3.2 Research approach

A quantitative approach was used in the study. It was employed to quantify data obtained from the study and explain the outcome of the analysis. According to Creswell (1994), quantitative data is a numerical investigation in issues by testing theories or hypothesis to know the viability and the authenticity of such theories. It is advisable to use quantitative data if the study wants to achieve objectivity, credibility and real features of the world (Bouma and Atkinson, 1995). Quantitative data are expressed with numbers and uses statistical tools for analysis (Burns and Grove, 2001). A census approach was employed in the study because the size of the population was small as result all members of the smallholder scheme project were evaluated.

3.3 Profile of Norpalm Ghana limited

Norpalm Ghana limited is an oil palm plantation located about 27km west of Takoradi in the Western region of Ghana. The company is owned by Norpalm AS (68.6%) and PZ Cusson limited (31.4%). The nucleus estate of Norpalm Ghana limited is 4,500 hectares of which the total revenue area is 4031.89 hectares. The main produce of the company is crude palm oil and palm kernel oil.

Norpalm Ghana limited has a total permanent workforce 212 and over 1,200 third party workers. The vision of the company is to become one world's leading producer crude palm oil under safe and friendly environment.

3.4 Population

The population for the study was made up of management member, smallholder scheme manager, project team members and project leads. The total population size of the study was forty three The evaluation was made up of a senior management member who is also the plantation manager, the scheme manager, 6 project team members and 35 project leads (farmers).

3.5 Data collection

A questionnaire was used to collect primary data from Norpalm Ghana Limited's management member, scheme manager, project team members and project leads (farmers) for the study. The questionnaire was administered to all the participants involved in the study by the researcher.

3.6 Questionnaire design

To conduct the survey, a questionnaire was used as a tool to solicit for information from the respondents with the aim of the study in mind. Questionnaires are often designed for easier statistical analysis. The questionnaires were design based on some identified risk sources from Lehrner, 2002; Näther and Theuvsen, 2012 and Project smart, (2018). Questions asked respondents was short and concise as long questions can be confusing to the respondent if not aided (Podieh, 2015). The first part of the questionnaire required the respondent to provide general information about themselves. The second part of the questionnaire required the respondent to assess the probability and impact of each identified risks in a smallholder scheme project. A scale was provided for both risk probability and risk impact and it was required of the respondents to use the

scale provided to assess the probability impact of the various risks in a smallholder scheme project. The probability scale is a five point likert scale; 1-‘rare’, 2-‘unlikely’, 3-‘possible’, 4- ‘likely’ 5- ‘certain’ while the impact scale is 1- ‘negligible’, 2- ‘minor’, 3-‘moderate’, 4- ‘major’ and 5- ‘severe’.

3.7 Data analysis

Data analysis is the process of editing, altering and displaying data with the aim of emphasizing important information, deduction, suggestion as well as making supportive conclusion (Adèr, 2008). Data collected from the questionnaire were analyzed, concise, and interpreted with the help of descriptive statistical tool. Errors and omissions that arose were edited to ensure consistency in the data collected. The edited data was then coded into useable form thus categorized and entered into Social Package for Social Science software (SPSS version 24). The data were analyzed using mean score.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter of the study presents the findings and discussion. The presentation and discussion are in two section; the respondent background and risk assessment by the respondents involved in the smallholder scheme project at Norpalm Ghana Limited. The response rate was 100% as the entire participants in the smallholder scheme project responded to the questionnaire.

4.2 Respondent Background

Table 4.1 Background of respondents used in the study

Background of respondents		Frequency	Percentages
How long have you been in the agriculture sector?	0 - 5years	11	26%
	6 - 10years	4	9%
	11 - 15years	5	12%
	More than 15years	23	53%
	Total	43	100%
How many smallholder scheme projects have you been involved in?	0 – 5	39	91%
	6 - 10	2	5%
	11 - 15	1	2%
	More than 15	1	2%
	Total	43	100%

Have you ever conducted risk identification and analysis?	Yes	27	63%
	No	16	37%
	Total	43	100%
Do you consider risk identification and analysis important in a smallholder scheme projects?	Yes	43	100%
	No	0	0%
	Total	43	100%

Source: Field Survey, 2018

Respondents were asked to indicate how long they have been working in the agriculture sector as shown in table 4.1, twenty-three of the respondents representing 53% have been working in the agriculture sector for more than fifteen years, eleven of them have been in the agriculture sector within the last five years, representing 26%. Five of the respondents representing 12% have been working in the agriculture sector for between eleven to fifteen years whiles four respondents making 9% have been working in the agriculture sector between six to ten years. Information from the respondents can be credible as they have been working in the agriculture sector for a while.

From the analysis majority of the respondent thus 39, representing 91% have been involved in five and less smallholder scheme projects. Two of the respondents representing 5% have participated in between six to ten smallholder scheme projects whiles two respondents 4% have been involved in eleven and more smallholder scheme projects. It can be said that participants knowledge in a smallholder scheme project can play a role in its success as they bring on board experience from other smallholder scheme projects they have managed

Out of the 43 respondents used in the study, twenty-seven (27) respondents representing 63%, have one point in time conducted risk identification and analysis while sixteen of the respondents representing 37% have never conducted risk identification and analysis. The figures from the respondent can be of concern as it shows that projects are often initiated without prior risk identification and analysis.

All the respondents involved in the study unanimously agreed that identifying and analyzing risk is important in establishing a smallholder scheme project. The researcher can conclude that risk identification and analysis should always be conducted before the commencement of any smallholder scheme project.

4.3 Risk assessment

To make the analysis more meaningful, the various risk score was assigned code. Risks with scores between one to three were assigned the value one, four to ten assigned the value two, eleven to eighteen were assigned the value three and scores above nineteen the value four. These codes were input into the SPSS software to run the analysis.

Table 4.2 Risk score and priority

Risk score	Risk priority	Mean score
1-3	Low	0-1.9999
4-10	Medium	2-2.9999
11-18	High	3-3.9999
19 above	Very high	4-4.9999

Source: Field survey, 2018

Table 4.3 Project management risk in a smallholder scheme project.

No.	Description of risk	Mean	Standard deviation	Risk priority	Ranking
1	Stakeholders selection process and engagement	3.0465	.87160	High	1 st
2	Team members with negative attitude towards project	2.8837	.87856	Medium	2 nd
3	Financial difficulties	2.8372	.84319	Medium	3 rd
4	Occupational health and safety	2.7907	.91439	Medium	4 th
5	Communication methods	2.7907	.98942	Medium	5 th
6	Lack of training	2.6512	.71991	Medium	6 th
7	Resource shortfall	2.5581	.79589	Medium	7 th
8	Inexperienced resource/team members	2.4884	.70279	Medium	8 th
9	Inaccurate cost estimates	2.4651	.73513	Medium	9 th
10	Planning deficiencies	2.4419	.66556	Medium	10 th
11	Late arrival of procured items	2.3953	.82056	Medium	11 th
12	Price inflation	2.3721	.81717	Medium	12 th
13	Scheme design	2.3256	.64442	Medium	13 th
14	Poor documentation	2.3256	.80832	Medium	14 th
15	Inaccurate schedule estimate	2.2093	.59993	Medium	15 th
16	Mistakes and discrepancies in contract document	2.1628	.65211	Medium	16 th

17	Political instability	1.9767	.98774	Low	17 th
18	Delay by consultant on the project	1.9535	.75446	Low	18 th

Source: Field Survey, 2018

Stakeholder selection process and engagement was ranked by respondents in the smallholder scheme project to be the highest risk associated with a smallholder scheme project with a mean score of 3.0465 and a standard deviation of 0.87160. It is a high-risk priority meaning it can have an effect on the success of the project. Identifying all stakeholders especially the key ones before a project starts is very important for success of the smallholder scheme project. It is necessary to put in place strategies or plans that will help select the right stakeholders who will be involved the project. The engagement of these stakeholders involves the use structured dialogue seeking understanding and solution to issues of shared concern. Failure to get the stakeholder selection and engagement right can lead to problems and uncertainty in a project (Ayatah, 2012). Stakeholder can always find fault in the project, delay process that need urgent approval, undermine authority of the project manager and lack of feedback on deliverables and milestone. Not carrying out an extensive stakeholder analysis before the start of the project will mean not being able to know who can influence the success of the project and to what degree they can be affected by the project (International Finance Corporation, 2007).

Team members with negative attitude towards the project followed. It had a mean score of 2.8837 and a standard deviation of 0.87856. Team members' attitude in a smallholder scheme project is very critical, as they are responsible for the planning and implementation of the project management plan. When team members are not forth coming in smallholder scheme project, the success of the project can be affected. The success of the project depends the willingness of the team to take on task that will ensure the project meeting its objectives. Lack of cohesion amongst

the project team can result in conflict, delays and possible sabotage of the project. A successful project will require a total commitment from the entire team.

Financial difficulties were the third highest ranked project management risk in a smallholder scheme project. It recorded a mean score of 2.8372 with a standard deviation of 0.84319. Adequate finance is very important in realizing the objectives of a given project. Most of the activities in a smallholder scheme are financial driven as it requires the purchase of input like planting material, fertilizer and other logistics (Dorfman and Cather, 2013). Lack of it can make the smallholder scheme project handicap. Respondents ranking financial difficulty as the third most important risk in a smallholder scheme highlights the need of securing sufficient funds for a project. The risk of financial difficulties includes the ability to meet financial obligation to other partners in the project.

Communication methods adopted for use in a smallholder scheme project as well as health and safety issues both had a mean score of 2.7907. Communication barrier hinders free flow of information in a project environment (Mailarbari, 2008). Choosing a communication method that the project team members and other stakeholders are not familiar with can hinder the flow of information in a smallholder scheme project. Also, when the project team does not understand stakeholder requirements, or the stakeholders fail to properly communicate their needs, a gap develops between expectation, requirements and work packages. When information from key stakeholders is not forthcoming or not good enough essential decision making by the project team is stifled leading to failure of achieving project objectives (Liu, 2009; Xie 2002).

Occupational health and safety being ranked fourth could be attributed to the fact that developing a smallholder scheme project involves the use of heavy and technical equipment in operations such as land preparation. The presence of reptiles in secondary and virgin forest being used for

smallholder scheme project also pose a threat to the safety of the workers involved in the project. According to the World Health Organization, (1999) health is a “state of complete physical, mental and social wellbeing and not only the absence of disease or informality”. Thus, safety and health is preventing and protecting employee’s and people from injury and occupational disease in any form due to hazards and possible risks that can harm, injuries, lead to unsafe environment to people or damage facilities at the workplace. Oxenburgh *et al.*, (2004) stated that the health and safety of all employees is very much linked to the company’s productivity. Injuries occurring in the project can lead to absenteeism and consequently slow the pace at work is done as well as low productivity.

Lack of training for project leads and all involved in the smallholder scheme ranked sixth with a mean score of 2.6512 and a standard deviation of 0.71991. Ranking lack training as the sixth most important risk agrees with their unanimous indication that risk identification and analysis is important in a smallholder scheme project. A lack of training may result in project team members and project leads not being abreast with new best practices and may become inefficient in the smallholder scheme project. Training activities is necessary to sensitize farmers and project leads on the need for systemic risk management (Theusven, 2013).

Out of the eighteen project management risks identified in a smallholder scheme project, the risk of resource shortfall had a mean score of 2.5581 and a standard deviation of 0.79589 placing seventh on the list. The smallholder scheme project is most likely to delay in meeting their objectives when resources needed for the implementation of the project is not available. Failure to acquire the necessary resources for the project may affect smallholder scheme project’s schedules, budgets, customer satisfaction, quality, and risks. Insufficient resources or capabilities decrease the probability of success and, in a worst-case scenario, could result in project termination (PMI 2017).

Inexperience team members and inaccurate cost estimates were ranked eighth and ninth with mean scores of 2.5081 and 2.4884 respectively. Having many inexperience team members in a project can slow down the rate at which work progresses in a project. They may not be familiar with most of the best management practices and will therefore have to be taught. This will eventually take some the projects time resulting in the slow pace of work. They tend to be inefficient in their work and their action can result increase in project cost (Fallis, 2013).

Inaccurate cost estimates can prolong the duration of the smallholder scheme project as funds budgeted earlier for an activity might not be sufficient hence other funds will have to organize again. This might take some time, as it has to go through approval processes. Studies by Ganuza, (2007) reveal that inaccurate cost estimates in projects leads to cost overruns and they can have negative impact on a project.

Respondents in the study ranked planning deficiency tenth. It had a mean score of 2.4419 and a standard deviation of 0.66556. The success of a project starts by getting the planning stages right. Too often, the project manager and the team jump into whatever they are doing without thinking about it beforehand and such actions leads to inefficiency, rework, mistakes, conflict and needless overtime (Fallis, 2013). Planning deficiencies in a smallholder scheme project put extra burden on the project. It can lead to financial burden, rework, delays in project completion, and other legal issues.

Late arrival of procured items for a smallholder scheme project had a mean score of 2.3953 and a standard deviation of 0.82056. It ranked eleventh amongst the eighteen identified project management risk in smallholder scheme project. Items procured for the smallholder scheme project need to arrive on time or as schedule. A delay in the arrival of the procured items can have ripple effect on other operations within the smallholder scheme project. This may lead to delays

in the project, claims and other legal actions (Fallis, 2013; PMI, 2017). In developing a smallholder scheme project items like a tractor, fertilizer and planting material need to be available on time for use by the project team as almost all other operations are centered on them.

Price inflation ranked twelfth on the list with a mean score of 2.3721 and a standard deviation of 0.81717. This originates from unpredictable currency exchange rates (Hardeker *et al.*, 2015). Frequent changes in the prices of goods and items can affect the health of the smallholder scheme project. In the preparation of a budget for a project, bids from contractors and suppliers and other expenses are incorporated into final budget. A change in the unit price of items can result in changes in the final budget of the project. In today's economy, agribusiness firms face a high degree of risk because of certain new factors, such as greater price volatility for inputs and outputs, international trade restrictions, and new and more stringent food safety standards (Broll, Welzel and Wong, 2013). These risks are often outside the control of the project team.

Scheme design and poor documentation had the same mean score of 2.3256 but a variation in their standard deviation. The scheme design had a standard deviation of 0.64442 while poor documentation had a standard deviation of 0.80832. When the scheme design is vague and very complex, it exposes the smallholder scheme project to lots of risks (PMI, 2017). For a successful scheme implementation, the scope of scheme ought to be thoroughly defined so that project team can successfully implement it. When this is lacking in a project the whole team may become unproductive as there will be no clear goals guiding them on what to do. Poor documentation in an ongoing smallholder scheme project can also affect the health of the project.

Poor documentation within a project hampers the flow of information within a project (Liu, 2009; Xie 2002). Most often smallholder scheme projects are complex and involve lots of people from different professional backgrounds who also require different information to enable them perform

their task in the project. When there is no proper records or good information repository from which people in the team can use, the rate at which work is accomplished can be reduced as time will have to be spent to get the required information.

Inaccurate schedule estimate followed with a mean score of 2.2093 and a standard deviation of 0.59993. It was ranked fifteenth on the list. As stated earlier in the literature review, agricultural projects like any other project are implemented over a defined period and must be completed within a given cost and quality requirement. Deliverables of most agriculture project are living organism and seasonal as well. This therefore require very realistic and accurate scheduling to enable the project to meet the intended objectives. Developing a schedule plan, which does allow for enough time for all required activities to be completed can result in the quality of deliverables being compromised. The project team might be compelled to fast track their work to meet project deadline. Wallace *et al.*, (2004) in their research stated that the longer the duration of a project the more the project becomes risky along the following dimension; planning and control, organizational environment, project team, requirement of the project and project complexity. Inaccurate cost estimate may lead to delays in project completion.

Mistakes and discrepancies in contract document put extra risk in the project. Respondents ranked mistakes and discrepancies in contract document risk as sixteenth. Its mean score was 2.1628 and a standard deviation of 0.65211. It is always necessary to the project manager and the team to produce a contract that is clearly understood by all parties involved in the contract and is not ambiguous. Poorly written contract exposes the whole smallholder scheme project to contradiction in document, pre-termination and legal battle. It can also lead to claims by seller if things do not go as expected (PMI, 2017).

Political instability had a mean score of 1.9767 with a standard deviation of 0.98774. This risk has the ability to bring the project to a halt. Political instability exposes the project to security-related risks; uncertainty associated with sociopolitical instability within a country or in neighboring countries; interruption of trade due to disputes with other countries; nationalization or confiscation of assets (Jaffee, Siegel and Andrews, 2010). Smallholder scheme projects under these conditions will often not be completed.

Delay by consultant which is the least had a mean score of 1.9535 and a standard deviation of 0.75446. Some organizations adopting smallholder scheme project as part of their cooperate social responsibility have relatively inexperienced project team and therefore rely on consultants to aid them in the development of their project management plan (Amponsah, 2010; Damoah, 2012). The progress of work is affected when consultant on the work is not forthcoming or delays. They often depend on the consultant to guide them in the implementation of the project.

Table 4.4 Agriculture risk associated with a smallholder scheme project.

No	Description of risk	Mean	Standard deviation	Risk priority	Ranking
1	Land litigation	3.2326	.75078	High	1 st
2	Weather condition	2.9767	.91257	Medium	2 nd
3	Pest and disease management	2.9070	.83990	Medium	3 rd
4	Soil fertility	2.7209	.79659	Medium	4 th
5	Poor planting material	2.2093	.77331	Medium	5 th
6	Flood	2.0233	.59715	Medium	6 th

Source: Field Survey, 2018

With agricultural risks associated with smallholder scheme project, land litigation was ranked highest with a mean score of 3.2326 and standard deviation of 0.75078. The researcher can attribute this to the numerous litigations surrounding lands in Ghana as well as the nature of land tenure or ownership system in the country. Land for expansion of smallholder scheme project; land dispute has been identified as a constraint causing companies to limit their expansion plans (Ntsiful, 2010). Land is viewed as sacred commodity and is often administered by chiefs on behalf of the whole community and unborn children. The acquisition land for smallholder scheme project can be met with litigation amongst family members as the true ownership of the land.

The weather condition was also ranked second highest risk with a mean score of 2.9767 and a standard deviation of 0.91257. The deliverables of the smallholder scheme projects are dependent on the weather condition however the weather conditions are not under control of the project team and are therefore at the mercy of the weather. Any severe weather condition can greatly affect the smallholder scheme project. Climate change will result in changing weather conditions, including higher temperatures, changing quantities and seasonal distribution of rainfall, and more extreme weather phenomena, such as droughts, heavy rains, storms and extreme high or low temperatures (Theuvsen, 2013).

An outbreak of pest and disease can cause severe loss of deliverables of the smallholder scheme project (Kahan, 2013). The deliverables of smallholder scheme project are susceptible to pest and disease attack. The deliverables are biological in nature and require much attention as the slightest pest or disease attack can result in the project not achieving its objectives and possibly bring the project to a halt. Pest and disease management had a mean score of 2.9070 and a standard deviation of 0.83990. It was ranked third amongst the identified agricultural risks associated with a smallholder scheme project.

Soil fertility was ranked fourth with a mean score of 2.7209 and standard deviation of 0.79659. Respondents might be of the opinion that not getting a soil, which is fertile for cultivation, may affect the outcome or quality of the intended deliverables. Crops cultivated in infertile soil produce low yields (Kahan, 2013). The yield from the smallholder scheme project is of great importance to the project as it is one of the main deliverables of the project. Therefore, choosing a location which has low soil fertility for the project can hamper its success.

Poor planting material as risk in smallholder scheme project was ranked fifth with a mean score of 2.2093 and a standard deviation of 0.77331. The profitability of the smallholder scheme project is very much dependent on getting the right planting material for the project. It is always necessary to use good planting material when establishing an oil palm plantation (Ntsiful, 2010). Good planting materials together with good agronomic practices can lead to higher yields and the vice versa. Selecting any planting material without paying attention to its quality exposes the smallholder scheme project to risks. Once the expected yields are not being realized as a result of the poor planting material there is the possibility that the objective of improving the living of the smallholder farmers cannot be met.

Flood was ranked as the least risk that can affect smallholder scheme project according to the respondents. It recorded a mean score of 2.0233 and a standard deviation of 0.59715. Some weather-related risks such as floods have a systemic component in that they affect most farmers within the whole region or country (Managing risk in agriculture: a holistic approach, 2009). Floods when they do occur can have a big impact on the smallholder project. Severe floods are often outside the control of the project manager and the project team as it can be as a result of natural factors.

4.4 Risk response strategy

After the identification and assessment of risk, the project manager and the team will need to determine the appropriate response strategy for the identified risks. The response strategy used in managing these identified risks can affect the outcome or success of the project.

Table 4.5 Risk response strategies for project management risk in smallholder scheme project.

No.	Description of risk	Risk priority	Risk response strategy
1	Stakeholders selection process and engagement	High	Avoid
2	Team members with negative attitude towards project	Medium	Mitigate
3	Financial difficulties	Medium	Mitigate
4	Occupational health and safety	Medium	Mitigate
5	Communication methods	Medium	Mitigate
6	Lack of training	Medium	Mitigate
7	Resource shortfall	Medium	Mitigate
8	Inexperienced resource/team members	Medium	Mitigate
9	Inaccurate cost estimates	Medium	Mitigate
10	Planning deficiencies	Medium	Mitigate
11	Late arrival of procured items	Medium	Mitigate
12	Price inflation	Medium	Transfer/Mitigate

13	Scheme design	Medium	Mitigate
14	Poor documentation	Medium	Mitigate
15	Inaccurate schedule estimate	Medium	Mitigate
16	Mistakes and discrepancies in contract document	Medium	Mitigate
17	Political instability	Low	Accept
18	Delay by consultant on the project	Low	Accept

Source: Field survey, 2018

Table 4.6 Risk response strategies for agricultural risk in smallholder scheme project

No	Description of risk	Risk priority	Ranking
1	Land litigation	High	Avoid
2	Weather condition	Medium	Transfer
3	Pest and disease management	Medium	Mitigate
4	Soil fertility	Medium	Mitigate
5	Poor planting material	Medium	Mitigate
6	Flood	Medium	Transfer

Source: Field survey, 2018

It is important to adopt appropriate strategies in managing risk associated with the smallholder scheme project. Low risk priority in a smallholder scheme project can be accepted (PMI, 2017). This is recommended when it is not possible or cost effective to manage the identified risk in any

other way. A contingency reserve including extra time, funds or resources can be used if this risk occurs. Medium priority risk can be managed in a smallholder scheme project by applying either a transfer or mitigation strategies, or a combination of both. Transfer strategy involve the transfer of the risk to a third party to manage the risk and bear the consequence (PMI, 2017). Mitigating a risk also involve acting to reduce the likelihood of occurrence and impact of an identified risk in a project. High risk priority like land litigation and stakeholder selection process and engagement which is associated with smallholder scheme project should be avoided. In avoiding an identified risk, the project team acts to eliminate the risk from occurring.

Developers of smallholder scheme project should avoid using stakeholders and engagement processes that fails to include all relevant stakeholders in the smallholder scheme project. Stakeholder selection and engagement process risks if not avoided can later affect the success of the project as any new stakeholders might want to make changes to some of the things in the project.

In mitigating team members with negative attitude towards project, the project manager should engage people who are willing and have shown interest in the project are selected to be part of the smallholder scheme project. Selection of team members must not be by compulsion.

Inaccurate cost estimate and financial difficulties can be mitigated by the project manager and the team. The project manager and the team will have to be diligent in developing their cost estimate for the project thus making sure the cost associated with every activity is captured and also make provision for contingencies. The sponsor and stakeholders will also need to secure enough funds for the completion of the project possibly before its commencement.

With occupational health and safety risk, the culture of practicing safety should be inculcated into the project team and project leads. The team will also have to be trained on occupational health and safety issues.

Mitigating risk in communication method will require using methods or technologies that all the stakeholders are familiar with. Engaging stakeholders to know which method of communication they prefer is one of the ways of dealing with risk associated with communication method.

Training the project team and project leads can be used to manage the risk associated with lack of training the project team and project leads. When the project manager realizes the project team lacks the necessary knowledge or skill in particular area, training can quickly be organized for them to bridge the gap.

The sponsor and the stakeholders of the project should ensure that all the necessary resources that will be required by the project manager and the project team are available. The project team in their planning should make plans for resources that they do not own but will be needing in the future and act promptly in getting those resources when the need arises. This will help solve the risk of resource shortfall.

In mitigating the risk associated with inexperienced team members, the project manager can provide training for those members who are inexperienced. It is also necessary to engage members with knowledge in project management.

Mitigating risk in planning deficiencies involve allocating enough time for the planning activities. Basic definition like completion date of the project, total cost of the project, how the intended scope of work will be accomplished need to be thoroughly answered before the start of the project.

The risk associated with late arrival of procured items can be mitigated by project team by procuring items that will be needed for the project ahead of time. Certain clause or conditions can be inserted the contract signed with the seller of the item to get them to deliver on time.

The inflation of prices items used in the smallholder scheme project is outside the control of the project team. With reference to literature, the project team in their planning activities can make provisions to cater for inflation of items that may occur during the implementation of the project or outsource the supply of certain items to third party. The third party bears the any risk that might arise a result of price inflation.

Risk associated with scheme design can be mitigated by involving all stakeholders in the planning and design of the smallholder scheme project. The contribution and requirements of the stakeholders must be documented and used in the design of the scheme. Things that do not align with the objectives of the smallholder scheme project must be excluded.

It is the responsibility of the project manager and the project team to develop contracts and documents that are void of mistakes and not ambiguous as well. The help of professionals in writing contract can be sought to help develop a standard contract. The project team must ensure that every activity carried out in the project is properly documented and archived.

The project manager and the project team can mitigate inaccurate schedule estimate by assigning realistic time lines for every activity. Some deliverables of the smallholder scheme projects are seasonal therefore the planning activity in the project must take all these into considerations. All relevant information must be sought during the planning stages to help come out with a realistic schedule.

With reference to literature reviewed the risk priority associated political instability and delay by consultant is low in a smallholder scheme project can be accepted without it having any major impact on the success project.

Stakeholders should as much as possible avoid using land that are under any form of litigation for the smallholder scheme project. Due diligence must be made when acquiring land for the smallholder scheme project.

Floods and weather conditions are outside the control of the project team. These risks can be transferred to a third party by using insurance cover to take care of any unfortunate incident that may occur and has the capacity to affect the project.

Mitigating pest and disease risk can be achieved by carrying out regular phytosanitary monitoring. The application of recommended pesticides can also be used in the control of any pest that may be encountered. In addition, adopting an integrated pest management system can be used to control pest and disease infestation.

In mitigating soil low in fertility, the project team should select location which have fertile soils. Soil fertility test should be carried out to determine if the selected location is fertile enough to support the smallholder scheme project. Selection of location should not be done randomly but rather with the help of a soil scientist.

Only certified planting material should be used in the smallholder scheme project. Using certified planting material can be as to mitigate the risk associated with poor planting material. It is very important that only good planting material are planted in the smallholder scheme project. Using poor planting material will lead to low yields.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter of the study summaries the findings, draws conclusion on the study and also makes recommendations on how to effectively manage risks associated with a smallholder scheme project based on the result of the study. The study was conducted with aim of exploring risks associated with Norpalm Ghana Limited's smallholder scheme project and assessing their impact on the project.

5.2 Summary of findings

The study was driven by the aim of exploring the risks pertaining to Norpalm Ghana Limited's smallholder scheme project with two supporting objectives, which are identification of Norpalm Ghana Limited's smallholder scheme project risks and assessing the impact of the identified risks in Norpalm Ghana Limited's smallholder scheme project.

Research question that were to be answered include the following:

1. What are the risks associated with Norpalm Ghana Limited's smallholder scheme project?
2. What is the impact of each identified risk on Norpalm Ghana Limited's smallholder scheme project?

5.2.1 To identify risks associated with Norpalm Ghana Limited's smallholder scheme project

Through the review of literatures, a total number of twenty-four risks were identified. These identified risks were categorized into two namely; project management risks and agricultural risks. The project management risk associated with Norpalm Ghana Limited's smallholder scheme

project were eighteen in number. It included planning deficiencies, inaccurate cost estimates, communication method, financial difficulties and poor documentation as shown in table 4.3. Six agriculture risks were also identified. Land availability, poor planting material, soil fertility and pest and disease management are amongst the agriculture risks associated with a smallholder scheme project as shown in table 4.4.

5.2.2 Assess the impact of the identified risks on Norpalm Ghana Limited's smallholder scheme project.

The study also sought to determine the impact of the explored risks on Norpalm Ghana Limited's smallholder scheme project. The study revealed that one out of the eighteen identified project management risks thus stakeholder selection and engagement was of a high-risk priority, fifteen of them were classified as medium risk priority while two were of a low risk priority.

With the six agricultural risks identified in a smallholder scheme project, five of the risks were considered by the respondents as medium risk priority, and one thus land availability for the project was categorized high-risk priority.

In all, two (8.33%) of the identified risk were of a high-risk priority, fifteen (83.33%) were categorized by respondents as medium risk priority while two (8.33%) were categorized as low risk priority in a smallholder scheme project.

5.3 Conclusion

Risk as discussed earlier can have either a positive or a negative effect on a project. A project manager having knowledge of the risks associated with a project is very important as it helps in effective planning to curb all problems that may occur during the implementation of the project.

The agricultural sector is unique, and it is having its own challenges.

The study concludes on the following:

1. Almost all the explored risk reviewed has varying effect on Norpalm Ghana Limited's smallholder scheme project.
2. Majority of these risks have a medium risk priority (83.33%) in Norpalm Ghana Limited's smallholder scheme project.
3. Agriculture risks associated with the smallholder scheme project has a higher impact (2.6783) than the project management risk (2.4819).

The ten most important risks that project managers and stakeholders need to be mindful of when developing a smallholder scheme project include the following:

1. Land availability
2. Stakeholder selection process and engagement
3. Weather condition
4. Pest and disease management
5. Team members with negative attitude towards project
6. Financial difficulties
7. Health and safety issues
8. Communication methods
9. Soil fertility
10. Lack of training

5.3 Recommendation

It will be elusive to assume that all risk in a smallholder scheme project can be eliminated through the application of the best risk management processes. Its aim is to ensure that all identified risks in a project are managed in an efficient manner. This section of the study draws on the various outcomes to make the necessary recommendation that may be useful to the developers of smallholder scheme project. The following are recommended:

1. Project managers and stakeholders should train their project team on risk management process so that they can be proactive in managing risks in a project as well advance the business of the firm. They will therefore not need to rely always on the project manager to instruct them on what, when, how things ought to be done.
2. Organization should engage team member and select project leads with background in risk management. This will make it easier to manage all identified risks in a smallholder scheme project. Working in a project where project team members are knowledgeable in a subject matter thus, risk to be specific creates confidence within the group.
3. Risk identification and analysis procedure should be integrated into the firm's business culture.

5.4 Recommendation for further study

To enable help developers of smallholder scheme projects appreciate the risk management, it recommended that similar studies be conducted in other organization undertaking smallholder scheme project.

5.5 Limitation of study

The researcher was faced with some constraint during the study. One of the constraints was the delay in getting feedback from the respondents. The researcher had to wait for longer period for respondents to complete the questionnaire due to the busy schedules of some respondents. Some respondents thought the study will result in some sort of victimization. However, an attempt was made for the respondents to be as transparent as possible and were also assured of the confidentiality of their response.

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APPENDIX 1

KWAME KNRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF ART AND BUILT ENVIRONMENT

DEPARTMENT OF BUILDING TECHNOLOGY

Dear Sir/Madam

**SURVEY QUESTIONNAIRE. RISK MANAGEMENT IN A SMALLHOLDER SCHEME
PROJECT IN GHANA. CASE OF STUDY THE NORPALM GHANA LIMITED.**

My name is Nii Lante Lamptey, MSc. Project Management student from the Kwame Nkrumah University of Science and Technology.

This research questionnaire is to solicit your opinion on risk management in Norpalm Ghana Limited. It is aimed:

1. Explore the risks of Norpalm Ghana Limited's smallholder scheme project.
2. Assess the impact of the explored risk in Norpalm Ghana Limited's smallholder scheme project.

Your participation is voluntary, and information provided will be used for academic purpose only.

The findings from this study will help developers of smallholder scheme project to manage risk associated with the scheme more effectively.

Your cooperation will be appreciated.

Thank you.

NII LANTE LAMPTEY

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SECTION 1 RESPONDENT BACKGROUND

1. How long have you been in the agriculture sector?

a) 0 – 5 years ()

b) 6 – 10 years ()

c) 11 – 15 years ()

d) More than 15 years ()

2. How many smallholder scheme projects have you been involved in?

a) 0 – 5 ()

b) 6 – 10 ()

c) 10 – 15 ()

d) More than 15 ()

3. Have you ever conducted risk identification and analysis?

a) Yes ()

b) No ()

4. Do you consider risk identification and analysis important in a smallholder scheme project?

a) Yes ()

b) No ()

SECTION 2: RISK ASSESSMENT

Below are a list of risk that may be encountered in a smallholder scheme project. From your experience in smallholder scheme project please use the scale below to indicate the probability and impact of the risk in a project.

Probability:	Rare 1	Unlikely 2	Possible 3	Likely 4	Certain 5
Impact:	Negligible 1	Minor 2	Moderate 3	Major 4	Severe 5

Risk Priority	Risk Rating
Low	1-3
Medium	4-10
High	11-18
Very High	19 above

	Description of Risk	Probability P	Impact I	Risk Score P*I=
1	Project Management Risk			
2	Stakeholders selection process and engagement			
3	Planning deficiencies			
4	Inaccurate cost estimates			
5	Communication methods			

6	Financial difficulties			
7	Mistakes and discrepancies in contract document			
8	Political instability			
9	Scheme design			
10	Resource shortfall			
11	Inaccurate schedule estimates			
12	Team members with negative attitude toward project			
13	Inexperienced resource/ team members			
14	Poor documentation			
15	Lack of training			
16	Late arrival of procured items			
17	Delay by consultant on the project			
18	Price inflation			
19	Occupational health and safety			
	Agriculture Risk			
20	Land litigation			
21	Poor planting material			
22	Soil fertility			
23	Pest and disease management			
24	Weather condition			
25	Flood			
	Others			

Thank You.