PAN AFRICAN INSTITUTE FOR DEVELOPMENT – WEST AFRICA
P.O. BOX 133, BUEA, CAMEROON

DEPARTMENT OF BUSINESS STUDIES

A STUDY OF HOW AGRICULTURAL TECHNOLOGY AFFECTS ORGANIZATIONAL PERFORMANCE, CASE STUDY: TIKO BANANA PROJECT, SOUTH WEST REGION OF CAMEROON

A Project Report submitted to the Department of Business Studies, in Partial Fulfillment of the Requirements for the Award of a Graduate Diploma in Human Resource Management

By

Pembema Blandine-Arestide
PAIDWA00405

Supervisor
Dr. J.S.T. Abbosey

BUEA, JUNE 2015

RESEARCH PROJECT FINAL SUBMISSION FORM

This is to confirm that I have formally submitted my research project titled *"A Study of How Agricultural Technology Affects Organizational Performance, Case Study: Tiko Banana Project, South West Region Of Cameroon"* to the Pan African Institute for Development – West Africa (PAID-WA) as an original research report for the award of the ***Graduate Diploma in Human Resource Management (HRD) this 25th Day of June 2015***.

To the best of my knowledge, this research project has neither infringed upon anyone's copyright nor violated any proprietary rights. The ideas, techniques, quotations, and other materials obtained from other scholarly works included in my thesis, published or otherwise, are fully acknowledged. I declare also that this research project has not been submitted for a degree to any other University or Institution of Higher Learning.

I agree that information and findings contained in this research project – in the form of statements, graphics, and equations or otherwise - shall remain the property of PAID-WA. PAID-WA further retains the exclusive right to publish or disseminate it in all languages, and publications arising from this thesis.

Name of Student Submitting Thesis:	PEMBEMA BLANDINE-ARESTIDE
Matriculation Number of Student:	PAIDWA00405
Title of the Thesis:	A Study of How Agricultural Technology Affects Organizational Performance, Case Study: Tiko Banana Project, South West Region of Cameroon
Degree/Certificate in View:	Human Resource Management (HRD)
Date of Submission:	25th June 2015

Signature of Student Submitting Research Project: .....

PAN AFRICAN INSTITUTE INSTITUT PAN AFRICAIN POUR LE DEVELOPPEMENT FOR DEVELOPMENT PAID/WA P.O. BOX 133 BUEA

CERTIFICATION

This is to certify that this work: "A Study of How Agricultural Technology Affects Organisational Performance, Case Study: Tiko Banana Project, South West Region of Cameroon" is the original work of Pembema Blandine-Arestide PAIDWA 00405, Department of Human Resource Management of the Pan African Institute for Development West Africa.

Pembema Blandine-Arestide Signature: ..... Date:JUNE 2015
PAIDWA 00405

DECLARATION

I certify that I am the sole author of this research project titled A Study of How Agricultural Technology Affects Organizational Performance, Case Study: Tiko Banana Project, South West Region of Cameroon, which has been done under the supervision of my thesis supervisor and that no part of it has been published or submitted for publication.

I certify that to the best of my knowledge, this work does not infringe on anyone's copyright or violate any proprietary rights and that any ideas, techniques, quotation or other material herein, published or otherwise, are fully acknowledged.

I declare that this research project has not been submitted for a degree to any other university or institution of higher learning.

DEDICATION

To

My Mum

Mama Jeanne Ndonpouwouo

TABLE OF CONTENTS

CHAPTER ONE: GENERAL INTRODUCTION 1

1.0 Background of the study 1

1.1 Statement of the Problem 4

1.2 Objective of the Study 5

1.3 Research Questions 5

1.4 Scope of the Study 5

1.5 Significance of the Study 6

1.6 Organization of the study 7

1.7 Definition of terms 7

CHAPTER TWO: LITERATURE REVIEW 9

2.1 Theoretical framework 9-11

2.2 Conceptual review 12-16

CHAPTER THREE: METHODOLOGY OF THE STUDY 16

3.1 Research design 16

3.2 Population of the study 16

3.3 Instruments used for data collection 16

3.4 Validation of instruments 16

3.5 Administration of the instrument 16

3.6 Analytical Approach 17

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF DATA 18

4.1 Demographic data 19-20

4.2 Presentation of Results of the study 20-24

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS ..... **Error! Bookmark not defined.**

5.1 Conclusion 25-26

5.2 Recommendations……..26-27

5.3 Limitations……27-28

5.4 Suggestions for Further Research……..28

List of Tables

Table 2.1 The Three level Framework 18

Table 4.1.1 Gender of respondents 18

Table 4.1.2 Description of sample by Age 18

Table 4.2 Research question 1.....20-21

Table 4.2.1 Research question 2 22

Table 4.2.2 Research question 23-24

ACKNOWLEDGEMENTS

I am grateful to my research supervisor, Dr. J.S.T. Abbosey, who put in much time and provided helpful direction for this project.

I thank all my lecturers who taught me during my studies, particularly those in the area of Human Resource Management, as well as all authors from whose work I drew references which served as valuable sources of information for this study.

Special thanks also goes to all the administrative staff and students of PAID-WA, Buea, as well as staff of Cameroon Development Corporation (CDC), specifically on the Tiko Banana project, for their time, efforts and participation in this study.

I am grateful to my family members; Emmanuel, Faith, Harry-Destin and Claude, for their support and encouragement. I also recognize the support of friends like Miriam, Emilian, Becky, Marinette, Roland, Smith and Marievonn.

Finally, Akom Delbert deserves mention for his useful contributions and sleepless nights helping with this project.

ABSTRACT

This study examines How Agricultural Technology Affects Organizational Performance, case study: Tiko Banana Project, South West Region of Cameroon. The study population consisted of 812 workers of the Tiko Banana project with a sample population of 200 workers. The research design was a case study and data collection instrument was interviews and focus group discussions made up of 5 items, all arranged in accordance with the three objectives or research questions, which are: What are the different forms of agricultural technology used in the organization? Have the different forms of agricultural technologies used improved productivity in the organization? Are there any challenges faced with the technologies and are they adequate or not? Data collected from the field was analyzed using simple percentages and presented in table form. From the findings, different forms of agricultural technology were seen to be used like tractors and airplanes, productivity increased to an extremely high level due to use of agricultural technology and challenges are faced in using the machines like untrained technicians, unskilled operators, poor weather and redundancy amongst others . At the end, conclusions were drawn thus: Different forms of agricultural technology like tractors, bulldozers, airplanes, automatic water pumps and trolleys are used in the company. The different forms of agricultural technologies used improve productivity in the organization in an extremely high rate. There are challenges faced with the technology that is used such as unskilled labour to manipulate the machinery, untrained workers to do repairs and maintenance works, insufficient funds to replace obsolete machines amongst others. The following recommendations were made: train workers on how to operate the machines, train more technicians and engineers who can carry out repairs and maintenance works and transfer or give new tasks to workers whose areas of work have been replaced by machines to avoid boredom and redundancy.

CHAPTER ONE
GENERAL INTRODUCTION

1.0 Background of the study

We live in a highly sophisticated world where everything is almost achievable. There would probably have been no changes between the world of today and that of three centuries ago if necessity and discoveries had not driven men to achieve great things. Science and technology have had huge positive effects on every society. The world today has gone digital. Our world and every facet of it have been made easier than it was centuries ago thanks to technology. Technology has introduced considerable changes in almost all walks of life. Yet the journey of innovations and development by technology is not over. This is a fact that technology is an endless stream of possibilities which cannot be summed up in a book or in an article. It is an acknowledged truth that technology has dramatically changed the world and we can guess the coming times will introduce many new things.

Stiegler (1998), in *Techniques and Time,* defines technology in two ways: as "the pursuit of life by means other than life", and as "organized inorganic matter." According to (Arthur, 2009), technology in a similarly broad way, "a means to fulfil a human purpose." With the recent changes in technology over the years which has led to what is now known as modern technology as per the 21st century, there has been widespread effects across the world.

One of the highly felt effects of technology is that which affects agriculture. By indication, the technology that is used in agriculture differs from that which is used in other areas, like automobile construction and urban development. This means that introduction of technology in agriculture affects productivity in agricultural organizations.

According to Hurst and Douglas, (1991), agricultural technology refers to the technology used in the manufacturing of machines to be used on the farm to enhance the productivity of agricultural processes. Agricultural machines have been designed for practically every stage of the agricultural process. They include machines for tilling the soil, planting seeds, irrigating the land, cultivating crops, protecting them from pests and weeds, harvesting, threshing grain, livestock feeding, and sorting and packaging the products. People who are trained to design agricultural machinery, equipment, and structures are known as agricultural engineers. Hurst and Douglas, (1991).

In addition, Schwieder, (1996), opines that throughout history, scientific and technological advances have greatly impacted the agriculture industry. Early farmers improved their crop production by inventing the first hoes while today, farmers improve crop production through the use of global positioning systems.

According to *The Iowa Heritage*, (1996), early advances were shared by word of mouth. As new ideas were tried out and applied to growing crops and livestock, they were shared and passed to the next generation as parents taught their children. Neighbouring tribes exchanged ideas with one another and with new settlers. In recent times, scientists studying at universities devoted their lives to research and development of farming products and practices. Iowa farmers and agricultural scientists have benefited and contributed to the ever-evolving science of agriculture.

Moreover, Harry and Solie (2007), attests that agricultural technology is among the most revolutionary and impactful areas of modern technology, driven by the fundamental need for food and feeding of an ever-growing population. It has opened an era in which powered machinery does the work formerly performed by people (manually) and animals (such as oxen and horses). These machines have massively increased farm output and drastically changed the nature of people's employment and food production worldwide. A well-known example of agricultural machinery is the tractor. Currently, mechanized agriculture also involves the use of airplanes and helicopters on the fields.

Also, Schultz, (1964) argues that, the first people to turn from the hunting and gathering lifestyle to farming probably relied on their bare hands, perhaps aided by sticks and stones. Once tools such as knives and scythes were developed, they dominated agriculture for thousands of years. During this time, most people worked in agriculture, because each family could barely raise enough food for their basic subsistence with the limited technology of the day. He added that, with the coming of the Industrial Revolution and the development of more complicated machines, farming methods took a great leap forward. Instead of harvesting grain by hand with a sharp blade, wheeled machines cut a continuous swath. Instead of threshing the grain by beating it with sticks, threshing machines separated the seeds from the heads and stalks.

These machines required a lot of power, which was originally supplied by horses or other domesticated animals. With the invention of steam power came the steam-powered tractor, a multipurpose, mobile energy source that was the ground-crawling cousin of the steam locomotive. Agricultural steam engines took over the heavy pulling work of horses. They were also equipped with a pulley that could power stationary machines through the use of a long belt. The steam-powered behemoths could provide a tremendous amount of power, because of both their size and their low gear ratios. Schultz, (1964)

More so, Cochrane (1979), confirmed that, the next generation of tractors was powered by gasoline (and later) diesel engines. These engines also contributed to the development of the self-propelled, combined harvester and thresher-or combine, for short. Instead of cutting the grain stalks and transporting them to a stationary threshing machine, these combines could cut, thresh, and separate the grain while moving continuously through the field.

One of the areas of agriculture that has benefitted from agricultural technology is plantation agriculture. According to Pantin, Denis and Dhanyshar, (1998), plantation agriculture is large scale farming that requires much labor in other to carry out the production process from bulldozing, tilling, planting, application of chemicals, harvesting, treatment and packaging of the final product. For all this to be achieved there is need to implore the use of machinery that will effectively and efficiently carry out the required tasks at a higher speed and at a faster rate.

Even though agricultural technology is highly rooted in America, Europe and Asia, Africa stands out as one of the highest beneficiaries of technology. Cameroon as part of Africa therefore has shared in the impact of technology from across the oceans, particularly the economic sector with emphasis on the productive sector. This is the case with the Tiko Banana Project, South West Region Cameroon which was founded many years ago under the Cameroon Development Corporation (CDC) by the Germany colonial masters.

Background of the Study Area: **Tiko Banana Project, South West Region Cameroon**

Tiko Banana Project of the Cameroon Development Corporation (CDC)/Del Monte whose headquarters is based in Tiko Sub-Division South West Region of Cameroon, was established

in 1987. This was after a partnership agreement and signing of an accord between CDC and an American agro-industrial company interested in banana production known as Del Monte. The name Del Monte was adopted after the partnership agreement. The partnership between these two companies started with a ten years renewable contract that is from 1987 to 1997 and renewed from 1997 to 2007. Thereafter, from 2007 this "ten years" contract was reduced to two years contract, which continued up to 2009.

In this partnership agreement, the factors of production, namely land, capital, labor and entrepreneur, were to be provided by CDC while Del Monte provided the technical services, marketing facilities and finance. The government of Cameroon also supported this project with the donation of land worth 3,000 hectares to CDC for the commencement of the agricultural industry. It is important to note that Del Monte paid CDC cost plus a fixed margin per box of banana exported. Effective operations by Del Monte Tiko started in 1990.

The firm is very elaborate and it is headed by a Managing Director (MD) who is answerable to the General Manager of CDC. The firm is made up of six basic departments namely the technical department headed by a Project Engineer (PE), the Personnel/Administrative department headed by Project Administrative Officer (PRO), the finance department headed by the Project Accountant (PA), the Production department headed by a Production Manager and finally the medical section headed by a Medical Doctor. All these departments are supervised by the project manager who is answerable to the Managing Director (MD) who is assisted by Field supervisors sometimes referred to as "headman".

Taking into consideration the recent trends and evolution in agricultural technology as outlined above, this study seeks to investigate how agricultural technology affects organizational performance in the Tiko Banana Project South West Region Cameroon.

1.1 Statement of the Problem

As far back as the 19th century; the world changed its economic status from an agrarian to an industrialized one. This was necessitated by the tremendous increase in the world's population. Since then, economic organizations have improved in their production of goods and services and the evolution has now reached greater heights with the present increase in the demand for goods and services due to the ever increasing population, but surprisingly low supply. According to Ursula (1989), productivity can only grow if modern technology is fully

implemented in organizations. With the present innovations and discoveries in agricultural technology, whose outcome has been the production of huge machinery which have been invested in agriculture, the research is focused on investigating various ways through which agricultural technology affects the performance of organizations with a view of proposing solutions.

1.2 Objectives of the Study

The main objective of this research is to examine how agricultural technology affects the performance of employees in the organizations, with specific reference to the Tiko Banana Project, South West Region Cameroon.

Specifically, this research aims to:

- Examine the various forms of agricultural technology used in the Tiko Banana Project, South West Region Cameroon.
- Assess the impact of agricultural technology on productivity in the organization.
- Find out if there are any challenges faced with using the agricultural technology that is whether they are adequate or not.
- Propose some policy recommendations.

1.3 Research Questions

Main research question

Does agricultural technology affect the performance of the organization?

The study seeks to address the following questions to the Tiko Banana Project:

1. What are the different forms of technology used in the Tiko Banana Project?
2. Have the different forms of agricultural technologies used improved productivity in the organization?
3. Are there any challenges faced with the technology that is, are they adequate or not?

1.4 The scope of the study

This study was delimited to the Tiko Banana Project, South West Region of Cameroon.

1.5 Significance of the Study

1. Management

- This research will enable organizations to minimize costs, meet up with buying of raw materials ‘fast productions by modern machines and easy supply of goods to various destinations by the use of modern vans/trucks.
- This study will equally inform management of the necessity of technology in the production process specifically the fact that it leads to fast production. As such time will be minimized and resources fully utilized.
- Again, the introduction of mechanized farm equipment like tractors and airplanes in the production chain especially cultivation will lead to increase yields.

3.To government

- Organizations that deal with agriculture play a vital role in the economic sector of any nation in terms of revenue generation through taxes as such, this research will inform government of the impact of increase productivity by large scale farming due to use of agricultural technology.
- Furthermore it is worth noting that banana is a cash crop that is in high demand in the foreign market especially in Europe and America as such increase production from the use of technology will lead to increase in export of produce which will bring in foreign exchange earnings and investors to the country. This will certainly boost the economy of the nation.

3. To Employees

- This piece of work will reveal how agricultural technology can reduce stress and fatigue on employees by using machines controlled by computers for production of goods. Thus fast production of goods and increase in the quantity of goods produced as well as increase output from employees meeting up with demands and safeguarding the health of workers as such the overall performance of organizations changes positively.

4. To consumers:

- This study will inform consumers about the effects of the use of machinery that is the fact that goods will be readily available in large quantities and at a faster rate to meet up with their demands.

1.6 Organization of the study

Chapter one presents an analysis of the background of the study, a statement of problem, objectives of the study, research questions that guide the study, scope and the significance of the study. Chapter two examines the related literature in explicit terms, making reference to theories to support the study as well as conceptual review, to share what others scholars have written on the subject matter. As a result, missing links and gaps will be identified and contributions made with data collected from the field. Chapter three discusses the methodology used in conducting the research. It examines the research design used for the study, the population, sample size, instruments used for data collection, validity of the instruments as well as techniques used for data analysis. Chapter four presents and analyzes the major findings obtained from the field with emphasis on answering the main research questions raised at the beginning. Chapter five summarizes the main findings and draws conclusions from where recommendations are made and proposals for further research are made.

1.7 Definition of Terms

According to (Hurst and Douglas 1991), agricultural technology refers to technology for the production of machines used on a farm to help with farming. Agricultural machines have been designed for practically every stage of the agricultural process. They include machines for tilling the soil, planting seeds, irrigating the land, cultivating crops, protecting them from pests and weeds, harvesting, threshing grain, livestock feeding, and sorting and packaging the products. People who are trained to design agricultural machinery, equipment, and structures are known as agricultural engineers.

According to Stiegler, (1998), in *Techniques and Time,* defines technology in two ways: as "the pursuit of life by means other than life", and as "organized inorganic matter.

According to Upadhaya & Blount, (2014), organizational performance is an analysis of a company's performance as compared to goals and objectives. Within corporate organizations, there are three primary outcomes analyzed: financial performance, market performance and shareholder value performance (in some cases, production capacity performance may be analyzed).

CHAPTER TWO
LITERATURE REVIEW

This chapter focuses on what other researchers and intellectuals have documented which is in line with the topic of this research.

2.1 Theoretical framework

Theory of Generation of Innovation-Induced Innovations

This theory was introduced by Olmstead, Alan and Rhode**, (1993).** It states that, there are several stages in the generation of innovations. The first stage is discovery, which is characterized by the emergence of a concept or results on which the innovation is established. A second essential stage is development, where the discovery moves from the laboratory to the field, and is scaled up, commercialized, and integrated with other elements of the production process. In cases of patentable innovations, between the time of discovery and development, there may also be a stage where there is registration for a patent. If the innovation is embodied, once it is developed it has to be produced and, finally, marketed. For embodied innovations, the marketing stage consists of education, demonstration, and sales. Only then does adoption occur.

Some may hold the notion that new discoveries are the result of inspiration occurring randomly without a strong link to physical reality. While that may sometimes be the case, Hayami and Ruttan, (1985) formalized and empirically verified their theory of induced innovations that closely linked the emergence of innovations with economic conditions. They argued that the search for new innovations is an economic activity that is significantly affected by economic conditions. New innovations are more likely to emerge in response to scarcity and economic opportunities. For example, labor shortages will induce labor-saving technologies. Environmental-friendly techniques are likely to be linked to the imposition of strict environmental regulations. Drip irrigation and other water-saving technologies are often developed in locations where water constraints are binding, such as Israel and the California desert. Similarly, food shortages or high prices of agricultural commodities will likely lead to the introduction of a new high-yield variety, and perceived changes in consumer preferences may provide the background for new innovations that modify product quality.

The work of Boserup (1965) and Binswanger and McIntire (1987), on the evolution of agricultural systems support the induced-innovation hypothesis. Early human groups,

consisting of a relatively small number of members who could roam large areas of land, were hunters and gatherers. An increase in population led to the evolution of agricultural systems. In tropical regions where population density was still relatively small, farmers relied on slash and burn systems. The transition to more intensive farming systems that used crop rotation and fertilization occurred as population density increased even further. The need to overcome diseases and to improve yields led to the development of innovations in pest control and breeding, and the evolution of the agricultural systems we are familiar with.

According to Berck and Perloff, (1985), the same phenomena may occur with seafood. An increased demand for fish and expanded harvesting may lead to the depletion of population and a rise in harvesting costs, and thus trigger economic incentives to develop alternative aquaculture for the provision of seafood.

While scarcity and economic opportunities represent potential demand that is, in most cases, necessary for the emergence of new innovations, a potential demand is not sufficient for inducing innovations. In addition to demand, the emergence of new innovations requires technical feasibility and new scientific knowledge that will provide the technical base for the new technology. Thus, in many cases, breakthrough knowledge gives rise to new technologies. Finally, the potential demand and the appropriate knowledge base are integrated with the right institutional setup, and together they provide the background for innovation activities. These ideas can be demonstrated by an overview of some of the major waves of innovations that have affected U.S. agriculture in the last 150 years. Berck and Perloff, (1985).

New innovations currently are linked with discoveries of scientists in universities or firms. However, in the past, practitioners were responsible for most breakthroughs. Over the years, the role of research labs in producing new innovations has drastically increased, but field experience is still very important in inspiring innovations. John Deere, who invented the steel plough, was a farmer. This innovation was one of a series of mechanical innovations that were of crucial importance to the westward expansion of U.S. agriculture in the nineteenth century. At the time, the United States had vast tracts of land and a scarcity of people; this situation induced a wide variety of labor-saving innovations such as the thresher, several types of mechanical harvesters, and later the tractor.

An Essay on the Principle of Population

Malthus 1798 being the proponent of this theory, he was particularly interested in everything about populations. He accumulated figures on births, deaths, age of marriage, childbearing and economic factors contributing to longevity. His main contribution was to highlight the relationship between food supply and population. Humans do not overpopulate to the point of starvation, he contended, only *because* people change their behavior in the face of economic incentives.

Noting that while food production tends to increase arithmetically, the population increased naturally at a (faster) geometric rate. Malthus argued that it is no surprise that people thus *choose* to reduce (or "check") population growth. People can increase food production, only by slow, difficult methods such as reclaiming unused land or intensive farming; but they can check population growth more effectively by marrying late, using contraceptives, emigrating, or, in more extreme circumstances, resorting to reduced health care, tolerating vicious social diseases or impoverished living conditions, warfare, or even infanticide. Malthus was fascinated not with the inevitability of human demise, but with why humans do *not* die off in the face of such overwhelming odds. As an economist, he studied responses to incentives. Malthus (1798)

Malthus is arguably the most misunderstood and misrepresented economist of all time. The adjective "Malthusian" is used today to describe a pessimistic prediction of the lock-step demise of a humanity doomed to starvation due to overpopulation. When his hypothesis was first stated in his best-selling: *An Essay on the Principle of Population* (1798), the uproar it caused among non economists overshadowed the instant respect it inspired among his fellow economists. So irrefutable and simple was his illustrative side-by-side comparison of arithmetic and a geometric series - food increases more slowly than population - that it was often taken out of context and highlighted as his main observation. The observation is, indeed, so stark that it is still easy to lose sight of Malthus's actual conclusion: that because humans have *not* all starved, economic choices must be at work, and it is the job of an economist to study those choices. Malthus, (1798)

2.2 Conceptual Review

Here the researcher examines statements and ideas propounded by other intellectuals on the impact of agricultural technology on organizational performance. These concepts will be reviewed under the various variables of the study as listed above.

According to Harry and Solie, (2007), contend that, agricultural technology is among the most revolutionary and impactful areas of modern technology, driven by the fundamental need for food and for feeding an ever-growing population. It has opened an era in which powered machinery does the work formerly performed by people (manually) and animals (such as oxen and horses). These machines have massively increased farm output and drastically changed the way people are employed and produce food worldwide. A well-known example of agricultural machinery is the tractor. Currently, mechanized agriculture also involves the use of airplanes and helicopters on the fields.

Moreover, the Britannica Online (2014) notes that, with the coming of the Industrial Revolution and the development of more complicated machines, farming methods took a great leap forward. Instead of harvesting grain by hand with a sharp blade, wheeled machines cut a continuous line or row. And instead of threshing the grain by beating it with sticks, threshing machines separated the seeds from the heads and stalks.

In addition, steam power internal combustion engines were discovered and used to improve production in industries. First the petrol (Otto) engine and later diesel engines, became the main sources of power for the next generation of tractors. These engines also contributed to the development of the self-propelled, combined harvester and thresher, or combine harvester. Instead of cutting the grain stalks and transporting them to a stationary threshing machine, these combines cut, threshed, and separated the grain while moving continuously through the field. Britannica Online, (2014)

Today, tractors still do the majority of work on a modern farm. They are used to pull machines that till the ground, plant seeds, and harvest and perform other tasks. Some specially designed tractors prepare the soil for planting by loosening the soil and killing weeds or competing plants. The best-known is the plough, which was upgraded in 1838 by John Deere. Ploughs are often used in combination with offset disks to turn over the soil, while chisels are used to gain the depth needed to retain moisture. Britannica Online, (2014)

In addition, planters help in spacing seeds out equally in long rows, which are usually two to three feet apart. Some crops are planted by drills, which put out much more seed in rows less than a foot apart, blanketing the field with crops. Transplanters and seeders lay down long

rows and plant through them automatically. After planting, other implements can be used to cultivate weeds from between rows, or to spread fertilizer and pesticides. Britannica Online, (2014)

Equally, Britannica Online , (2014), attests that, modern irrigation relies on machinery, engines, pumps and other specialized gear provide water quickly and in high volumes to large areas of land. Similar types of equipment can be used to deliver fertilizers and pesticides. Besides the tractor, other vehicles have been adapted for use in farming, including trucks, airplanes, and helicopters, such as for transporting crops and making equipment mobile, to aerial spraying. Also, power for agricultural machinery was originally supplied by ox or other domesticated animals. With the invention of steam power, came the portable engine, and later the traction engine, a multipurpose, mobile energy source that was the ground-crawling "cousin" to the steam locomotive. Agricultural steam engines have taken over the heavy pulling work of oxen, and are also equipped with a pulley that can power stationary machines through the use of a long belt.

According to Schultz, (1964) and Cochrane (1979), technological change has been a major factor shaping agriculture in the last 100 years. A comparison of agricultural production patterns in the world at the beginning of 1920 and end of the century 1995 shows that, harvested cropland has declined (from 350 to 320 million acres), the share of the agricultural labor force has decreased substantially (from 26 to 2.6 percent), and the number of people now employed in agriculture has declined (9.5 million in 1920 vs. 3.3million in 1995); yet agricultural production in 1995 was 3.3 times greater than in 1920, United States Bureau of the Census, (1975, 1980, 1998).

As noted by Brown, Gardner, and Halweil, (1999), internationally, tremendous changes in production patterns have occurred. While world population doubled between 1950 and 1998 (from 2.6 to 5.9 billion), grain production per person also increased to about 12 percent, and harvested acreage per person has declined by half. These figures suggest that productivity has increased and agricultural production methods have changed significantly.

According to Cochrane, (1979), in the 19th century, most of the emphasis was on mechanical innovation. He noted that yield per acre did not change much during the nineteenth century, but the production of United States (US) agriculture expanded drastically as the land base expanded.

However, Olmstead, Alan and Rhode, (1993), suggest that even during that period, there was heavy emphasis on biological innovation. Throughout the settlement period, farmers and scientists, who were part of research organizations such as the Agricultural Research Service (ARS) of the United States, Department of Agriculture (USDA), and the experiment stations at the land-grant universities in the United States, experimented with new breeds, both domestic and imported, and developed new varieties that were compatible with the agro-climatic conditions of the newly settled regions. These efforts maintained per-acre yields.

According to Olmstead, Alan and Rhode, (1993), once most of the arable agricultural land of the continental United States was settled, expansion of agricultural production was feasible mostly through increases in yields per acre. The recognition of this reality and the basic breakthrough in genetics research in the nineteenth century increased support for research institutions in their efforts to generate yield-increasing innovations. Most of the developed countries established agricultural research institutions. After World War II, a network of international research centers was established to provide agricultural innovations for developing countries. The establishment of these institutions reflected the recognition that innovations are products of research and discoveries activities, and that the magnitude of these activities is affected by economic incentives.

Rhode (1993) reveals that technological innovation and institutional change have a profound effect on the evolution of the agricultural sector. The agricultural economic literature on innovation and early documents reveals that innovations do not occur randomly, but rather that incentives and government policies affect the nature and the rate of innovation and adoption. Both the generation of new technologies and their adoption are affected by intentional public policies (e.g., funding of research and extension activities), unintended policies (e.g., manipulation of commodity prices), and activities of the private sector. One of the challenges of designing technology policies in agriculture is to obtain an optimal mix of public and private efforts. Design of these policies will require improved understanding of the economics of complex processes of innovation, learning, and adoption in a myriad of institutional and technological settings. Economists have made many notable advances through their research on innovation and adoption, but there remains much to be discovered.
According to Upadhaya & Blount, (2014), organizational performance is an analysis of a company's performance as compared to goals and objectives. Within corporate organizations, there are three primary outcomes analyzed: financial performance, market performance and

shareholder value performance (in some cases, production capacity performance may be analyzed).

Specialists in many fields are concerned with organizational performance including strategic planners, operations, finance, legal, and organizational development. In recent years, many organizations have attempted to measure organizational performance using the balanced scorecard methodology where performance is tracked and measured in multiple dimensions such as:

- Financial performance (e.g. shareholder return)
- Customer service
- Social responsibility (e.g. corporate citizenship, community outreach)
- Employee stewardship.

According to Upadhaya and Blount, (2014), organizational performance is an analysis of a company's performance as compared to goals and objectives. Within corporate organizations, there are three primary outcomes analyzed: financial performance, market performance and shareholder value performance (in some cases, production capacity performance may be analyzed).

Rummler and Brache, (1990), the organization is part of an economic system. It responds to the marketplace, competition, fluctuating resources, etc. The survival of the organization depends upon its ability to adapt to the demands of this external system. Thus necessitating the design of an overview of the Three Level Framework, used to improve the performance of an organization.

Table 2.1: The Three level Framework

PI	Goals	Design	Management
Organization Level	Organization Goals	Organization Design	Organization Management
Process Level	Process Goals	Process Design	Process Management
Job/Performer Level	Job Goals	Job Design	Job Management

Source: Rummler and Brache, (1990): The three level framework.

Organizations are divided into three levels; Organizational, Process, and Job or Performer. At each level, you need to define goals and measures, indicate what is to be done (design), and determine what level of management is responsible for making sure the changes take place.

CHAPTER THREE
METHODOLOGY OF THE STUDY

This chapter describes the methods and procedures used in carrying out the study, under the following sub-headings;

3.1 Research design

The case study research design was considered suitable for the study because it is descriptive and gives a detailed account based on field work and considering the fact that the researcher could not have investigated all the organizations in Cameroon. Therefore, the case study design was considered most suitable for the study.

3.2 Population of the study

The research focused on workers of the Tiko Banana Project. The sample size of the study was 812 and the sample consisted of 200 workers. This sample size has been chosen because it is a representative sample for the entire population under study.

3.3 Instruments used for data collection

In order to assemble data for the study, the quantitative research method was used. Interview guide was prepared and administered to the sample population in order to collect demographic data as well as specific data relating to the topic under investigation.

3.4 Validation of instruments

The researcher drafted the main research instrument; which was submitted to the supervisor for appraisal. He then conducted the face and content validity and after realizing that the questionnaire was not well structured and that some items will not contribute to knowledge and serve the purpose of the study, the questionnaire was redesigned to suite the task for the collection of vital data that will contribute to knowledge and serve the purpose of the research. Therefore this questionnaire was validated before being administered.

3.5 Administration of the instrument

Before administering the questionnaires, the researcher obtained a letter of introduction from the school to testify that she was actually student from the school on research. This letter was intended to help the researcher gain access to the area of research that is the Tiko Banana

Project of the South West Region Cameroon. The researcher personally administered the questionnaires in order to save time and clarify doubts where necessary.

3.6 Analytical Approach

The percentage score will be used to analyze the data. Data will be calculated by use of simple percentages and will be further presented on frequency tables. This will make it possible for the researcher to compare the responses in order to draw valid conclusions.

CHAPTER FOUR
PRESENTATION AND ANALYSIS OF DATA

This chapter presents data analysis and findings of the study. The results will be analyzed using simple percentages and frequency distribution tables. The analysis will cover the variables being tested for the study to include demographic data, different forms of agricultural technology used, assess whether they have improved on productivity and the challenges faced in using the agricultural technologies.

Furthermore, data will also be analyzed and presented in order to meet the objectives of the study.

4.1 Demographic data

Table 4.1.1 Gender of respondents

Gender	Male	Female	Total
Number	130	70	200
Percentage	65	35	200

Table 4.1 above reveals that there were a total of 200 respondents who serve as the sampled, with 130 of them being males and 70 females giving 65 and 35 percentages respectively. The figures reveal that most of the field workers at the Tiko Banana Project, South West Region of Cameroon are males. The researcher observed that females occupy more of office positions. The female participants of the study were actually selected in order to avoid any form of pure gender bias.

Table 4.1.2 Description of sample by Age.

Age group	Frequency	Percentage
26-35	98	49
36-45	67	35.5
46-55	35	17.5
Total	200	200%

The data in table 4.2 shows that 98 (49%) of the 200 respondents were within the ages of 26-35, 67 were between 36-45 (35.5%) and 35 of them between 46-55 (17.5%). From the statistics a majority of the workers in the plantation are youths amounting to 49% of total respondents. This indicates that youths have either abandoned school or do not have enough financial means to continue school as such they engage in plantation agriculture. This also reveals that the plantation has a strong work force. The last age group from 46-55years constituted only 17.5% of the sample size. This indicates that the ageing population is not fully present in the plantation for field work. Also, the researcher realized that as the workers grow old, they tend to occupy higher positions of responsibility.

4.2 Presentation of results of the study

1. **Research Question 1.** What are the different forms of technology used in the Tiko Banana Project?

Table 4.2 Responses to research Question 1

Forms of agricultural technology and Equipment used	Frequency	Cumulative frequency	Percentage
Tractors	11	11	5.5
Bulldozers	10	21	5
Airplanes	6	27	3
Trolleys	4	31	2
Automatic water pumps	9	40	4.5
All of the above	160	200	80
Total	200	200	100%

The data on table 4.2 above reveals that tractors 5.5%, bulldozers 5%, Airplanes 3% , Trolleys 2% and automatic water pumps 4.5% are the agricultural technologies used in the plantation. On the same note 169 of the total respondents amounting to 84.5% indicated that all the above mentioned equipment like tractors, bulldozers, airplanes and trolleys put together make up the agricultural equipment used in the Tiko Banana Project of the Southwest region of Cameroon.

To justify the above responses, the respondents added that tractors and bulldozers play a vital role because they till and plough vast hectares of land within a few hours and assist in planting while the airplanes and automatic water pumps supply water and chemicals even faster for the care and growth of the crops. They added that once harvested the bananas are easily packed in large quantities thanks to trolleys.

This can be tied with Harry and Solie, (2007), who ascertain that a well-known example of agricultural machinery is the tractor. Currently, mechanized agriculture also involves the use of airplanes and helicopters on the fields.

To add, Britannica Online, (2014), posits that Agricultural steam engines have taken over the heavy pulling work of oxen, and are also equipped with a pulley that can power stationary machines via the use of a long belt." Besides the tractor, other vehicles have been adapted for use in farming, including trucks, airplanes, and helicopters, such as for transporting crops and making equipment mobile, to aerial spraying.

This is again supported by This can be tied with what is recorded in Agricultural Engineering, Britannica Online,(2014) which indicates that "with the coming of the Industrial Revolution and the development of more complicated machines, farming methods took a great leap forward. Instead of harvesting grain by hand with a sharp blade, wheeled machines cut a continuous line or row. Instead of threshing the grain by beating it with sticks, threshing machines separated the seeds from the heads and stalks. The first tractors appeared in the late 19th century" Also this is confirmed by Britannica Online, "Power for agricultural machinery was originally supplied by ox or other domesticated animals. With the invention of steam power came the portable engine, and later the traction engine, a multipurpose, mobile energy source that was the ground-crawling cousin to the steam locomotive.

2. **Research Question 2.** Have the different forms of agricultural technologies used improved productivity in the organization?

Table 4.2.1 Responses to research question 2

Rate of change or improvement	Frequency	Cumulative frequency	Percentage
Low	2	2	1
Extremely low	0	2	0
Constant	0	2	0
High	62	64	31
Extremely high	136	200	68
Total	200	200	100%

According to the data on the above table, only 2 respondents indicated that productivity was low as a result of the use of agricultural technology while none of them either said productivity was extremely low or constant when agricultural technology was used.

Contrary to this 62 (31%) out of the 200 revealed that productivity was high due to the application of agricultural machinery. To add, 136 (68%) of the 200 admitted that productivity had increased to an extremely high level all because of agricultural technology like tractors, bulldozers, airplanes and water pumps. However due to reasons beyond the comprehension of the investigator, the respondents were very reluctant to give any clues as to the numbers regarding increase in productivity but just affirmed that there were increases and growth in productivity.

This is in line with Harry and Solie, (2007), who ascertain that these machines have massively increased farm output and drastically changed the way people are employed and produce food worldwide. He also contend that, agricultural technology is among the most revolutionary and impactful areas of modern technology, driven by the fundamental need for food and for feeding an ever-growing population. It has opened an era in which powered machinery does the work formerly performed by people (manually) and animals (such as oxen and horses).

This is again boosted by Schultz, (1964) and Cochrane (1979), who propound that technological change has been a major factor shaping agriculture in the last 100 years. A comparison of agricultural production patterns in the world at the beginning of 1920 and end of the century 1995 shows that, harvested cropland has declined (from 350 to 320 million

acres), the share of the agricultural labor force has decreased substantially (from 26 to 2.6 percent), and the number of people now employed in agriculture has declined (9.5 million in 1920 vs. 3.3million in 1995); yet agricultural production in 1995 was 3.3 times greater than in 1920, United States Bureau of the Census, (1975, 1980, 1998).

As noted by Brown, Gardner, and Halweil, (1999), internationally, tremendous changes in production patterns have occurred. While world population doubled between 1950 and 1998 (from 2.6 to 5.9 billion), grain production per person also increased to about 12 percent, and harvested acreage per person has declined by half. These figures suggest that productivity has increased and agricultural production methods have changed significantly.

3. **Research Question 3.** Are there any challenges faced with the technology that is, are they adequate or not?

Table 4.2.2 Responses to research question 3

Challenges	**Frequency**	**Cumulative frequency**	**Percentage**
Unskilled labourers to manipulate equipment	5	5	2.5
Untrained technicians for repairs and maintenance	4	9	2
Insufficient funds for replacement	8	17	4
Poor weather and topography	3	20	1.5
Resistance to change	2	22	1
Insufficient machinery to complete task	5	27	2.5
Idleness, boredom and redundancy-joblessness	4	31	2
All of the above	169	200	84.5
Total	200	200	100%

From the table, 5 respondents admitted that they were unskilled to manipulate the machinery, 4 said they were untrained to do repairs and maintenance works, 8 talked of insufficient funds to replace obsolete machines, 3 revealed that poor weather and topography perturbed proper

use of the equipment like airplanes, 2 others talked of some workers been resistant to accept the new innovations, 5 of them indicated that the available tractors and bulldozers were too small to complete all the tasks and 4 lamented that the presence of the equipment led to boredom, idleness and redundancy in most cases especially the work done by tractors. To buttress this, another majority about 169 (84.5%) fully asserted that all the above mentioned factors put together worked in unison as major challenges and obstacles that impede the effective and efficient use of the agricultural technologies listed.

Olmstead, Alan and Rhode, (1993), all affirm these challenges when they indicate that the agricultural economic literature on innovation and early documents reveals that innovations do not occur randomly, but rather that incentives and government policies affect the nature and the rate of innovation and adoption. Both the generation of new technologies and their adoption are affected by intentional public policies (e.g., funding of research and extension activities), unintended policies (e.g., manipulation of commodity prices), and activities of the private sector. One of the challenges of designing technology policies in agriculture is to obtain an optimal mix of public and private efforts. Design of these policies will require improved understanding of the economics of complex processes of innovation, learning, and adoption in a myriad of institutional and technological settings. Economists have made many notable advances through their research on innovation and adoption, but there remains much to be discovered.

CHAPTER FIVE
CONCLUSION AND RECOMMENDATIONS

This chapter seeks to draw conclusions from the findings and analysis of data obtained from the field through administration of interviews. In view of this therefore, conclusions will be based on the data already presented in tabular form in order to give it more meaning in accordance with gender of respondents and age group of respondents.

Also conclusions will be based on the objective of the study, which is to find out how Agricultural Technology Affects Organizational performance in the Tiko Banana Project. This will be discussed based on the specific objectives or research questions guiding the study.

From the conclusions tabled by the researcher, recommendations will be made, limitations stated and suggestions given for further investigation.

5.1 Conclusion

From the researcher's personal experiences, observations and from the data collected from the field through interviews that were presented to the workers, taking into consideration that the data or findings from the field were carefully analyzed through frequency distribution tables and calculated by simple percentages, mindful of the fact that the results were supported by literature review after having been presented on tables, this study found the following:

Agricultural Technology has a significant effect on the performance of organizations particularly the Tiko Banana Project, South West Region of Cameroon. Specifically, this investigation has shown that all the indicators of technology presented to respondents have a major effect on organizational performance (Tiko Banana Project, South West Region of Cameroon)

Considering that the respondents all responded positively to the research questions, all above 80% for each of the questions and with more than 180 out of the 200 acknowledging the role of each of the research objectives as influential to Organisational Performance, in the Tiko Banana Project South West Region Cameroon, the researcher therefore conclude that:

- Different forms of agricultural technology like tractors, bulldozers, airplanes, automatic water pumps and trolleys are used in the company.
- The different forms of agricultural technologies used improve productivity in the organization in an extremely high rate.
- There are challenges faced with the technology that is used such as unskilled labour to manipulate the machinery, untrained workers to do repairs and maintenance works, insufficient funds to replace obsolete machines, poor weather and topography perturbs proper use of the equipment like airplanes, workers been resistant to accept the new innovations, available tractors and bulldozers too small to complete all the tasks and the presence of the equipment leads to boredom, idleness and redundancy in most cases especially the work done by tractors.

In line with this study, the researcher concludes thus: Technology affects organizational performance in the Tiko Banana Project, but does not have 100% influence on all processes carried out in the plantation.

5.2 Recommendations

Based on the discussion of the findings and conclusions, the following recommendations are addressed to the company, management and workers.

To the Management

- In order to improve the influence of agricultural technology on organizational performance, the company should improve on their equipment and also bring in modern agricultural technology so that the productivity levels of the company can increase.
- The company should also train their workers on how to operate, handle, use or manipulate the machines especially the modern machines so that manual work will reduce and productivity will increase.
- Train more technicians and engineers who can carry our repairs and maintenance works on broken down machinery and equipment so as to avoid work from slowing down in case a machine fails to work properly.
- Seek funding from the government and other donors form within and without of the country in order to acquire new and updated machines to replace obsolete ones.

- Adopt other machinery that can be used during poor weather conditions like tractors that can spray or apply chemicals on the crops in case the airplanes have visibility problems due to poor weather.
- Transfer or give new tasks to workers whose areas of work have been replaced by machines to avoid boredom and redundancy as well as prevent skills from diminishing.

To the workers

- Workers should be willing to accept, be dynamic to any technological innovations and accept to undergo training on how to operate the new machines brought in the company.
- Workers should report any weaknesses noticed with their machines as soon as possible to hierarchy so that the problem can be addressed before it gets off hand.

To the government

- Make available funds and grants to agricultural organizations so as to permit them adopt mechanized farm inputs in order to boost not only production but also the economy of the country.

5.3 Limitations

A study of this nature could not have been carried out successfully without shortcoming and constraints. This investigation was previewed to cover the entire Tiko banana project but due to time constraints, financial constraints and feasibility reasons, this work is delimited to a section of the plantation.

Another challenge the researcher encountered was that of finance. Taking into consideration that Tiko is some distance away from Buea and the fact that the investigator also had other financial demands for school needs, this was coupled with fact that the researcher went to Tiko on several occasion without being attained to.

The researcher actually went to Tiko for one and a half week to get information and to administer the interview. The hierarchy was not also willing to give information because of fear that it might be used for different purposes other than research. As such the researcher had to dialogue with them and obtained their informed consent to participate and assured them of the unanimity and confidentiality of their responses.

Again, time factor was a major difficulty. The researcher found it difficult to carry out this study, at the same time with other school engagements like classes and internship.

Finally, the most difficult aspect of the research was to gain permission for administering the interview within the area of study as well as convincing the workers not just to answer the questions but to do so truthfully. The bureaucratic nature of most managers pushed the researcher to the head office of the Cameroon Development Corporation to ask for permission from the director and to have access to other information but the situation in the head office was not different thus another letter of application was written to the director of Tiko Banana Project before he could grant access to information and permission to administer the interviews within his area of jurisdiction.

5.4 Suggestions for Further Research

In the course of this study, the main indicators of technology indentified by the researcher and used as research questions were seen to have a major influence on their own on organizational performance. In line with this therefore, the following suggestions are being presented for further study;

- Some forms of agricultural technology used in the company and their impact on organizational performance.
- The impact of agricultural technology on the fast growth of plantation agriculture.
- How technology influences division of labour in organizations.

REFERENCES

An Essay on the Principle of Population. (1st ed. 1798), online at the Library of Economics and Liberty, http://www.econlib.org/library/Malthus/malPop.html; 6th ed. 1826, online at the Library of Economics and Liberty, http://www.econlib.org/library/Malthus/malPlong.html

Bernard, Stiegler, (1998). *Techniques and Times. Stanford*: Stanford University Press.

Binswanger, Hans P. and John McIntire. 1987. "Behavioural and Material Determinants of Production Relations in Land-abundant Tropical Agriculture." *Economic Development and Cultural Change*, Vol. 36, No. 1 (October): 73-99

Boserup, Ester. (1965). *The conditions of agricultural growth*: *The Economics of agrarian change under population pressure*. Chicago: Aldine Publishing Company.

Brian, W. Arthur. (2009). *The Nature of Technology: What It Is and How It Evolves.* The Free Press and Penguin Books.

Brown, Lester R., Gary Gardner and Brian Halweil, (1999). *Beyond Malthus. Nineteen Dimensions of the Population Challenge*, The World watch Environmental Alert Series, Linda Starke, New York: Series Editor W.W. Norton & Company.

Cochrane, Willard W., 1979, *The Development of American Agriculture*: *A Historical Analysis* .Minneapolis: University of Minnesota Press.

Harry L. and John Solie. 2007. *Introduction to Agricultural Engineering Technology: A Problem Solving Approach*. New York, NY: Springer.

Hayami and Vernon W. Ruttan, (1985*).Agricultural Development: An. International Perspective*. Baltimore: Johns Hopkins University Press.

Hurst, Douglas R. 1991. *Agricultural Technology in the Twentieth Century*. Manhattan, KS: Sunflower University Press.

https://en.wikipedia.org/wiki/Encyclopædia_Britannica_Online,2014.

Labor in the Production Process in Cameroon Development Corporation (CDC), Delmonte. *Anti Essays*. Retrieved August 5, 2015, from the World Wide Web:

http://www.antiessays.com/free-essays/Labour-In-The-Production-Process-In-369677.html

Olmstead, Alan L. and Paul Rhode, 1993, Induced innovation in American Agriculture: reconsideration, *Journal of Political Economy* 101(1), 100–118.

Pantin, Denis and Dhanyshar Mahabir, (1998). (Eds).Plantation Agriculture. *R*evisited. *Issue of Marranage, vol1, No1.*

Peter Berck and Jeffrey M. Perloff, "The Commons as a Natural Barrier to Entry: Why There Are So Few Fish Farms," *American Journal Of Agricultural Economics*, 67(2), May, 1985: 360-63.

Peter Berck and Jeffrey M. Perloff, "A Dynamic Analysis of Marketing Orders, Voting, and Welfare," *American Journal of Agricultural Economics*, 67(3), August, 1985: 487-96.

Rummler, G. & Brache, A., (1990). *Improving Performance: How to Manage the White Space on the Organization Chart.* San Francisco: Jossey-Bass.

Schultz, Theodore W., 1964, Transforming Traditional Agriculture. New Haven, CT: Yale University Press,.

Schwieder, Dorothy. *Iowa: The Middle Land*. Ames, Iowa: Iowa State Press, 1996.

The Iowa Heritage: A Guide for Teachers, (1996) Iowa Public Television, Johnston, IA.

Upadhaya, B., Munir, R., & Blount, Y. (2014). Association between Performance Measurement Systems and Organizational Effectiveness. International Journal of Operations & Production Management, 34(7), 2-2.

Ursula, M. Franklin. (1989). *The Real World of Technology*. Canada: Anansi.

www.Merriam-Webster Dictionary.org

Appendix 1

AFRICAN INSTITUTE FOR DEVELOPMENT – WEST AFRICA (PAID-WA), BUEA

INTERVIEW GUIDE

I am **PEMBEMA BLANDINE-ARESTIDE**, a final year Graduate diploma student from the Department of Human Resource Management, specializing in Human Resource Management at the Pan African Institute for Development – West Africa (PAID-WA) Buea. As part of the requirements for the completion of my programme, I am carrying out a research on the topic: **How Agricultural Technology Affects Organizational Performance Case study: Tiko Banana Project South West Region Cameroon.**

Your responses will be anonymous and will not be linked to you personally. Mind you of the fact that, any information provided will be treated with tact and confidentiality.

Demographic Information
Gender: Male ( ) Female ( )
Age: ……
Occupation: …….
Marital status: …….

What are the different forms of agricultural technology used in the Tiko Banana Project?

1. In your opinion, what are some of the most useful forms of agricultural technology used in the organization? i)Tractors, ( ) ii) Bulldozers, iii) Airplanes, ( ) iv) Automatic water pumps, ( ) v)trolleys, ( ) vi) all of the above ( )
2. Please give reasons to justify your response

……
……
……
……

……

……

Have the different forms of agricultural technologies used improved productivity in the organization?

1. In your opinion, has productivity changed as a result of the use of the above mentioned forms of agricultural technologies? Low, **( )** extremely low, **( )** constant, **( )** high, **( )** extremely high**( )**
2. Please give reasons to justify you response…….

Are there any challenges faced with the technology that is, are they adequate or not?

1. What are some of the problems faced when using the various forms of agricultural technologies in the field?

.....

……

……

2. What can be done to improve the use of agricultural technologies in the field?
   ……
   ……
   ……
   ……
   ……