

**THE EFFECT OF TECHNOLOGY ON INDUSTRIAL GROWTH
IN UGANDA – A CASE STUDY FOR MUKWANO
INDUSTRIES IN MAKINDYE EAST,
DIVISION, KAMPALA
DISTRICT.**

BY

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DECLARATION

I (Hibira Vicent) hereby declare with honesty and sincerity that this piece of work is original and entirely a product of my own effort and that it has not been presented to any other institution of higher learning or university for any academic award.

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APPROVAL

This Research study report has been submitted with my approval as a supervisor.

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DEDICATION

I dedicate this piece of work to the members of management and all the workers of Mukwano industries in Makindye East Division for their assistance in providing information that helped me in compiling this field study report.

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The compilation of this research study has been a result of varied efforts and assistance from different individuals for whom I am most grateful.

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LIST OF ABBREVIATIONS

C18th	Eighteenth Century
E.g	For example
E.T.C	And So On
E.U	European Union
E.B.A	Everything But Arms
i.e	That is to say
L.T.D	Limited
Mr	Mister
MRs	Misses
NO:	Number
P.T.O	Please Turn over
U.M.A	Uganda Manufacturers' Association
VOL	Volume

ABSTRACT

In Uganda and the developing World as a Whole, **Technology** has continued to challenge the socio- political and Economical Institutions. **The effect of technology on industrial growth** in Uganda have been enormous. Consequently, the government, civil societies and the public have embarked on efforts to improve on technology so as to promote industrial growth.

The study adopted a descriptive and explanatory research design using both qualitative and quantitative methods of data collection such as interview, observation and questionnaire.

As well as statistical tables. The source of data (information) was management and employees of **Mukwano industries** located in Makindye East Division Kampala City.

The findings indicated that **Technology** was very vital for the industrial growth of Mukwano industries and to a large extent it had positively affected the growth of these industries. It was therefore recommended therefore that **carrying out education reforms**, supporting the **government efforts by the public** towards economic industrialization through encouraging science based courses at all levels of education would help in promoting technology and hence encouraging further industrial growth.

CHAPTER ONE

1.0 BACKGROUND OF THE STUDY

Introduction

Since 18th when the **industrial revolution** started in Western Europe, countries world over and Uganda in particular have been striving to attain economic growth based on **technology**.

Norma Harrison and Danny Somson in their book Technology Management - Text and International Cases asserted that, "in order to accomplish their strategic and operational goals, organizations must develop adequate technological base, that is they must develop the technological know how and the organizational levels for effectively building and deploying that know how". This therefore means that **technology** has got an effect on industrial growth or industrialization.

Even before the introduction of modern industrialization, studies indicted that traditional communities had small, traditional industries based on local **technology** like the black Smith. A case in point were the Baganda in Uganda local experience or technology and important to note is that it was this **backcloth** based on local experience or technology and important to note is that it was this

backcloth which formed one of their major exports in lucrative traditional inter tribal trade.

Although aware of the **merits of technology**, it was not until the 1950s and 1960s that strategies aimed at achieving industrial growth through technology were thought of. Such strategies among others included; the establishment of Uganda Development Cooperation in 1952, which started with a total of one hundred million shillings. Investors were also encouraged to start viable industries in various parts of Uganda including Kampala, Jinja, and Mbale in 1962.

By 1970, the manufacturing industry (sector) had achieved a reasonable growth, accounting for about 12 percent of the monetary value added exports. Unfortunately, further growth of the industrial sector was disrupted by the socio- economic and political turmoil of the late 1970s until 1987-1988 when the NRM government carried out the economic reforms.

Today, the Uganda Manufacturing Association (UMA) is one of the largest organizations representing the industrial sector of Uganda's economy of which Mukwano industries are a member. With the help of the Germany Technical Aid, UMA has set up specified schemes like quality and standards schemes to assist member companies, like Mukwano, to improve on their competitiveness to meet some of the challenges posed by globalization.

As a result, emphasis has been put on value addition to the products produced by Mukwano industries. Such products are

edible oil, cooking fat, and Mukwano Pure vegetable cooking oil, including detergents like Omo, Nomi and toss. All these have seemed to be possible through **technology** brought about by a combination of efforts from government support, the public and other development partners as well.

Nevertheless, despite Uganda's efforts especially from 1988 when the economic recovery policy was launched, **technology** seemed to have been a major concern for industrial growth at Mukwano industries.

1.1 Statement of the problem

In spite of the efforts by the Uganda government and policy makers to attain **industrial growth, technology** has still affected the process.

1.2 Purpose of the study

The purpose of the study was to examine how **technology** had affected the industrial growth of Mukwano industries in Makindye East Division in Kampala District.

1.3 Objectives of the study

(a) General objective;

To investigate the effect of **technology** on **industrial growth** of Mukwano industries.

(b) Specific objectives

The objectives of the study included;-

- Finding out the type of **technology** used at Mukwano industries.
- Finding out the advantage/effect of the types of **technology** used on the general performance of Mukwano industries.
- Finding out the effect of the types of **technology** on the industrial growth of Mukwano industries.
- Finding out the future prospects of improving on **technology** to promote further growth of Mukwano industries.

1.4 Significance of the study

The study might be useful to:-

- (i) The government and policy makers who might happen to read about the findings, they would benefit because it would provide relevant information about **industrialization** and industrial growth which might be useful when formulating and implementing the economic industrialization policies.
- (ii) The Industrial Entrepreneurs and all those who might wish to setup industrial enterprises might also benefit from the study since it would avail useful information about industrialization, the production **technology** types used putting into account the effects of such to be used and the possible measures to promote technology to achieve **industrial growth**.

1.5 Scope of the study

The study focused on Mukwano Industries in Makindye East Division and how **technology** had affected their growth both positively and negatively. The study was carried out within the boundaries of Mukwano Industries located in Makindye East Division of Kampala District.

1.6 Anticipated limitations of the study

The researcher faced some hinderences during the field study which included the following;-

- i. Shortage of funds for the required stationary, transport and meals. This was due to the uncertain changes in the price of items.
- ii. Some of the respondents dodge the researcher for interview as they considered it as wastage of time.
- iii. Some participants were not able to give the correct information and so the researcher had to spend a lot of time on data collection by applying a number of methods like questionnaires, observation and recording.
- iv. Most of the industry employees worked in shifts and duties; this made it a problem for the researcher to organize for a meet with them.

1.7 Definition of terms

(a) Technology

In the industrial context, technology refers to the art or applied science which is embodied in every activity which an industry performs. It may be in form of production

technology aimed at improving on the quality and quantity of output through research thereby promoting inventions, innovations, and discoveries.

(b) Intermediate technology

Type of technology which is between the traditional techniques of production and the modern methods of production i.e. it is neither labour intensive nor capital intensive.

(c) Industrial growth

This refers to the expansion in the industrial sector which involves improvement on the existing industry and also setting up new ones in order to increase the production of the manufactured goods.

(d) Industrialization

This is used to mean those activities in the industry where raw materials are either mechanically or chemically transformed into new products.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

In this chapter, the researcher reviewed other authors' literature which was related to **technology and industrial growth** or industrialization. Alternative sources such as text books, encyclopaedia, magazines, newspapers and other periodical publications with relevant information were reviewed.

The effect of technology on industrial growth was presented by the relevancy and the relationship between technology and industrialization as seen below;-

Technology seemed to have effect on industrial growth and industrialization both positively and negatively.

According to co-chairs of the Advisory Board (2000), The Global Competitiveness Report page 7 said that, "The Global Competitiveness Report (2000) includes a number of important innovations. To begin with, we attach significantly greater weight than before to **technology** as a key driver of sustained economic growth".

The role of education in achieving technological progress and narrowing the technological gap among countries was also emphasized.(Ibid page 7). This brings to us a good

explanation of how **technology** affects **industrial growth** which in turn affects the rate of economic growth.

This observation seemed to be true because it was evident that economies world over that recognized the significance (effect) of technology had achieved rapid industrial growth leading to economic growth and development.

Supportive to the above view are Theodore Rowland Entwistle and Jeans Cooke in the book: The General knowledge encyclopaedia Page 210 who asserted that, "Factory industry is the main way of producing wealth in the developed countries such as U.S, Japan, Soviet Union and Countries of Europe". However, it should be born in mind that without **technology** such factory industry could not exist and be expanded to produce wealth. Therefore, this seemed to partly explain why such countries in Africa, Latin America and majority of Asia whose strategies for technological progress are still inappropriate have low rate of industrial growth and hence low rate of economic growth and development.

Related to the above view, C.P Yadav in his book: Encyclopaedia of Entrepreneurship development (volume - 2) page 286 observed that, "The absence of an appropriate industrial climate and industrial base, coupled with lack of access to **relevant technology** has acted as a handicap for such countries to achieve rapid growth".

Wilson B. Brown and Jan. S. Hagendorn (1938) in their book: International Economics in the Age of Globalization Page 204 further pointed out that; "In some cases the choice of a technical standard is likely to have major effects on the National leadership in the production of a given item". United Nations had noted that Latin America exports were subject to almost 400 U.S trade barriers related to standards (Ibid Page 288).

Norma Harrison and Danny Somson also recognized the effect of **technology on industrial growth**. In their book: Technology, Management and International cases page 33 they noted that "Organizations need to be technologically equipped to meet their strategic objectives and to create new opportunities as well as respond to the threats created by the market environment and competitors' activities".

The previous findings (records) indicated that the level of **technology** and therefore industrial growth in Uganda and Kampala in particular had been still low but seemed to have improved over the recent years particularly since 1950.

Young and Lowry in their book - A course in World Geography 8 East Africa, Physical, Regional and Human Third Edition page 144 observed that "East of the city centre, the so-called industrial area lies along the Nakivubo drainage channel. It is still expanding eastwards".

It was further observed that "Until recent years most of the industries did little more than contribute imported manufactured goods. But since 1950 there has been a rapid growth of genuine manufacturing industry". (Ibid 204).

The Guide - Trade and Economic Development in Uganda (issue No.2, 2006) said that "Uganda's non - agricultural exports to the E.U have increased over the past decade with a recognized growth in non - agricultural export.

However Uganda has largely failed to utilise the various market access initiative provided by the E.U - especially under everything But Arms (EBA) by failing to diversify her export port-folio as well as through climbing the value added ladder".

The book emphasized that for Uganda to be able to benefit from the existing and future quasi full market access to E.U market it needed increasing move away from exporting only a few primary commodities and merely semi - processed or low technology products.

The above literature review seemed to show that there is a relationship between **technology and growth**.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter focused on the methods of data collection that the researcher used during the field study. They included such methods as observation, questionnaire, interview and recording.

3.1 Research Design

The researcher focused on both the management and the workers of Mukwano industries to obtain the data regarding **the effect of technology on the growth of Mukwano industries** located in Makindye East Division of Kampala District. This was carried out by using the different methods of data collection which included; questions, interviews, observation and recording.

3.2 Population, Samples, their selection and size

(i) Population

The study focused on the whole of Mukwano industries in Makindye East Division, consisting of members of management and employees who were 125 in number.

(ii) Samples and their selection

The study focused on respondents selected from the members of management and the workers of Mukwano

industries whose selection was on stratified basis (sampling). Here, the researcher identified groups in the population for example members of management and employees and then participants from each group were randomly selected.

(iii) Sample size

About 25 respondents both female and male were selected to participate in the research study and these were 18 years and above of age. The minimum age (18 years) was confirmed from records and working experience of at least six months and above. The selection of the samples was by use of randomisation (i.e. simple random sampling) where letters were written on pieces of papers and placed in the container and the rotary was then drawn.

- a) The reasons for the sample size and the procedure of their selection were: to ensure validity, reliability and also to avoid bias in the findings (data collected).

- b) The Validity and reliability of the study were measured by testing and retesting the obtained data, applying the various tools of research like observation, questionnaires and interviews to ensure accuracy, truth and dependability manifested in the research tools.

3.3 Instruments of data collection

The data was collected from the field using research instruments such as questions, interviews, observation and recording.

1) Questionnaires

The questionnaires were self administered by the researcher to the selected members of the Management and employees of Mukwano industries. They included both closed and open ended questions.

(a) Open ended question form:

This bore questions which required respondents to write the answers they wanted without limit. For instance, what type of production technology do you use at Mukwano industries and why?

(b) Closed form: This had questions that restricted the respondents to the predetermined responses and the respondents were required to indicate the options which reflected the degree of their opinions. Such questions included;-

(i) The type of technology named in (a) above is used because:

- It is cheap and therefore affordable.
- It requires limited skills.
- It is convenient for the level of industrialisation in Uganda.
- It is easy to access.

(ii) Technology is vital for industrial growth. (a)very true
(b) true (c) untrue (d) very untrue

The researcher used questionnaires because it covered a large number of respondents in a relatively short period of time. The questionnaires also allowed the respondents to

give free and independent opinions because they were not affected by the presence of the researcher.

2) Interview instruments

Interviews were administered to the selected members of management and workers of Mukwano industries using the interview guide which had questions like:-

i) What type of production technology do you use at Mukwano industries? Is it capital intensive or labour intensives?

ii) Do you think technology is vital for industrial growth or development?

a) Why do you think so?

iii) How has the type of technology named in (i) above affected the general performance of Mukwano industries and hence affecting the growth of the industries?

(iv) What future plans have you made or hope to design to promote technology so as to speed up industrial growth of Mukwano?

The researcher used interview because it provided immediate feedback and also gave a wide range of information in a relatively short period of time and therefore it saved time.

3) Recording method/instrument

This instrument was used in writing down the information given by the respondent during the field study. The information recorded was in response to the research interviews regarding **the type of technology** used at

Mukwano industries and **the reasons** for using such a type of technology, how technology had affected the general performance of Mukwano industries and thus affecting the industrial growth. The information about the future prospects to promote technology so as to speed up industrial growth of Mukwano.

3.4 Validity and Reliability of the study instruments

(a) Validity

The validity was ascertained by discussions. The instruments were discussed with fellow students and were passed onto the supervisor for approval to access their sustainability.

(b) Reliability

The reliability was established by using a test and retest method of the instruments that were used during the field study and the data that was collected.

3.5 Procedure

i) Permission to conduct the research study was sought from authorities such as the department of education of Kampala International University, Village and division authorities of Makindye east as well as management authority of Mukwano industries.

ii) Questionnaires were administered to selected workers and members of management of Mukwano industries after the researcher had been assured of Maximum confidentiality.

There were also some oral interviews to respondents and use of recording and sketches as well.

3.6 Data analysis or presentation

The data that was interpreted depended on the primary source of the respondents. But when analyzing it, considerations were taken; such variables included experience of the samples, their age and position to ensure reliability, consistency in acquiring information.

CHAPTER FOUR

PRESENTATION OF THE FINDINGS

4.0 Introduction

This chapter presents and explains the results obtained from the field study. The results include tables on the definition of the term "Technology", industrial growth, the types of technology reported, the effects of the technology types used on the general performance of Mukwano industries and the future prospects about improving on the technology so as to promote further growth of Mukwano industries.

4.1 The term "Technology" was defined in several ways by the selected members of management and workers of Mukwano industries located in Makindye East Division of Kampala City as shown in the table below.

Table 4.1 (a) Shows the different definitions of technology given by different respondents

Definition of technology	No of respondents	Percentage (%)
i) It is the use of scientific modes of production to improve on the efficiency of the production process	10	40
ii) The art or applied science which the industry uses in producing, marketing, the quality and quantity of goods it produces	8	32
iii) Are tools and techniques used in production, management and delivery of goods and services	4	16
iv) Technology is the way of improving and easing the production process.	3	12
Total	25	100

Source: Primary

The table 4.1 (a) above shows the number of respondents who defined the term "Technology in various ways. For instance, about 10 respondents (40%) defined technology as the use of scientific modes of production to improve on the efficiency of the production process. Eight (32%) respondents termed technology as the art or applied science

which an industry uses in producing, marketing, management and improving the quality and quantity of goods it produces while four (16%) respondents had it that technology refers to tools and techniques used in production, management and delivery of goods and services. Three (12%) of the respondents defined technology as a way of improving and easing the production process.

Table 4.1 (b) below shows the definitions of word "industrial growth" suggested by respondents.

Definition of "Growth of industry"	Respondents	Percentage (%)
i) Growth of industries is basically the increase in efficiency and output of products of an industry.	9	36
ii) It is the process that involves expanding the size of an industry by putting of New or more industries' by putting up new or more 4industries so as to increase the production of the manufactured goods/products.	10	40
iii) Growth of industries is the expansion of industries and their ability to increase on the volume of manufactured products.	4	16
Iv) It is the increasing rate of industrialization	2	8
Total	25	100

Source: Primary

Table 4 (b) above shows the definitions of the word **"Growth of industries"** suggested by the respondents of Mukwano industries in Makindye East Division of Kampala City/district.

From the table, 9 (36%) of the respondents gave their definition of industrial growth as basically the increase in the efficiency and output of products by an industry.

Some respondents 4 (16%) defined "Growth of industries" as the expansion of industries and their ability to increase on the volume of manufactured products. 2(8%) of the respondents suggested that "Growth of industries" is the increasing rate of industrialization. While the majority of respondents 10 (40%) said that growth of industries is the process that involves expanding the size of an industry by putting up new or more industries so as to increase the production of manufactured goods or products.

Table 4.2 (a) Below shows the relationship between "Technology" and "Industrial growth"

(i) Relationship between technology and industrial growth	No of respondents	Percentage(%)
	25	100
	Nil	0
(ii) Positive	11	44
Negative	Nil	0
Both Negative and Positive	14	56
Total	25	100

Source: Primary

From the table above (i), “**yes**” represents the number of respondents who answered that there is a relationship between **technology** and **industrial growth** while “**NO**” stands for the respondents who said that there was no relationship between technology and industrial growth. From table (i) still, we observe that there is a relationship between technology and industrial growth.

In table (ii), 11 respondents (44%) said that the relationship between technology and industrial growth was positive, whereas none of the respondents said there was a negative relationship between technology and industrial growth. Most of respondents 14 (56%) said that the relationship between technology and industrial growth was both positive and negative.

4.3 (a) In the table below are the types of technology used in Mukwano industries located in Makindye East division of Kampala City/District which respondents identified during the field study.

Type of technology	Respondents	Percentage (%)
Labour intensive technology	4	16
Capital intensive technology	6	25
Intermediate technology	15	60
Total	25	100

Source: Primary

From the table above, labour intensive technology was the least identified with only 2 (8%) respondents. Capital intensive technique of production was yet another type of technology which the respondents mentioned, with about 32% of the respondents.

Intermediate technology was the most mentioned with about 60% of the independent.

4.3 (b) the table below shows the reasons why the technology types mentioned in table 4.3 (a) above are used by the Mukwano industries located in Makindye East Division in Kampala District.

Type of technology	Reasons for its use	No of respondents
Labour Intensive Technology	<ul style="list-style-type: none"> - Labour is readily available - does not require a lot of skills - It is relatively cheap. - It offers a lot of job chances to manual labour 	4
Capital Intensive Technology	<ul style="list-style-type: none"> - It is cost effective in a long run - Leads to massive/increased production. - Leads to maximum use of resources. - It satisfies the demand. - It does a lot of work in a relative short time. - requires less supervision. - Encourages specialization. 	6
Intermediate Technology	<ul style="list-style-type: none"> -It is relatively cheap. - It is easily available. - It encourages the use of available resources like manpower. - It suits the government requirements. - It's establishment is less costly. - It is appropriate for the level of industry. - Requires relatively minimal skills to use. 	15
Total		25

Source: Primary.

From the table above, labour intensive had the fewest number of respondents who identified it as a type of technology used by Mukwano industries located in Makindye East division of Kampala city. The 4 respondents gave the following reasons why labour intensive technology was used by Mukwano industries, labour was readily available, it did not require a lot of technical skills, labour intensive technology is relatively cheap and it offered a lot of job chances to manual labor.

Some samples (6 respondents) identified capital intensive to be the type of technology used by Mukwano industries and gave reasons for its use as;- It is cost effective in a long run, leads to massive/increased production, it also leads to maximum use of resources, it doesn't a lot of world a relatively short period of time, requires less supervision.

Majority of the interviewees (15 members) mentioned intermediation technology and gave the following reasons for its use. It is relatively cheap, it is easily available, it encourages use of locally available resources like manpower, it also suits the government requirements, its establishment is less costly, it is appropriate for the size/level of the industry, requires relatively simple skills for its use.

4.2 According to the respondents, they said that technology is very vital (important) for growth of an industry like the Mukwano industries located in Makindye East of Kampala District/City.

Table 4.4 (a) below shows the importance of technology according to the respondents from Mukwano industries in Makindye East Division, Kampala District/City.

Importance of technology	Respondents (Number)	Percentage (%)
Introduces time factor which is an important element in production	5	20
It improves on efficiency of workers.	3	8
It also makes work less costly	2	12
Increases on production and productivity	3	20
Enables quick production of products to meet demand	5	12
Technology if appropriate can produce high quality products	3	16
Technology expands production for the available market	4	100
Total	25	100

Source: Primary

The table 4.4 (a) above shows the various importance (vitality) or significances of technology in industrial growth of Mukwano industries stated by different respondents. They included: introduction of time factor which is an important element of production with 5 respondents (20%), it improves on the efficiency of workers with 3 respondents (12%), makes work less costly with 2 respondents (8%), increases on production of productivity with 3 respondents (12%), enables quick production of goods/products to meet demand with 5 respondents (20%) quality products with 3 respondents (12%) and that technology expands production for the available market.

Table 4.4 b) Common technological or technical activities and their effects (both positive and negative) on the growth of Mukwano industries in Makindye East – Kampala City/District.

Activity	Effects (positive and negative)	No of respondents
(i) Production technology	-t has made it possible for Mukwano industries to improve on the quantity and quality of their products. However, it takes a lot of time to improve on quality goods since a wider research is required.	7
(ii) Marketing techniques like trade fairs, advertisements branding and packaging.	- It has improved on the total sale for goods produced by Mukwano industries. However, some branches do not give the true effect of their goods and some individuals become comnen.	8
(iii) Man power and managerial skills acquired in seminars, workshops, and trade fairs	- Have improved on efficiency and productivity of man power through innovations. Unfortunately, people have ended up dropping natural instincts of doing work and have always relied on book ideas.	10
Total		25

Source: Primary

The above table shows the common technical activities carried out by the management and employees of Mukwano industries located in Makindye East division of Kampala city, and the effects of such activities on the growth of Mukwano industries.

According to respondents, production technology had made it possible for Mukwano industries to improve on the quality and quantity of the goods produced. However it required a lot of time to improve on quality of goods since it required a wider research. This response was given by seven (7) respondents as shown in table 4.4 (b) above. About 8 (eight) respondents said that marketing technique like trade fairs, advertisements, branding and packaging had enabled Mukwano industries improve on the total sale for their goods/products since they (techniques) increased the number of customers. However, the respondents reported that some branches did not give the true effect of the goods and that some individuals become conmen to customers.

Majority of respondents (10 people) said that technologies like man power and managerial skills acquired in seminars, workshops and trade fairs had improved on the efficiency and productivity of manpower through innovations. Unfortunately, people (workers and management) had ended up dropping natural instincts of doing work and had always relied on book ideas.

4.5 a) The table below shows the general efficiency of technology on the growth of Mukwano industries reported by the subjects (respondents).

THE EFFECTS OF TECHNOLOGY ON THE GROWTH OF MUKWANO INDUSTRIES IN MAKINDYE EAST - KAMPALA	
POSITIVE EFFECTS	NEGATIVE EFFECTS
i) Technology has enabled Mukwano industries to improve on the quality and quantity of their products to the current demand and standards	- It takes a long period of time to improve quality because of the wider research needed.
ii) Technology (Like market research) has made it possible for Mukwano industries to capture a large for their products both within and outside Uganda.	- Some branches do not give the real/true effects of the good.
iii) Technology has enabled the management of Mukwano industries to come up with new ideas through innovations and discoveries.	However people have ended up dropping natural instincts to doing work and largely relied on book ideas.
(iv) Technology has enabled goods produced by Mukwano industries to match with the current competition posed by goods produced by other industries like BIDCO on the market.	Technology like research, packaging and advertising are very expensive.
V) Technology has improved on the efficiency of manpower.	Technology requires a combination of efforts to be developed (i.e. government, citizens and foreigners/however there is a lot of opposition from some politicians and citizens against foreigners who can boost technology.
Vi) Technology saves time in the production process which is a very important element.	
Vii) Technology has attracted the government support in form of tax reduction and holidays to the management of Mukwano industries so as to encourage further growth of industries.	

Source: Primary

Table 4.5 (b): Some of the new types/brands of goods Mukwano industries have just started to produce which were reported during the field study.

Type/brand of goods	Respondent (people)	Percentage (%)
Aquasipi- A new water brand on the market.	9	36%
Kyekyo – A nutritious energy drink.	7	28%
Sun juice- A refreshing cool drink.	6	24%
Bathing soap (yoyo)	1	4%
Cosmetics	2	8%
Total	25	100%

Source: Primary.

From the table above, the researcher observed a number of new brands of goods Mukwano industries had just started to produce as reported by the respondents. Such goods included; Aqua (a new brand of water) with 36% respondents (9people), Kyekyo which was identified as a refreshing cool drink with about 24% of the respondents. Bathing soap called "yeyo" and many various brands of cosmetics were the least reported with only 4% and 18% of the respondents respectively.

4.6 The table below shows the information regarding the future prospects (plans) about improving technology so as to promote further growth of Mukwano industries reported by the respondents during the research study.

Future prospects/plan	No of Respondents	Percentage (%)
The technology that Mukwano wished to introduce was that which suits the Ugandan way of doing things to improve not only on the products produced but also to suit Uganda's social, political and economic climate.	10	40
Enhancement of research (e.g. marketing, Advertising) and join cooperation with other industrial companies (through trade fairs and associations like UMA) increase public awareness about the produce by Mukwano and their quality by use of media such as radios, television and news paper advertisements within Uganda, East Africa and beyond.	15	60
Total	25	100

Source: primary.

From table (4.6) above, 10 (40%) respondents suggested that the **technology** that Mukwano wished to introduce was that which suits the Ugandan way of doing things to improve

on the products and also to suit the Uganda's society, political and economic climate.

15 (60%) of the respondents suggests enhancement of research (e.g. Marketing, advertising) and joint cooperation with other industrial companies (through trade fairs and associations such as UMA) to increase public awareness about the products produced by Mukwano and their quality of use of the media such as radios, television programs and Newspaper advertisement both with in Uganda, East Africa and beyond the Regional level.

4.3 Discussion of the findings

This chapter discusses the findings/results as presented in 4.0 – 4.6 above (Chapter four). The research was carried out at Mukwano industries in Makindye East Division of Kampala City. The respondents of the study were 25 in total. These were selected basing on the stratification where the researcher identified groups like members of management and the employees, and the participants from each group were randomly chosen on proportional basis. That is 15 participants from management and 10 samples from employees. 7 respondents were females and 18 were males aged 18 years and above.

According to the data obtained in the field, majority of the respondents (10 people) defined "**Technology**" as the use of scientific modes of production to improve on the efficiency of the production process. 8(eight) respondents referred to "technology" as the art or applied science which the

industry uses in producing, marketing, management and improving the quality and quantity of goods it produces. 4(four) of the respondents suggested that "**Technology**" are tools and techniques used in production, management and delivery of goods and services.

Only 3 out of 25 respondents defined "**technology**" as the way of improving and easing the production process.

Respondents also had different responses in regard to "**industrial growth**" as discussed below:

9(36%) of the respondents defined **industrial growth** as increase in the efficiency and output of products of an industry. 4(16%) respondents suggested that "**Growth of industries**" is the expansion of the industries and their ability to increase on the volume of manufactured products. 2 respondents reported that industrial growth is the rate of industrialisation whereas majority of respondents defined "**industrial growth**" as process that involves expanding the size of an industry by putting up new or more industries so as to increase the production of manufactured goods.

According to the researcher, the respondents defined the term "**technology**" and "**industrial growth**" correctly.

This is because according to the Reader's digest association in the Readers digest illustrated Encyclopedic Dictionary (Vol. two). Technology was defined as the application of science especially to industrial or commercial objectives or

the entire body of methods and materials used to achieve such objectives.

Therefore the respondents did not find much trouble in responding to most RECREC questions about "**Technology**" and "**Industrial growth**" since they knew what it meant.

In regard to the relationship between Technology and industrial growth, all of the samples (25 respondents) accepted that there was a relationship between "**technology**" and "**Industrial growth**". Out of 25 respondents, 11 sighted that there was a **positive relationship** between **technology and growth**. Majority of respondents 14 (56%) reported that industrial growth was both **positively and negatively** related to technology. This seemed to be correct because even Johnson N. Mugerwa (2003) observed that a firm or country has to decide on the technique of production to be used bearing in mind its effect on development.

The respondents from Mukwano industries also identified various types of technology that were employed at Mukwano industries which included **labour intensive technology** with 4(16%) respondents, capital intensive technology with 6 (24%) of the respondents, where as **intermediate technology** was suggested by majority respondents with about 15 (60%) of the respondents. Some of these means of production had been sighted in the literature review for example Johnson N. Mugerwa (up dated edition 2003) had talked of labour-intensive and capital intensive technology.

V.G. Marker (1995) had identified intermediate technology which was reported by majority of respondents during the field study.

The respondents at Mukwano industries located in Makindye east of Kampala city gave reasons to why the above types of technology were used as seen below.

Out of 25 respondents, 4 respondents reported **labour intensive technology** type and gave its advantages as being relatively cheap, it offers a lot of job to manual labour which is abundantly available and that it required less skills.

6 respondents **capital intensive technology** and said that it was used because it leads to increased production, it is time saving and it requires less supervision.

While 15 (60%) interviewees sighted **intermediate technology** and said that it encouraged, it was easily available, it encouraged the use of available resources like manpower, it was cheap and its establishment was less costly and it suited the government requirements (recommendation).

V.G Manker (1995) also had recognised the merits of intermediate technology by observing that it could help to solve economic and technological dualism which could cause unemployment and mass migration common among developing countries.

According to data obtained in the field study, all respondents said that technology was very vital for industrial growth and development of Mukwano industries. The respondents observed the following vitality (importance) of **technology** on **industrial growth** of Mukwano:-

Technology introduced time factor which was an important element of production. This factor was observed by 5(20%) of the respondents. Some other 5(20%) respondents sighted that technology enabled quick production to meet the increasing demand, 9(36%) respondents reported that technology improved on the efficiency of workers, increased on production and productivity and that appropriate technology could produce high quality products if improved. 4 (16%) out of the 25 (100%) said that technology made work less costly.

Thus, majority of respondents 10(40%) said that technology was important because it introduced the time factor in the production process and it enabled quick production to meet demand. Second ranked importance of technology was; improving on the efficiency of workers, increase on production and productivity and appropriate technology could produce high quality products. About 16% of the respondents said that technology led to expanded production and only 8% respondents suggested that technology made work less costly as in the table 4.4(a) above.

This importance of technology on the industrial growth seemed to be true because even Ritva Reinikka and Paul Collier (2001) had recognised the role of technology by observing that organisations need to be technologically equipped to meet their strategic objectives.

During the field study, the researcher identified some common technical activities carried out by the industries including Mukwano industries located in Makindye East of Kampala City and the respondents were requested to give the positive and negative effects of such activities.

These activities were **production technology, marketing techniques like trade fairs**, and managerial skills acquired in seminars and workshops.

According to the respondents for example, production technology had made it possible for Mukwano industries to improve on the quality and quantity of their products. However, it required a lot of time to improve on the quality of goods because it needed a wider research. Seven respondents said so. Eight respondents said that the marketing techniques like advertising and trade fairs had improved on the total sales for the goods produced by Mukwano industries. But on the sad note, some branches did not tell the true effect of their goods and some individuals turned to be conmen to attract customers.

In regard to manpower and managerial skills acquired through workshops, ten respondents identified that they had improved on the efficiency and productivity of the manpower through innovations. Unfortunately, people had ended up

dropping natural instincts of doing work and had always relied on book ideas.

Generally the following were the **effects of Technology** on the **industrial growth of Mukwano industries** according to Mukwano to the respondents;

Positively, technology had enabled Mukwano industries to improve on the quality and quantity of their products to suit the current demand and standards.

Techniques like market research had made it possible for Mukwano industries to capture a large market for their products both within and outside Uganda.

Technology had enabled the management of Mukwano industries to come up with new ideas, technology had improved on the efficiency of manpower, technology saved a lot of time in the production process and it had also attracted the government support in form of low taxes and giving tax holidays so as to encourage further industrial growth.

However, technology also affected the growth of Mukwano industries negatively because; it could take a long period of time to improve on production since it required a wider research. Some branches of Mukwano industries did not give the true effects of the products. Through techniques such as advertisements some individuals ended up becoming conmen, technology required a combination of efforts to be developed, technology had promoted over reliance on book

ideas other than natural instincts of doing work and had made goods quite expensive for low income customers.

While in the field, the researcher also wanted to find out the **future prospects** relating to **improvement on technology** so as to promote further growth of Mukwano industries located in Makindye East of Kampala City/District. In this respect, about 10(40%) respondents said that the **technology** which Mukwano wished to introduce was that which suited the Ugandan way of doing things so as to improve on the products produced by Mukwano industries and to suit the socio-economic and political climate of Uganda.

Majority of respondents 15(60%) people suggested that Mukwano industries wished to enhance research and joint cooperation with other industrial companies through trade fairs and associations like UMA to increase public awareness about the products by Mukwano industries.

In carrying out the field study, the researcher was also interested in finding out some of the new types of products that Mukwano industries had just started to manufacture due to technological improvement and the following products were mentioned. Nine respondents mentioned products like Aquasipi- A new water brand which was already on the market, seven interviewees mentioned kyekyo- a nutritious energy drink. About six respondents reported sun juice- A refreshing cool drink, one respondent mentioned yeyo bathing soap while two respondents mentioned some cosmetics as seen in table 4.5 (b) above.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

6.0 Summary

According to the investigation carried out about **the effect of technology on the industrial growth of Mukwano industries in Makindye East division of Kampala City**, the researcher found out that the types of technology used in Mukwano industries were **labour intensive, capital intensive and largely intermediate technology.**

The major reasons for the use of the above types of technology according the respondents were:- Labour intensive technology was relatively cheap, it could also offer a number of jobs to manual labour which was abundant. Capital intensive could lead to increased production, it was time saving and required less supervision. Intermediate technology encouraged the use of the available (local) resources and it suited the government requirements.

The major effects of technology on industrial growth of Mukwano according to the findings included the following: It made it possible for Mukwano industries to capture a large market for their products. It also improved on the efficiency and productivity; technology had made it possible for Mukwano industries to capture a large market for their products. However, the respondents also

highlighted some **side effects** associated with technology on growth of Mukwano industries such as; requiring a long period of time and wider research, it was also very expensive and had also led to dropping of the natural instincts of doing work.

The future prospects suggested to improve on technology in order to promote further growth of Mukwano industries were; Introduction of the technology type that could suit Ugandan way of doing things and enhancement of research like market of and joint cooperation with other industrial companies.

6.1 Conclusions

Both quantitative and qualitative methods of data collection revealed a wide range of essential information regarding **the effect of technology on the growth of Mukwano industries located in Makindye Division of Kampala City**. A large sample was employed in the field study and it was established that the types of technology employed by Mukwano industries were **labor intensive and capital intensive** on a minor scale and largely **intermediate technology**. A number of reasons served to explain why the above technology (intermediate technology) was largely used which included;-

It was less costly compared to others, it could also suit the government requirement and it was more appropriate. Technology was very vital for the industrial growth of

Mukwano industries and it had largely affected positively the growth of these industries. This is because it introduced the time factor in the production process, it improved on the quality and quantity of the products and it also improved on the efficiency of manpower. Nevertheless, technology was also associated with some weaknesses like; it required a long time to be improved upon and it was expensive;

6.2 Recommendations and policy implications

From the above conclusion (6.1), the following policy implications are recommended in accordance with the data collected on **the effect of technology on the industrial growth in Uganda;**

The government and other stake holders should carry out education reforms so as to transform education system from being over reliant on book ideas (theory) to practice. This should be done through encouraging vocational or technical education in order to impart practical skills that are required for scientific and technological inventions and innovations.

The public and other stakeholders should support the government efforts towards economic industrialization since industrialization is very vital as it increases the number of jobs for abundant labour force. This should be achieved through emphasis on science and technical based courses at all levels of education. This will encourage technological development and hence industrial growth.

Industrialists should be advised to use the type of technology which suits the level of Uganda's economy and the government's requirement. The technology chosen should embrace the use of the available local resources like manpower. It should also be in position to address the economic and technological dualism which is common among developing countries including Uganda. In this case therefore, intermediate technology is the most appropriate.

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APPENDIX

This chapter includes

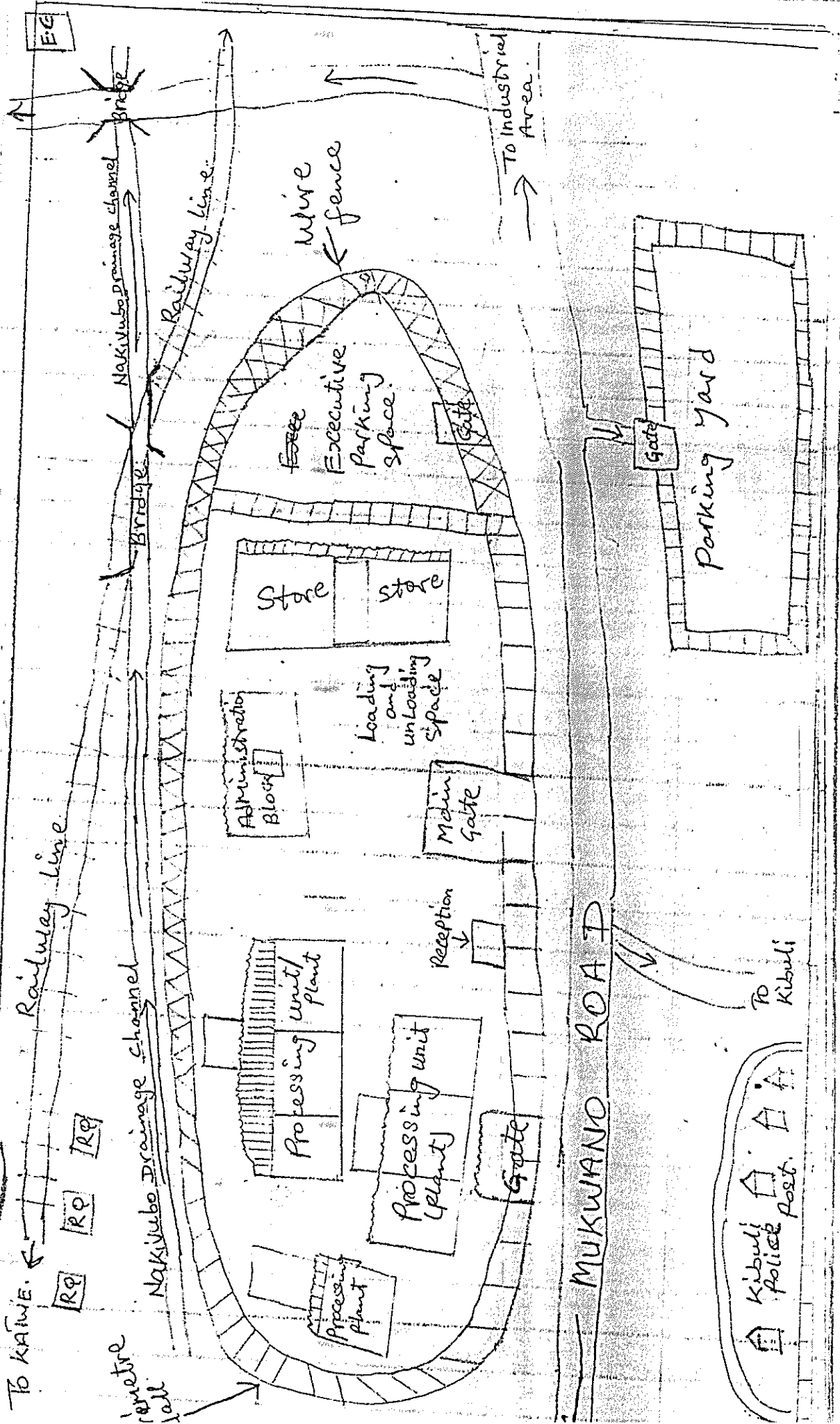
A) Sketch map of Mukwano Industries located in Makindye East of Kampala City/District.

B) Questionnaire about the effect of Technology on the growth of Mukwano Industries.

C) Introduction Letter.

IN MAKINDYE EAST DIVISION OF KAMPALA DISTRICT

TO THE YARD (Jinja Road)



TO KATWE

1 metre concrete wall

MUKWANO ROAD

Kibuli Police Post

TO KIBULI

Parking yard

TO INDUSTRIAL AREA

Wire fence

Store

Loading and unloading space

Admin. stration Block

Processing unit/plant

Processing unit (plant)

Reception

Main Gate

Executive Parking space

Railway line

Nakivubo Drainage channel

Nakivubo Drainage channel

Railway line

EG

KEY



R:O Railway Offices.

RQ Railway Quarters.

EC Electoral Commission

Bridge.

B) Questionnaires

Dear respondents, I request you to answer the following questions based on the research study being carried out about the **effect of technology on industrial growth of Mukwano Industries**. The questions are not intended to probe any one and any response or information given will be treated confidentially. Therefore, you are asked to answer the questions without bias, suspicion, fear or negative feelings, below are the questions:

Name of respondent Age years
.....Division/Village

Educational level (e.g. Primary, secondary, tertiary or University level).....

Department you are working in your designation (e.g. Manager, worker etc).....

Working experience Years/months.

1 a) (i) What is technology according to you?

.....
.....

(ii) What does the term "Growth of industries" mean to you?

.....
.....

(b) In the questions below, Tick the correct answer from the choice give below each question according to your knowledge.

(i) Technology is used to mean

a) Production of goods and services by the industry

b) The art of applied science which the industry uses in producing, marketing and improving the quality and quantity of goods it produces

(ii) "Growth of an industry" can be used to mean

a) The process that involves expanding the size of an industry by putting up new or more industries so as to increase the production of manufactured goods

b) It is the over production of manufactured goods by industries due to government control

2) a) Do you think there is a relationship between "technology" and the Growth of an industry" like Mukwano industries?

Yes

No

b) The relationship between "technology" and the "Growth of industry" is

(i) Negative

(ii) Positive

(iii) Both negative and positive

3 a) What type of technology do you think is used at Mukwano industries?.....

b) Give at least four reasons (advantages).

Why the type of technology named in (a) above is used

(i).....

(ii).....

(ii).....

iv)

(c) The type of technology used by Mukwano industries is

.....

- (i) Labour intensive
- (ii) Capital intensive
- (iii) No of the above

In question 4 below tick any three options from the list which you think are some of the reasons (Advantages) Why the type of technology chosen in 3(c) above is used.

4. The type of technology chose in 3 (c) above is used because;-

- It is relatively cheap
- It requires less skills to use
- It doe a lot of work in a relatively short period of time
- It offers a lot of job chances to manual labour.
- Requires less supervision
- It encourages specialization
- It is easily available

b) Do you think technology is important for the growth of industries?

.....
.....

(c) Give reasons to support your answer in 4(b) above

(i).....

(ii).....

(ii).....

iv)

In question 5 below, you are required to indicate the option you think is the most correct among the alternatives give below every question.

5(a) Technology is Vital for the Growth of an industry.

Very true

True

Untrue

Very and true

b) Technology is For industrial growth.

1) Very important

2) Some what important

3) Unimportant

4) Non of the above

6. Does Technology have an effect of growth of industries like Mukwano?

Yes

No

7 a) How have the following technological/technical activities affected (positively and negatively) the growth of Mukwano industries. Use the example given in 7 a i) below to fill in the black spaces.

Activity	Effects
	(Both positive and negative)
(i) Production technology	(i) It has made it possible to improve On the quality and quantity of goods Produced. However, it takes a lot Time to improve on the quality of goods because it requires wider research.

(ii) Marketing techniques (ii)
 Like trade fairs, advertising,
 Branding and packing

(b) Answer the statements given below by writing either false or true in the spaces provided.

(i) Technology has enabled Mukwano industries to improve on the quality and quantity of the goods produced.

.....

(ii) Technology like market research has made it possible for Mukwano industries to capture a large market for their goods.

.....

(iii) Technology like market research, packaging and advertising are not expensive.

.....

(iv) Technology has enabled the employers (management) of Mukwano industries to come up with new ideas through innovations and discoveries.

.....
(v) Technology takes a short period of time to be developed.

.....
(vi) Technology takes a long period of time to be developed (it consumes a lot of time).

.....
(viii) Technology requires the participation by government, citizens and foreigners to be improved on.

.....
C) Are there any new types of goods Mukwano industries have just started to produce?

.....
If any, what are they? List five of them.

(i).....

ii).....

(iii).....

(iv).....

(v).....

What are your future prospects (plans about improving technology so as to promote further growth of Mukwano industries?

(i).....

.....

(ii).....

.....

(iii).....

.....

(iv).....

.....

(v).....

.....

Thank you for cooperation

FACULTY OF EDUCATION

December 11, 2006

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

This is to introduce to you Mr. /Ms. HABIRU VICENT Registration No. A/16.279/42/04 who is a student of our University in the Faculty of Education.

He/She is undertaking a research project which requires your input as part fulfillment for the completion of his/her programme of study.

I kindly request you to avail him/her with all the necessary assistance.

Thank You.

With kind regards,


ODIRIMA MICHAEL
DEAN, Faculty of Education,
Kampala International University