3000 =

THE STATUS OF THE TEXTILE INDUSTRY IN A LIBERALIZED ECONOMY: A CASE STUDY OF THREE COMPOSITE FIRMS IN UGANDA

BY
FLORENCE N. TENHWA

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF SCIENCE IN TEXTILE SCIENCE AND DESIGN OF KENYATTA UNIVERSITY

SEPTEMBER– 2005

DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.

Signed: _____

FLORENCE N. TENHWA

Date: 1-9-2005

This thesis has been submitted with our approval as University Supervisors.

Signed: _____

PROF. OLIVE MUGENDA
DEPUTY VICE CHANCELLOR,
(FINANCE, PLANNING AND DEVELOPMENT)
KENYATTA UNIVERSITY

Date: _____

Signed: _____

DR. KEREN MBURUGU
CHAIRPERSON & SENIOR LECTURER
DEPT. OF TEXTILE SCIENCE AND DESIGN
KENYATTA UNIVERSITY

Date: 2.8.05

DEDICATION

To my beloved husband Julius, Grace Tenhwa and our children: Elijah Kisa , Esther Mugabi and Elisha Mwesigwa for their love , patience and prayers.

ABSTRACT

The purpose of the study was to establish the status of Ugandan textile industry in a liberalized economy. The study was conducted in three purposively selected composite textile firms in Uganda.

Indepth interviews were carried out with key informants. These included six (6) managers, ten (10) supervisors and sixty- four machine operators. Additional data were generated through direct observation using a checklist.

The objectives of this study were to: 1) determine the demographic characteristics of respondents in the selected textile manufacturing firms, 2) establish sources and costs of raw materials used in the selected firms, 3) establish the characteristics of the selected firms, 4) identify productions processes selected textile firms, 5) identify the marketing techniques used in the textile firms, 6) establish the role of Uganda government in promoting the textile industry, 7) identify constraints facing the textile industry.

Qualitative data analysis involved coding of the emerging issues. Presentation, discussion and conclusions were drawn from the emerging issues. Quantitative data were presented using frequencies and percentages.

The study found that the characteristics of the managers, supervisors and machine operators notably experience, education and training were important in promoting the status of the textile industry. Further, it was observed that education provided capacity to managers and workers for adoption of production and management techniques in the textile industry and enabled them to take advantage of the available opportunities for competitive and sustainable operations. Similarly, training of the workers enabled the managers and employees to carry out appropriate management, production and marketing activities.

It was noted that cotton was the major material and was locally sourced directly from ginneries in Uganda. This is attributed to liberalisation of the economy. Other inputs like dyes and chemicals were imported.

The study established that textile firms under study were large and employed both men and women. However, the proportion of men was higher than that of women. The major production processes identified were spinning, weaving, knitting, processing, cutting, sewing and finishing of the textile products. The firms targeted both local and international

markets. The products were rated as of quality standard by the manufacturers since they have been recognised internationally. Among the products identified were fabric for men's and women's apparel, uniforms for school, bed sheets, and mattress covers. Knit-wear such as T-shirts and briefs were cited in one of the firms. The study concluded that the status of the composite firms is promising and the firms have the potential to develop and compete with others on the international market.

Based on the findings of the study the following recommendations were made. The government of Uganda to :

1.) Continue taking strict measures to reduced importation of new and second-hand clothes, 2.)Encourage investments in the local textile industry 3.) Encourage training in the areas of training. 4.) In-service training was recommended for worker already employed in the textile industry.

ACKNOWLEDGEMENTS

I am greatly indebted to my supervisors Prof. Olive Mugenda and Dr. Keren Mburugu for their inspiration, encouragement and scholarly advice. Without their efforts completion, of this thesis would not have been possible.

My special thanks go to Prof. Lutalo Bbosa, Vice Chancellor of Kyambogo University who is spear heading the effort to ensure that his staff acquire the necessary academic standards. In the same vein, I take this opportunity to express my sincere gratitude to Kyambogo University Staff Development and Research Grants Committees for sponsoring this study. I also wish to thank Kyambogo University for granting me study leave so that I could pursue my studies.

My deepest gratitude goes to my husband Julius G. Tenhwa for willingly accepting to look after the family during my absence. Thank you for your love, endurance, financial support and prayers. A debt of gratitude is owed to my brother-in-law Colonel Obola Bernard and his wife Daphine for ensuring that I joined Kenyatta University. I wish to thank the managers, supervisors and workers of firms I visited for their good response whenever I approached them during the period of research.

To my friends, Phoebe Kabanza, Beatrice Elungata, Nyaga and Rael Maiyo, I say thank you for your contributions and companionship during my stay at Kenyatta University. Thanks to a number of other people who have contributed in various ways toward the completion and presentation of this thesis. Without their great contribution, this work would not have been completed. The list is too long to permit

individual mention but that does not indicate any dilution of my gratitude to Mr. A.D Bojana for editing and proofreading the draft and final work.

TABLE OF CONTENTS

Declaration.....ii

Dedication.....iii

Abstract.....iv

Acknowledgements.....vi

Table of Contents.....viii

List of Tables xii

List of Figures xiii

List of Acronyms xiv

CHAPTER ONE: INTRODUCTION

1.1 Background Information 1

1.2 Statement of the Problem..... 3

1.3 The purpose of the Study..... 4

1.4 Objectives of the Study..... 5

1.5 Significance of the Study..... 5

1.6 Limitations of the Study..... 6

1.7 Assumptions of the Study..... 7

1.8 Definition of Terms..... 7

CHAPTER TWO: LITERATURE REVIEW.....9

2.1 Introduction.....9

2.2 A Brief History of Textiles.....9

2.3 Scopeand Characteristics of the Textile Industry.....11

2.4 The Textile Industry in Developing Countries 12

2.5 Status of the Textile Industry in Uganda Prior to Liberalisation of the Economy in the Textile Industry 25

2.6 Policies and Textile Industry 33

2.7 Quality Control in the Textile Manufacturing Industry 38

2.8 Modern Technology in the Textile Industry 45

2.9 Problems Encountered in the Textile Industry.....47

2.10 Careeropportunities in the Textile Industry.....53

2.11 Textile Information Sources..... 53

2.12 Summary of Literature Review.....55

CHAPTER THREE: METHODOLOGY..... 57

3.1 Research Design..... 57

3.2 Study Location..... 57

3.3 Sample Selection of Textile Firms..... ...58

3.4 Development of Research Instruments..... 59

3.5 Validity of Instruments..... 60

3.6 Data Collection Procedures.....60

3.7 Operational Definitions of Variables..... 61

3.8 Data Analysis.....61

CHAPTER FOUR: RESULTS AND DISCUSSION.....63

4.1 Introduction.....63

4.2 Demographic Characteristics of the Respondents.....64

4.2.1Characteristics of Managers 64

4.2.2Characteristics of Supervisors 65

4.2.3Characteristics of Machine Operators 69

4.3 RawMaterials and Other Inputs 76

4.4 Characteristics of the Firm.....77

4.5 Production Processes/Processing Operations 85

4.6 Marketing Activities..... 93

4.7 Role of Uganda Government in Promoting the Textile Industry 93

4.8 Problems Encountered in the Textile Firms 94

CHAPTER FIVE: CONCLUSIONS ANRECOMMENDATIONS.100

5.1 Summary.....100

5.2 Conclusions.....103

5.3Recommendations..... 104

5.4 Suggestions for further research.....105

REFERENCES **107**

APPENDICES 111

APPENDIX 1 111

APPENDIX 2 115

APPENDIX 3 116

APPENDIX 4 117

APPENDIX 5 118

APPENDIX 6 119

APPENDIX 7 120

LIST OF TABLES

Table **Page**

1: Sample of machine operators 74

2: Work experience of machine operators..... . 75

3: Education of Machine Operators 76

4: Professional qualification of Machine Operators 77

5: Marital Status of Machine Operators 78

6: Gender Distribution of Machine Operators 78

7: Age of Machine Operators 79

8: Gender Distribution of the Workers in 2001 by Firm 85

9: Range of Qualifications of the Workforce in the Year 200 86

10: Range of Products in the Selected Firms 88

11: Labour Related Problems in the Selected Firms 101

12: Problems Related to Raw Materials Supply, Machinery and Spare Parts 104

LIST OF FIGURES

Figure **Page**

1: Professional Qualifications of Supervisors 72

2: Total Number of Workers in 2001 by Firm 83

List of Acronyms

ADB	African Development Bank
ADEC	African Development and Economic Consultants Ltd
AGOA	Africa Growth opportunity Act
CDO	Cotton Development Organisation.
ISO	International Organisation for Standardisation
UMA	Uganda Manufacturers Association.

CHAPTER ONE

INTRODUCTION

1.1 Background Information

The production of textiles is a global industry and many countries depend on it as an important contributor to their economies (Kitty, 1998). Beyond providing clothing and textile furnishings as basic human necessities, the industry is by far the world's leading manufacturing employer (Kitty, 1995).

The textile industry, just like the manufacturing sector as a whole, has been rapidly expanding over the past decades. In the United States, for example, the textile industry is a tremendous complex and is the largest source of industrial employment, providing jobs for more than 25 million people. The U.S. textile industry has a commendable record of investing in advanced technology to improve labour productivity which in turn has sustained profits. A close look at California's leading textile firms shows success based on creativity, unique products, and perhaps most importantly, a willingness to work close to market on custom basis (Rudie, 1998). In countries such as Pakistan and Bangladesh, for example, textile products account for nearly 70 per cent of the countries' total exports (Kitty, 1998).

In African countries, studies have shown that the textile sector has the potential if fully exploited (Werberloff, 1987). For example, Kenya's textile industry has the potential of producing enough quality textile products for the domestic market and export (*Daily Nation*, 10, January, 1995). However, with the liberalisation of the Kenyan economy, the volume of imported new and second-hand (*mitumba*) imported clothes

has increased, offering serious competition to the local textile industry (CBS, 1993). Studies indicate that Kenyan consumers preferred *mitumba because they* were sold at lower prices and yet of higher quality than the local ready-made clothing (Otieno, 1990; Nyangor, 1993). The competition has led to the steady decline of the Kenyan clothing industry, over the past discouraging investment in this sector.

The textile industry in Uganda was developed by the late 1960s. Cotton was a major domestic raw material and Uganda's most important export crop. In the sixties, the state of the industry was encouraging and enough fabric was produced both for the domestic market and export. Like any other developing country, Uganda's early approach to industrialisation focused on the strategy of import substitution to reduce imports (GoU Ministry of Trade and Industry, 1994). According to the 1989 census of industrial establishment, the state of the manufacturing sector was dominated by consumer goods. Textiles, apparel, leather and foot wear accounted for 9 per cent of the total establishments and employed 17 per cent of the labour force. Between 1989 and 1993, domestic fabric production was 11 million linear metres; imported was 28 million linear metres and imports of second-hand clothes accounted for 30 million linear metres. This indicates a decline in status of the local textile manufacturing industry.

Between 1994 and 1999, a major programme was implemented to revive the critical textile industry which would necessarily involve the promotion of cotton growing. In addition, a number of mills were either privatised or restructured to increase capacity utilisation, diversify product ranges for both domestic and export markets. There was need

for substantial financial investment to modify and upgrade existing plants and machinery so as to produce high quality fabric to compete with second-hand clothes that were dominating the market.

Since 1987, Uganda has been implementing several economic reforms and policies aimed at making the private sector the main engine of economic growth and development. According to African Development Bank (1994), the main objective of economic policy is to sustain improvement in economic and social welfare, by maintaining economic growth with macro-economic stability. To achieve this objective, the textile sub-sector was identified as one sub-sector of manufacturing which should play a catalytic role in Uganda's economic growth process. If the textile sub-sector is developed, job creation should be boosted and foreign exchange earned.

Based on the information above, it is evident that the textile industry is recognised as an important part of Uganda's economy and a generator of employment. Although efforts have been made by the government to promote the industry, there is no documentary evidence on the status of Uganda's textile industry following economic liberalisation. The study therefore, is intended to fill this gap.

1.2 Statement of the Problem

Whereas liberalisation has opened doors for investment and facilitated drive for export markets, it has also spelled trouble for firms particularly in the textile sector (Nyangor, 1993). For example, the steady decline of the Kenyan clothing industry has been attributed to competition from imported clothes that are cheaper and often of higher

quality, discouraging investment in this sector. Yet this industry has the potential to produce enough quality textile products for the domestic market and export. However, there is very little or no documented evidence available on the present state of the Ugandan textile manufacturing industry following economic liberalisation. This study, therefore, sought to investigate the situation in Uganda's textile sector. amid competition from importers of textiles. There is need to investigate the impact of the economic policies and liberalisation on the textile industry with regard to the kind of raw materials, production process and textile products being manufactured for the domestic and export markets.

1.3 The Purpose of the Study

Based on the problem stated above, the purpose of this study was to explore the status of the textile manufacturing industry in Uganda's liberalised economy. The study also aimed at establishing constraints investigated was related to the role of Uganda Government in promoting the textile industry influencing the status of the textile industry. Another aspect of interest.

1.4 Objectives of the Study

In this, study the researcher sought to achieve the following objectives:

1. To determine the demographic characteristics of the respondents in the selected textile manufacturing firms.
2. To establish sources and costs of raw materials used in the selected firms.
3. To establish the characteristics of the selected firms.
4. To identify production processes in the selected textile firms.
5. To identify the marketing techniques used in the textile firms.
6. To establish the role Uganda Government in promoting the textile industry.
7. To identify constraints facing the textile industry.

1.5 Significance of the Study

This study is of considerable importance because of the persistent need to enhance the role of the textile industry and because of the on-going reforms, which are shifting responsibility for industrialisation and economic development from public to private sector. Such shift will ensure that local industry has the capacity to contribute to industrial and economic development.

The results of this study will provide information on the current status of the textile industry. The findings will be made available to the manufacturers of textiles, ministries of trade and industry, and education.

For example, findings on production methods and marketing techniques will be shared with management of the selected textile firms for improvement if need be. Constraints identified will also be presented so that appropriate action is taken.

Findings on influence of economic policies on the textile industry will be forwarded to the Uganda Government through the Ministry of Trade and Industry for further consideration. For example, the impact of regional groupings such as the Common Market for Eastern and Southern African States (COMESA) and the East African communities will be highlighted.

Results on the quality of textile products will be made available to Uganda National Bureau of Standards (UNBS) responsible for specifying standards that ensure quality textile products for the domestic market and export.

Findings on educational and training backgrounds will be shared with the Ministry of Education and Sports which is in charge of schools, colleges and universities so that the courses offered in the area of textiles are relevant.

The concern was specifically to identify inputs, outputs, market outlets. The constraints that hinder development of the textile industry would help to understand the shortfalls in government policy intervention initiatives.

1.6 Limitations of the Study

The study was limited to an investigation of status of the composite textile sector. The study concentrated on three firms that

manufacture fabrics by weaving and knitting methods. The firms are integrated. Sectors producing accessories, blankets and industrial applications such as tyres were not included in this study. Therefore, any generalisation to other firms should be made with caution.

1.7 Assumptions of the Study

1. The selected firms are operating in a liberalised economy.
2. It is assumed that the selected firms have an organisational structure headed by a managing director with departmental managers below him.

1.8 Definition of Terms

The following terms have been used in this thesis.

Composite textile firms – Manufacturing firms that carry out various activities such as spinning, weaving, printing etc.

Economy – The entire process of production, distribution and consumption of textiles.

Fibre – Any substance, natural or man-made, with a high length-to-width ratio and with suitable characteristics for being processed.

International trade – Exchange of goods and services among nations.

Liberalisation – The act of importing and exporting of textile products among nations with very few controls.

Market – An environment where there is exchange of goods and services through buying and selling and where there is an atmosphere of free choice by consumers.

Marketing – The process by which textile manufacturers make their products available to consumers.

Policy – A course of action that has been officially agreed and chosen by a political party or textile firm.

Status – The state of the textile industry.

Technology - Knowledge about scientific or industrial methods or the use of these methods. Machinery and equipment used or developed as a result of this knowledge.

Textiles – A generic name for natural and man-made fibres and yarns used to construct fabrics. Also refers to fabrics and the finished goods.

Textile industry – Deals with production of fibres, yarns and fabrics.

Trade liberalisation – Free trade or international trade that is not restricted by government measures at protecting domestic industry.

Yarn – A strand of textile fibre in a form suitable for weaving, knitting, braiding, felting, webbing or otherwise fabricating into a fabric.

Large-scale – Textile manufacturing firms with fifty or more employees.

Fabric finishes: Refers to the treatment applied to the fabrics during their manufacture with an aim of improving their function in use or physical appearance.

Employment opportunities: Refers to careers available in the textile Industry.

Constraints: These are problems that managers experience in the course of executing their duties.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The literature has been reviewed under the following sub-headings: A brief history of textiles; scope and characteristics of the textile industry, the textile industry in developing countries, status of the textile industry in Uganda before liberalisation of the economy; policies and the textile industry; quality control in the textile industry; modern technology in the textile industry; problems encountered in the textile industry; career opportunities in the textile industry; textile information sources.

2.2 A Brief History of Textiles

The present textile industry is deeply rooted in its past. In fact, to understand the structure of the present textile industry one must understand something about its history. Textile history can be looked at from various viewpoints. It involves many disciplines namely anthropology, archaeology, religion, chemistry, art and crafts. Politics and economics are also intricately woven into textile history. Textiles from all over the world, before and now are different (Wilson, 1979).

Archeologists tell us that woven plant fibre fabrics were made more than eighty-five hundred years ago in Catal Huyuk, a hunting village in what is today the country of Turkey. A number of Mexican textiles date between 7,000 and 5,000 B.C. The only fibres available then were found in nature and the processes used to make them were

manual. Limitations imposed by lack of technical knowledge often put restrictions on what could be made (Ibid).

Wilson (1979) continues to say that if clothing and protection from the elements of nature were primary concerns, people sought economical and fast methods of construction. Often designs were modified from traditional to meet the needs of the customer. Textiles made for religious purposes were important for their symbolism; for a belief in life after death resulted in fabrics of intricate design and fine quality. Women were able to identify the materials that were strong and of considerable length for spinning. Although many material were spun, the ancients mainly used cotton, flax, silk and wool

Technology for spinning developed slowly. Fibre preparation and yarn making were never ending tasks until the nineteenth century. Around 750 A.D. in India the Spindle was mounted on a frame and rotated by turning a wheel that held a cord attached to the spindle. The Chinese added a treadle that accelerated the process, but many wheels of this nature continued to be turned by hand.

The cotton industry was well-developed by 1500 B.C. It was basically an individual domestic activity. By the thirteenth century, the cotton industry was well-established in Italy. The invention of machines such as the flying shuttle (1733), the spinning jenny (1767) and the mule (1775) during the industrial revolution of the eighteenth century markedly ushered into the textile industry a new competitor – cotton. This tremendously changed the status of the industry from handicraft and largely domestic to a real capitalistic mode of production (African Development and Economic Consultants, 1998).

The nineteenth century saw cotton textile industry firmly move to countries such as USSR, Japan and China. It is evident that cotton textile industry helped industrialisation in Europe, moved to America then to Asia. Africa has a long history of producing textiles from cotton, its important fibre. By 1984, textiles accounted for 21% of the total manufacturing value added in 45 developing countries (Werbeloff, 1987).

Chole (1973), observed that efforts at industrialisation in most of the underdeveloped world had a relied and continued to rely on "strategy" of import substitution. He noted that Ethiopia had not been an exception to this and the textile industry was among the sectors of the economy in which the process of import substitution had advanced farthest.

2.3 Scope and Characteristics of the Textile Industry

The textile industry is concerned with the production of natural and manufactured fibres, yarn spinning, weaving, knitting, bonding, felting, cutting, sewing and styling. The textile industry is labour-intensive and provides employment to people of varied skills. It also contributes to the economy through local and export sales.

The industry consists of firms which vary widely in size. The actual size of a particular firm depends on range of products and level of integration with textile production and sales activities. The textile industry is responsible for producing a wide range of products to meet the market needs. These include fabric for apparel, home furnishings and industrial products such as conveyor belts. The industry also makes women's wear and children's wear (Cooklin, 1991). Large-scale manufacturers may produce fabric or garments on order for a customer

who will provide the design specifications. Alternatively, the manufacturers provide a design that is then produced using fabric and notions of their choice and distributed to interested wholesalers or retailers. Large firms tend to specialise in only one category, while smaller ones produce a variety depending on the orders received and their flexibility in responding to fashion change (Oigo, 2000). In her study, it was further established that the characteristics of the firms and competencies of the quality managers influence the quality of products. Some firms are responsible for all production stages in textiles, others do only spinning and there are those that use ready fabric to produce garments. This study however investigated the characteristics of composite textile firms.

2.4 The Textile Industry in Developing Countries

The cotton textile industry, which is now widespread in the world, has been commonly one of the first industries to be established in developing countries seeking to lay foundations for an own domestic industry. India is a good example.

The African Development and Economic Consultants (ADEC 1998), outlined reasons why other developing countries should consider investing in the cotton textile industry for industrialisation. They include:

1) The effective demand for cotton cloth is widespread in poor economies given that, the need for clothing is as important as other basic needs such as food and shelter. The production of cotton

goods within national boundaries becomes advantageous in many respects including saving of foreign currency on imports.

2) The various processes involved in machine production of cotton cloth are comparatively simple, and the necessary skills can be acquired fairly rapidly.

3) The capital requirements of the industry are modest. This is so since the economic advantages of large-scale production may not be very great and a small-scale enterprise is not disadvantaged.

4) The raw cotton required by the industry though fairly bulky, is easily handled and transported. It also carries a fairly high value per unit weight. This means that the cotton textile industry need not particularly be tied to a raw material source location.

5) Various branches of the cotton textile industry (ginning, spinning, weaving and finishing) can be located independently of each other, and in practice this leads to regional specialisation within the industry.

6) Material wastage incurred during the various processes of manufacture in the cotton textile industry is minimal compared to wastage which occurs in other industries such as iron extraction from iron ore in a blast furnace.

2.4.1 Cotton Fibres

According to Gohl, et al (1983), as the cotton fibre is obtained from a plant it is classified as a natural, cellulosic, seed, mono-cellular, staple fibre. The length of a textile fibre is an important factor in spinning yarn. This is particularly so with cotton, which is a relatively short staple

fibre. The longer the fibre, the easier it is to spin into a smoother, stronger yarn. In turn, this results in a more comfortable, more durable, more attractive fabric and garments. Very fine fibres permit the manufacture of fine, light weight cotton fabrics and garments, despite variation in the fibre diameter compared to wool for instance. The colour of cotton fibres depends on its type, environment, soil and climate conditions under which it is grown. These factors influence the amount of protein and minerals which will occur in the fibre and thus, its colour. Cotton is considered to be a relatively easy fibre to dye and print.

Barnet (1997), says cotton is such a popular fibre because the qualities it possesses make it useful in many situations and circumstances. These properties include: capacity to absorb moisture; minimal build-up of static electricity; good reaction to chemicals; versatility (can be woven and knitted into a wide range of fabrics; its appearance can be changed easily, for example bleaching provided is done carefully, glazing, embossing and mercerisation. Dyes suitable for colouring cotton are azoic, direct, reactive sulphur and vat dyes (Gohl, et al 1983). The ease with which cotton takes up dyes and other chemicals is due to polarity of its polymers and polymerisation system. This polarity will readily attract other polar dye molecules into the polymer system.

2.4.2 Manufactured Fibres

According to Jerde (1992), manufactured fibres are used for textiles and home furnishings and a great variety of applications in medicine, energy and industry. All manufactured fibres are formed by

forcing a thick fluid through tiny holes in a metal plate called a spinneret in the extrusion process. Manufactured fibres can be grouped into two broad categories, cellulosic and non-cellulosic, based on raw material they are derived from. The three cellulosic fibres (acetate, rayon and triacetate) are made from modified wood pulp, which is dissolved in an organic solvent such as acetone so that it can be extruded through the spinneret.

Burkinshaw (1995), points out that the undeniable outstanding success of polyester fibres, can be attributed to their excellent properties and generally very high chemical resistance under typical dyeing and finishing conditions. Polyester is the most versatile of all manufactured fibres because it has the widest range of uses. Owing to the compact and highly crystalline structure of the hydrophobic fibres, the rate of dye diffusion within the fibres is very low.

2.4.3. The Textile Production Processes

The production processes comprise spinning, weaving/knitting and processing. Joseph (1981) and Bernatt (1997), have described the following processes involved in yarn production at the textile mill. According to Joseph (1981), spinning consists of opening, cleaning and blending. Staple fibres arrive at the processing plant in large bales. These fibres must be cleaned and blended. Several bales or cartons of fibres are placed in the opening, cleaning and blending area.

The cotton is opened, to remove sand, grit and any other impurities. Openers have a beating mechanism which loosens the fibres

and separates the impurities from the fibre. The fibres are then blown against a perforated drum to remove the sand and grit.

To obtain complete intimacy of blend and remove all the trash trapped in the cotton, it is essential that the cotton is completely opened up to the single fibre state. These three essential functions occur simultaneously during the series operations which start in the mixing room and end at the card. A scratching machine continues the cleaning process by further beating and then it rolls the fibre into sheets called laps, ready for the next stage of production.

Carding

A carding machine consists of rollers which have pointed wires sticking out from the surface. Carding is like a combing process. The wire points pull the cotton fibres to make them parallel to each other and then separate them, making a web-type structure. The fibrous web then forms a sliver (rope). The friction from the fibres holds them together at this stage.

Drawing and Drafting

The thickness of the sliver is reduced by drawing and drafting. These processes are carried out using a series of sets of rollers, each set working faster than the previous one. The processes make the silvers more regular and fine enough to spin into yarns.

Spinning

This is the final process of the yarn production sequence. A cotton-spinning system was developed especially for spinning cotton. It is based on what is called ring spinning. In ring spinning, when the roving leaves the final drafting rollers, it passes through a hole, called a pot eye, and under a small ring, called a traveller, to the bobbin. The bobbin turns on a spindle and the resulting yarn is evenly wound around it. The yarn is twisted during this process. Cotton can take a very high twist which makes it stronger. According to Wingate (1984) the spinning process has been automated. Unfortunately, most of the modern machines are made abroad. There is need in countries like Uganda for more research and development of both the mechanical and electronic methods of manufacturing yarn and fabric.

The next process is the production of fabric from yarns. Two processes are involved, they are weaving and knitting.

Weaving

Weaving is one of the processes which use yarns to produce a two-dimensional fabric. The yarns are interlaced at right angles to each other during the weaving process. The yarns which run lengthwise in a fabric is called the warp and the yarns which go across the width of a fabric is called the weft. The warp yarns are known as ends. The weft yarns are known as picks.

The loom is set up with the warp yarns. For the first row, the weft yarn is woven over the first warp thread and under the next warp thread, and so on. For the next row, the weft is woven under the first warp thread and over the next warp thread and so on. The weaving continues in this way, alternating under and over actions as described. A shuttle is used to do this.

Groups of warp threads are lifted up and down by a frame called a heddle. The warp yarns are fed from the warp beam to the breast beam. The heddle shafts lift them according to the pattern required. The reed holds the lifted yarn in place and the shuttle threads the weft yarns through to produce woven fabric. This is wound on a cloth beam. According to Wingate (1984), the various motions made in a hand weaving had to be automated. The power loom of today is essentially the handloom adapted to rotary driving. Shuttle looms are extremely noisy. To overcome these deficiencies, looms have been invented that transport filling yarns without a shuttle. These shuttles weaving machines are faster and less noisy than are shuttle looms and their operations are monitered by computer.

Knitting

The knit construction is based on a continuous yarn arranged with interlocking loops (Bernatt, 1997). According to Brackenburry (1992), knitting is one of the most important processes for producing garments and worldwide and represents a considerable and increasing percentage of the population's apparel. The author explains that knitting is used to produce garments that cover every part of the human body, in a wide range of garment types from socks, caps, gloves and underwear to upper

and lower body garments varying from T-shirts to formal jackets. In spite of this range, the treatment of the fabric to produce various garments have a great deal in common. Machines for knitting include electrically controlled circular Morat weft knitting, tricot machine and raschel knitting machine.

Brackenburry (1992), clarified that within government industrial statistics, the firms producing knitting garments are not classified as part of the clothing industry but as part of the textile industry. Nevertheless, in spite of the separateness of the knitted garments industry within the fully cut sections, there is a considerable sharing of production technique with the industry using woven fabrics, in pattern generation, lay planning, cutting and production planning and organisation.

Cutting and Construction

Cutting

The garment pieces are cut from the fabric, using the cutting marker as an outline. Bernatt (1997), cautions that the pieces must be cut accurately to shapes of the pattern to ensure that garments fit properly and can be made up satisfactorily.

Different types of cutting tools are used according to the number of layers of fabric in the lay and the bulk of garments to be cut. Hand shears are normally used for one or two layers of fabric. When there are more plies, cutting is more likely to be done with a straight knife, a round knife or a band knife. Automated machines such as die cutting machines are sometimes used. Bernatt (1997), explains that this

machine has cutting tools which are the exact shape of the garment pieces; the pieces are stamped out on a base plate. However, she comments that these machines are expensive and are therefore used only for garments which remain the same for a long time, such as work clothes and overalls. There are also computer-controlled fully automatic cutting machines.

Notches position marks have to be made on the finished garment. Hot notches contain a heating element which scorches fibres slightly, to prevent the mark disappearing or fraying.

Construction

The next step in production is construction, which means putting the garment together. There are different systems used. Bernatt (1997), has described the following. These include make-through, the progressive bundle system; the unit production system (UPS) and the Toyota sewing system.

Applying Colour

Colour is an important consideration when choosing textiles and textile items. When designing for manufacture, planning colour schemes is important; colour schemes must appeal to the target market. Modern consumers demand that textiles are attractive, colourful and resistant to spoilage by wear, sunlight and modern laundering systems. The colours and designs needed are produced by dyeing and printing fibres, yarns and fabrics using a variety of methods which fulfil those demands

(Bernatt (1997). Whatever the method used, the consumer expects the colour to be permanent.

Dyeing and Printing

According to Gohl *et al,* (1983), in dyeing and printing, the molecules of the organic compounds, dyes are responsible for the colour of dyed and printed textile fibre materials. Textile materials are coloured when dye molecules enter the armophous regions of the fibre's polymer system.

Dyeing

Dyeing is the process of colouring textile materials by immersing them in aqueous solution of dye, water and auxiliary. In industry, dyes are often referred to as dyestuffs. Dyes are added during processing. Most modern dyes are synthetically manufactured to imitate natural products. Bernatt (1997), explains that successful dyeing depends on the extent to which the dyestuff will bond to the fabric (or yarn) and remain fast and adds that this is not as easy as it may sound because dyes and fibres are made of different chemicals. It is essential that the right dyestuff is chosen for a particular fibre or fabric. Bernatt (1997) also points out another problem which arises in dyeing two different fabrics the same colour, as the two fabrics may need different dyes to achieve the colour match.

The textile/dye colourist must be able to achieve the right colour; match colour on two (or more) different fabrics; make sure the colours

are fast; make sure the dye is applied evenly and ensure that the fabric is not damaged by the process (Bernatt, 1997).

Dyeing Method

Dye is almost always either dissolved or suspended in tiny particles in water. The textile is then immersed in it. The temperature of the dye solution and the time for which the textile is immersed depend upon the type of dye being used. Some dyes can work in cold water but most dyes need heat and considerable amount of time to produce successful results (Bernatt 1997). Gohl *et al,* (1983), explain that in addition to dissolving the dye, water acts as the medium through which the dye molecules are transferred into the fibre. Heat is necessary to encourage dye to leave the water and enter the fibre, as well as to ensure adequate penetration of the polymer system of the fibre. Heating the dye liquor causes water to dissociate somewhat more than at prevailing room temperature and to become slightly more ionic. In this state, water tends to repel the organic dye molecules to a greater extent, ensuring readier uptake of the dye molecules by the fibres polymer system, making the polymer system more accessible to the relatively large dye molecules. Water, assisted by heat, also swells fibres that are hydrophilic. The addition of an electrolytes to the dye liquor of ionic dye increases the uptake of the dye by the fibre.

The methods and machines commercially used for dyeing vary according to the fibre type and whether fibre, yarn or fabric is being dyed. Not all fibre types take up dye readily. For example, cotton and

polyester react differently to dyes. Some dyes are good with polyester but not with cotton and vice versa.

Bernatt (1997), explains the following processes: There is the Batchwise process where a whole batch of textile material passes through a single process in a given amount of time. After this process, the textile material usually has to undergo two additional processes; the first is fixation and the second is washing. Fixation is the fixing of the dye to make sure it is fast. This is carried out using steam which condenses on the textile; this transfers heat and helps the dye stuff to be diffused within the fibres. Washing removes excess dyes and chemicals.

In the continuous process, the textile material passes through a sequenced series of processes where it is dyed, the colour fixed and, if necessary, the textile is washed. The addition of an electrolyte to the dye liquor of anionic dye increases the uptake of the dye by the fibre. The electrolyte used in dyeing dissociates completely in the aqueous dye liquor. This increases the forces of repulsion between the dye molecules and water so the dye is attracted by the fibre. The use of electrolyte such as sodium chloride or sodium sulphate means that one of the dissociation products is sodium ion (Na^+).

Scouring After Dyeing

Dyeing always leaves some dye molecules on the surface of the fibres of the dyed textile materials. It is essential that these dye molecules be removed when dyeing is completed. If these dyes are not removed, they may result in two problems.

i) Poor rub-fastness which may result in dye rubbing off onto adjacent materials.

ii) Poor wash-fastness which may result in other fabrics being coloured by this excess dye during laundering.

Fabric Printing

The printing of textile materials is the application of colour according to a predetermined design. The printing paste which is applied to textile material consists of dye, water, thickener and hydrocarbon solvent or oil. After printing paste is applied, the textile material is usually steamed. This enables the dye molecules to migrate from the surface of the fibre and to enter the fibre polymer system. Steaming swells the fibres and ensures better penetration of the dye and improves colour fastness properties of the textile material.

The general theory of printing explains the interactions on steaming, between the dye, fibre, water, thickener and hydrocarbon solvent. After printing, it is usual to steam the textile material. This is done to achieve colour-fastness. Steaming ensures adequate penetration of the fibre by dye molecules.

Washing

This has to be done to remove the thickener and other printing paste constituents which have not entered the polymer system of the fibre. There will always be some dye molecules left on the surface of the fibres and these must be removed in the washing-off process.

There are three basic methods of printing onto fabric: These are: block printing, roller printing and rotary and flat bed screen printing. The one you choose will depend on the quantity and quality you require and what the fabric will eventually be used for.

Roller Printing

This process is cheap to run, but has the following disadvantages:

1. The rollers are very expensive
2. The size of the pattern is limited to the circumference of the roller.
3. It can be difficult to print large patches of colour without blotches.

Rotary Screen Printing

This is the fastest and most widely used process. Modern machines can print over 300m of fabric per minute. A different colour is pumped into each cylinder and is forced out through a fine mesh screen onto the fabric passing below. The circumference of the roller determines the sizes of the design repeat. In industry, there are four main printing machine processes namely; roller printing, rotary screen printing, flat-bed screen printing and heat transfer.

2.5 Status of the Textile Industry in Uganda Prior to Liberalisation of the Economy

No study of the textile industry can be fully illuminating without considering the industry in the context of the country's overall economic structure. The purpose of this section is to view the textile industry before economic liberalization.

The textile industry in Uganda ranging from cotton growing to garment making, used to employ more than 500,000 people and earn more than US$100 million per year from the export of lint cotton alone. Based on the production of high quality cotton, the Ugandan Textile Industry was able to produce high standard textile fabrics and garment products. Products were exported to different African and Western countries. The textile industry, during the late fifties, laid the foundation for the manufacturing sector in Uganda.

The 1960s saw a prospering textile sub-sector. The number of cotton producers and the quality of cotton produced increased. Uganda was then a major cotton producer in Africa. After the expulsion (departure) of Asians in 1972, the whole industrial sector broke down. Jumire (1969), pointed out the need to make a revolution in the local textile industry so as to bring out a new and strong feeling towards the local textiles. A study of many samples of the local source of design in Uganda showed that particular significance was given to texture, something that played a very big part in enhancing the quality or rather the aesthetic value of design. He felt that Uganda should be encouraged to produce good and acceptable standards of home made design work that is consumable by local people and also to promote a good market abroad. Excessive consumption of foreign goods must be discouraged in aid of this.

A ban of imports would go a long way to ensure a steady market for the local goods. However standards even higher than those of the imported textiles should be aimed at by our manufactures. GoU had already done much in the way of innovation and ensured the industry's rapid and

healthy development. A number of textiles enterprises – large and small had sprung up here and there in the country and a few more were to follow.

He concluded that the future of textiles seemed clear. At its highest level, the designs would consist of a adaptations of the best traditional patterns, complemented and enhanced by a new work of inventive designers.

Mills and ginneries then owned by Asians were left without management and technical personnel after the nationalisation of enterprises, under the authority of National Textiles Board (NTB). Unfortunately, NBT did not have the capacity to adequately replace the former management which eventually led to the decline in the whole sub-sector (Terminal Project Report, November 1998). The economy almost came to the verge of collapse Government of Uganda (GoU) and cotton production became very unstable and unreliable (GoU) Quarterly Report, July – September, 1997).

According to the Feasibility Study Report of 1986-87, there were 8 large-scale textile firms except Uganda Fishnet Manufacturers Ltd and Uganda Bags and Hessian Mills Ltd. Most of them were mismanaged completely. The main business activity of the Ugandan Textile Industry was the production of cotton cloth and garments made mainly from natural fibres. Chemically compounded textiles were not at all produced due to the difficulty in procuring its materials and the problem of production facilities, all of them were imported (Cotton Sub-sector Development Project 1995).

Textiles, apparel, leather and footwear accounted for 9% of the total establishment and employed 17% of the labour force.

Between 1989-1993 average cloth consumption was as follows:

Domestic production	11 mlm
Imports of cloth	28 mlm
Imports of second-hand clothes	30 mlm
Total	69 mlm

It is clearly seen that the imports outweighed the domestic production. Projected demand for cloth (including second-hand clothes) in the year 1995-2000 was:

Year	Minimum (mlm)	Maximum mlm
1995	81	92
2000	95	118

Mlm: Million Linear Metres.

Source: **GoU Industrialisation Policy and Framework 1994-1999.**

2.5.1 Production of Textiles in Uganda

Most textile mills produced mainly cotton textile materials using cotton as their main raw material. The biggest plant of them all was Nyanza Textile Industries Limited, NYTIL. This plant had been for quite a long time a leader in quality and quantity in the production of textiles. The products of the company used to sell comparatively in Kenya and Tanzania during the good days of the East African Community. The products included dyed single, double and printed single fabrics, double bedsheets, dyed and printed Army uniform, mattress cover fabrics. In

fact, NYTIL was the first integrated spinning and weaving cotton textile mill in East Africa (Lutamu, 1987).

Lutamu (1987), continues to report that during the late 60s and early 70s, the textile mills in Uganda were producing at their best with a combined total average production of 46 million square metres. Until 1987, production fluctuated considerably due to problems that had affected the country. The production fluctuations are indicated below in years.

Name of plant	**Unit**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**
Uganda Rayon	'000'M²	862	1150	725	653	625	576
ATM		2136	863	715	721	523	383
MULCO		1066	2198	2216	994	777	750
NYTIL		14404	14422	12960	9171	8266	8,300

Source: The Textile Industry in Uganda – 1987.

According to current government rehabilitation and development plans, the textile industry is considered to be a priority area. The government has a number of measures to revive the industry so that production of textiles in Uganda is restored to about its level in the 70s. The following production levels were projected for the years 1988-1990.

Year	1988	1989	1990
Textiles '000'm²	24,344	33,133	45,060

Source: GoU Rehabilitation and Development Plan 1987/88-1990/91

A major programme during the period 1994-99 was the revival of the critical textile industry which would necessarily involve the promotion of cotton growing. Firms such as Nyanza Textile Limited (NYTIL), Uganda Spinning Mills (USM). African Mills (ATM) and United

Garment Industries Limited (UGIL) were either to be privatised or reconstructed with the view of increasing capacity utilisation, diversifying product ranges for both domestic and export markets; and improving the management and technical capabilities of the workers. Since 1993, textile firms such as African Textile Mills (ATM), NYTIL have been privately owned.

2.5.2 Raw Materials and Availability

Raw materials requirements are especially important in the fabric industry (Cooper, 1970). The main raw material used in the production of textiles in Uganda was cotton. The availability of large quantities in Uganda since the early 50s contributed heavily to the development of the cotton textile industries in the country. This in turn led to the development of associated industries which use the by-products of cotton such as the oil milling for vegetable oil and soap and animal feeds industries. During the early years of cotton production in Uganda, cotton had a second place in the earning of foreign exchange for the country after coffee. It was at the same time providing employment for a large number of people in the country. At peak level in the 1960s Uganda produced 467,000 bales. Cotton contributed significantly to the development of the textile industry. From 1970s onwards cotton production, however, declined rapidly reaching the lowest level of 11,000 bales of unit in 1987/88 (CDO, 1994).

With government efforts to stimulate production, it was expected that Uganda would regain its position as both a major producer and consumer of cotton and its products. When the factories were at their

best capacities i.e. about 46 million square metres, they required an average of about 50,000 bales of cotton. The production during 1994/95 was estimated at 70,000 bales. This was attributed to liberalisation.

Since 1994, the cotton industry in Uganda has been totally liberalised. All activities from primary export are wholly in the hands of the private sector. This followed the enactment, by parliament, of the cotton development statute, 1994, which established the Cotton Development Organisation (CDO), a body corporate, mandated to regulate, promote and represent the industry in all aspects.

According to CDO, the conducive liberalisation environment has led to general upward trend of production (with exception of ElNino season of 1997/98); increased stakeholder partcipation, leading to competition to the benefit of the farmer; increased processing capacity from 200,000 bales (1994/95) to 400,000 bales (1999/00), in 120 days; improved cotton quality and discovery of new lucrative markets.

The CDO noted the need to increase cotton productivity per unit area through lowering farmers, cost of production and ultimately ensuring maximum profitability. The organisation recommended that increased government support to the industry both at production and marketing levels be solicited. The organisation also notes that Uganda's cotton production potential rates over 1 million bales annually if appropriate technological packages are applied. There exists the necessary infrastructure to aid value addition to cotton to produce yarn and textiles. Capital injection would facilitate this development. Uganda

has competitive advantage to agronomic and climatic conditions for producing among the best cotton in the world.

2.5.3 Demand for Textiles in Uganda

Demand implies a combination of desire plus ability to pay. Demand may be defined as an amount of good or service that will be purchased at a specific price.

The consumption of locally produced and imported textiles in Uganda represented the demand for textiles in the country. The textiles consumed included cotton textiles, regenerated and synthetic textiles. Imported second-hand clothing constitutes an important segment of the total supply of garments in Uganda. These garments were purchased at prices significantly lower than new clothes. Therefore, second-hand clothes were a threat to the domestic textile industry (Lutamu, 1987).

Horn (1975), says that more forces from the consumers' environment can affect the patterns and levels of consumption for products such as clothing. Some of the most significant ones are; the changing state of the national economy, technological developments and socio-economic conditions. One of the forces that have greatly influenced the consumers' clothing selection and consumption patterns is the liberalised economy. Intelligent consumer choice is a fundamental problem for people in almost all modern societies but becomes an even more complex process in countries where textile goods are abundant and the number of alternatives increases each year.

2.6 Policies and Textile Industry

Policies are means by which objectives will be achieved. They include guidelines, rules and procedures established to support efforts to achieve stated objectives. Such rules would include payments of certain duties for inputs if production is for export.

It has been argued that programmes often fail to produce expected effects due to failure of policies guiding them. One of the reasons why policies fail is that the causes of the problems they address are so poorly understood that the solutions that they enact are themselves poor or even wrong. The following policies have been identified as important to the development of the textile industry.

2.6.1 Manpower Development and Employment Policies

Lack of explicit policies for manpower planning means that direct employment policies would be rather a problem. Uganda Manufacturers Association (UMA) recognises that human resource improvement is a key requirement for the success and prosperity of enterprises in a competitive market environment and that the future belongs to these enterprises ready to address demands of competitive market place.

2.6.2 Technology Development Policies

A systematic and co-ordinated textiles technology development policy is necessary. Industrial investments should be consciously

guided and scrutinised so as to enhance local technological capabilities. Industrial technology that is imported must be appropriate. Advanced countries' technologies are developed to suit the production systems, income levels and infrastructure of these countries. Their transfer to developing countries like Uganda without adaptation and transformation cannot but lead to structural distortions in the receiving countries' economies and societies. A diagnostic study of textile industry in Kenya showed that a lot of technology has been imported and although efficient, it is void of massive employment creation and therefore, inappropriate.

Massive transfer of technology, both as artefact and as information, has often been accompanied by misuse, misallocation, or misunderstanding in the recipient countries. It has been argued that sometimes technology choices are strongly influenced by bureaucratic objectives of decision-makers; and a heavy dependence on foreign aid, which had systematically led to inappropriate technology choices. Industrial technology measures should therefore include:

1. Selective acquisition of technology;
2. Effective use of all the channels of technology acquisition;
3. Effective government support for industrial research development
4. Identification for natural resources such as cotton.

2.6.3 Market Development Policies

Liberalisation results in increase of importation of textiles. Local manufacturers have, therefore, to compete with imports. Where there is limited domestic market, it becomes imperative to set in place a strong

export promotion programme. While import liberalisation can be beneficial to the consumer by forcing producers to put more emphasis on quality and pricing, caution may be required not to flood markets with imports that will stifle local production. It is only dynamic rational policies that can address such a caution. Uganda's private sector is in favour of trade liberalisation as a way of creating larger regional markets but believes that liberalisation should be deliberate, reciprocal, well co-ordinated and gradual.

2.6.4 The African Growth and Opportunity Act and Other Initiative and Requirements

The Act provides unprecedented opportunities and aims to:

1. Promote increased trade and investment between the United States and Sub-Saharan African countries by providing eligible countries with unprecedented liberal access to the U.S. market. Essentially, all products of these eligible countries will have quota free/duty free access to the almost 10 trillion dollar United States markets.
2. Promote economic development and reform in Sub-Saharan Africa, moving across a wide range of industries, granting tangible benefits to entrepreneurs, farmers and families.
3. Promote increased access and opportunities for U.S. investors.

The African Growth and Opportunity Act (2000) offers a wide variety of benefits to businesses, workers, manufacturers, and farmers in eligible countries. It is important to remember that the Act can only offer opportunities. African countries are encouraged to seize the

opportunities provided in the Act and to create enabling environments to strengthen prospects for expanded trade and investment.

2.6.5 Summary of the African Growth and Opportunity Act

The African Growth and Opportunity Act of 2000 authorizes a new U.S. trade and investment policy toward Africa. It promotes increased trade and economic co-operation between the United States and eligible Sub-Saharan African countries. This legislation represents a solid, meaningful and significant opportunity which could result in billions of dollars in new trade and investment flows between the U.S. and Africa.

General Trade Benefits

The Act:

1. Institutionalizes a process for strengthening U.S. relations with African countries and provides incentives for African countries to achieve political and economic reform and growth.
2. Offers beneficiary Sub-Saharan African countries duty-free and quota-free U.S. market access for essentially all products through the Generalised System of Preferences (GSP) programme.
3. Provides additional security for investors and traders in African countries by ensuring G.S.P. benefits for eight years.
4. Eliminates the G.S.P competitive needs limitation for African countries.
5. Establishes a U.S. Sub-Saharan Africa Trade and Economic Co-operation Forum to facilitate regular trade and market investment policy discussions.

6. Promotes the use of technical assistance to strengthen relationships between U.S. firms and firms in Sub-Saharan Africa.

Apparel and Textile Preferences

The Act

1. Lifts all existing quotas on textiles and apparel products from Sub-Saharan Africa (within 30 days of a U.S. Government determination that Kenya and Mauritius have adopted effective visa systems).
2. Extends duty/quota free U.S. market access for Sub-Saharan African apparel made from yarns and fabrics not available in the United States.
3. Extends duty/quota free treatment for apparel made in Africa from U.S. yarn and fabric and for knit-to-shape sweaters made in Africa from cashmere and some merino wools as well as apparel produced in Africa from silk, velvet, linen and other fabrics not produced in commercial quantities in the United States.
4. Extends duty free and quota free U.S. market for apparel made in Africa with African/regional fabric and yarn. Such imports, however, are subject to a cap (limit) ranging from 1.5 to 3.5% of the multibillion dollar U.S. apparel import market over an eight-year period. African apparel imports made with African fabric/yarns currently total about $250 million.
5. Provides an average of 17.5% duty free advantage on apparel imports in the U.S. market and promotes economic development and diversification in Africa's poorest countries with an annual GNP of under $1,500 ("lesser developed beneficiary countries") to use

third country fabric inputs for four years. This special investment incentive for the poorest African countries is aimed at providing a market stimulus to economic development for areas with little existing industry.

Uganda is one of the Sub-Saharan African countries designated as eligible for the benefits of AGOA as of October 2, 2000.

2.7 Quality Control in the Textile Manufacturing Industry

During the past decades, the recognition of the importance of quality in manufacturing industry has enormously increased (Heaton, 1996). Lester (1977) has reported that the increasing concern for customer protection and the emphasis on product reliability provide the impetus for management to create effective systems for control of quality in industry. Heaton (1996) confirms this when he reports that many companies have spent over £10 billion in putting in place a total quality management system and educating and training staff to be able to contribute to it and use it. What quality essentially boils down to is doing it right first time!

2.7.1 Quality

Tyler (1991) has defined quality as conformance to requirements. The requirements are directly set by the customer through the use of some form of specification. According to Lester (1977), the term quality serves to indicate the level of performance of the product. He explains that usually, the desired performance is measured in terms of specific

requirements. There is need for quality measurements of raw materials, incoming product, components and assemblies. He continues to say that without such measurements, it is impossible to make comparisons over time among various designs or raw materials, or to correlate field performance reports with product measurement. Tyler (1991) has added that failure to achieve conformance results in sub-standard product, waste and erosion of profit margins. Growth in quality and reliability of a product depends on a valid definition and measurement of important quality parameters.

2.7.2 Quality Control

The term quality control refers to a system within a manufacturing plant by which assurance is sought that the output produced conforms to specific parameters that define product or service quality (Lester et al 1977). According to Barnett (1977), quality control involves the use of checking procedures at every stage of development to make sure the product will meet specification. Checking for quality involves the production and use of clear instructions and criteria for every stage, and testing and inspecting to make sure the required standards of quality are being met.

Quality control operates in each of the following stages; market research, design; fabric specification; manufacturing specification; management of production; meeting standards; inspection and checks (Barnett, 1997).

2.7.3 Quality Control Procedures

The extent of quality control procedures engaged in by a particular firm depends on the extent to which quality is a source of greater profit or incentive as well as the characteristics of the firm and those of the employers. These include the skill of managers and workers, the quality of inputs and the quality and maintenance of equipment (Lester, 1977). Coughlin (1986), adds that managing directors must have adequate business acumen and background. They must take the right decision.

The degree of exposure a manufacturer has had to international quality norms and standards also influences the intensity of work effort towards quality control. Also as firms increase in size and the range of the products is diversified, there may be need for extensive quality control procedures and a large quality department.

In a typical manufacturing firm, the production manager and the quality control manager work together to supervise the production of textiles through all processes to ensure that quality standards are maintained. They both have specific roles in the manufacturing firms but must co-ordinate these to maintain the quality standards (Cooklin, 1991).

2.7.4 The Role of Various Departments in Quality Control

In a textile manufacturing firm, each department and production process is important in determining and maintaining the quality of products. This was stated by Lester et al 1997 and Chutter, 1988).

The sales and marketing departments carry out market research to facilitate the design of fabric and garments in styles/fashion, colours, sizes and prices that meet the consumers' expectations. The design department ensures that the product has no weak points. It also ensures that the pattern sizing system conforms to the typical body measurement of the consumers targeted (Cooklin, 1991). The fabric sewing notions should be suitable for the design and able to withstand reasonable laundry and use. Lester et al, (1977) advise that at all the stages of production, specifications should be used as a guide to acceptable standards for raw materials and processes used. Random samples should be inspected at all the stages to detect problems and correct them to meet specification (Lester et al, 1977).

2.7.5 Qualities of a Quality Control Manager

Guerreiro (1987) outlines certain qualities that a Quality control manager should have to help assure effectiveness. They include the ability to sell ideas effectively, at all levels of the organisation, orally and by written communications; a broad work background in research, engineering and production; sufficient understanding of marketing, sales and finance functions to effectively integrate quality control work with all of the firm's needs; performance mindedness and freedom from bias, whether it be in the direction of sales orientation or production quantity preference.

2.7.6 The Role of the Production Manager (PM) in Quality Control

The PM is concerned with the organisation of the use of the equipment and other resources such as men, materials and money (Lockyer, 1983). He should have personal qualities of high organisational ability, interest in keeping up-to-date relevant technological advances and ability to work in stressful conditions.

A study conducted by Oigo (2000) on training needs of quality control and production managers in clothing industries in Nairobi showed that all the managers combined the roles of quality control manager and production manager. It is noted that most of their duties centred around production management. Most of the managers did not feel the need for additional training in managerial skills. They, however, pointed out managerial problems arising from combining the roles of quality control manager and production manager, which over worked them and reduced their effectiveness. On the basis of the findings, she made recommendations to the manufacturers to reduce the workload of their managers to take a more active role in purchasing high quality inputs.

The characteristics of the firm in which the textiles are manufactured and competencies of the quality control and production managers influence the quantity and quality of the textiles produced. Lockyer (1983) adds that success of a company depends on the relationship between marketing and production functions.

2.7.7 Quality Characteristics

The quality of a fabric design requires a high level of market research. One of the main objectives of market research must be to establish what is the ultimate customer's preference, at an acceptable price, amongst a competing set of characteristics. These can then form the basis for the design. Customers may demand the various combinations of the following, in various orders:

(1) Price and apparent value of money

(2) Individual appearance

(3) Durability of appearances

(4) Physiological qualities (water proofing, warmth, sweat absorption etc.

(5) Ease of care (crease and stain resistance, shape retention, washability e.t.c).

(6) Consistency of product

On the other hand, the production man can do little about many of the quality characteristics except to stick to the specifications. He is more concerned with the needs of the retailers, which are consistency, delivery, on time and low cost to support the competitive price.

According to Chuter (1988) if good quality is not designed into a fabric it will not possess it. In it particular features should be incorporated, which make the maximum use of automatic machinery wherever possible. Designers must be aware of the natural quality level of the factory.

2.7.8 Textile Testing and Standards

To determine whether textile products meet establishment standards, such products must be tested. Textile standards and textile testing are therefore closely involved (Nyangor, 1994).

Testing

Established testing methods have validity and are accepted by authorities in the field as reliable. Not only do industry and the government require testing of materials in ways that are acceptable as reliable and standardized, but researchers also require a body of accepted tests for use in comparing data accumulated by different researchers working in different laboratories. Testing equipment must conform to the specifications established in the testing methodology and fabric specimens must be of uniform size.

Equipment for Testing

There is the pick counter used to facilitate counting threads per inch or wales and courses of knitted goods. The tensile tester is used for testing tensile strength of fabrics and cords. Many tensile machines can be adopted to perform tearing and bursting strength tests. The Random Tumble Pilling Tester is for determining pilling characteristics for all types of fabrics. The Fade-o-metre is for determining colour fastness to sunlight.

Government agencies, textile product manufacturers, retailers and consumer groups may all become involved in the establishment of

standard specifications for textile products. A standard specification is a defined level of performance that a product must achieve to be considered as acceptable for use (Tortora 1987). Some retailers for example, require that wholesale manufacturers from whom they buy must produce goods that meet specifications. Other agencies require that carpets, draperies and the like conform to stated specifications. Standard specifications also provide a basis for the comparison of results of studies of textiles by different researchers.

2.7.9 Organisations that Establish Standards

There must be an organisation that is involved in establishing standards. It should test methods and specifications. Activities relating to the setting of standards are not limited to a country. For example, international organisation for standardisation (ISO). In Kenya, standards that regulate construction and labeling of textiles have been drawn up by the Kenya Bureau of Standards (KBS) and representatives of the textile manufacturing and retailers (Oigo, 2000). The manufacturers may use the KBS specifications or those given by individual clients who have placed order. The specification must be correctly interpreted in order to maintain quality.

2.8 Modern Technology in the Textile Industry

The demand for new products and for the technology to produce those products provides a ready incentive for trade. In some cases, the new technology provides efficiencies that give a competitive advantage over prior processes in both price and response time. A major textile

development of recent decades was the refinement and mass production of manufactured fibres.

Markert (1989) defines appropriate technology as one that fits the cultural situation for which it is proposed without causing more problems than it solves. Appropriate technology is also an attitude regarding an over-reliance on high technology.

2.8.1 Computer-Aided Design

It is facilitated by the following programmes:

1. **Computer Integrated Manufacturing (CIM)**

   This is the umbrella acronym for a host of automation technologies in the manufacturing environment. It does not refer to one specific technology, but to the integrated use of computers in all sections of enterprises, from the planning of production, through the design and manufacture of a product, up to the assurance of goods quality.

2. **Computer aided Manufacturing (CAM)**

   This system aids in production of fabrics through use of electronic equipment for monitoring operations, equipment for controlling specific operations and equipment that diagnoses and corrects problems.

3. **Textile/Clothing Technology Corporation**

   The purpose of this system is to conduct research about application of electronic technology in textile industries and to educate executives, engineers, technologists and educators about automated systems, their potential and use.

2.8.2 Advantages of Modern Technology

Modern technology in form of multi-purpose machinery such as the computer and its systems are faster and therefore speed up productivity. Computer-generated designs facilitate faster transfer of designs for successive stages of fabric formation. The computer can store information which can be recalled for use in the future instead of beginning again. For example, basic designs can be recalled for adaptation to new designs. Some designers find that computer-aided designs stimulate design ideas.

2.8.3 Disadvantages of Modern Technology

Investing in labour-saving machinery is very expensive thus limited to large textile firms. There are complaints that by relying too much on computer programmes some designers no longer understand technology especially for knitted fabrics. Power rationing that is common in developing countries can wipe out computer memory. However, adoption of modern technology is necessary in order to compete with other producers within the industry.

2.9 Problems Encountered in the Textile Industry

Werbeloff (1987) noted that unsatisfactory project planning and implementation resulted in costly infant-industry protection, under utilisation capacity, low productivity and shortages of foreign exchange to pay for imported machinery, spare parts and skills.

Analyses carried out by the World Bank identified problems of political instability and civil wars; inadequate transport, communication, education and training facilities; low productivity and uncompetitive industries. Further, there are severe problems in the amassing of comparable, reliable, up-to-date and comprehensive data for Africa.

Capacity utilisation is a problem mainly due to lack of enough raw materials. Old technologies which lead to considerable labour inputs and maintenance costs thus high production costs. Diversity of imported technologies is also a problem in the textile industry. Poor roads and feeder roads are another problem encountered in the textile industry. Frequent power cuts interfere with the smooth operations of textile industry.

It is important to note that Uganda's textile industry is no exception. For example a Capital Asset Evaluation carried out in 1992 on African Textile Mills (ATM) cited a fall in capacity due to uprooted machinery and outmoded equipment, low productivity, problems of power supply between Tororo and Mbale during rainy seasons.

The manufacturer (March 2000) identified high cost of finance, high interest rates, smuggling together with damping of counterfeit products as key constraints to growth in the private sector. Oigo (2000) identified problems related to the following aspects in clothing firms in Nairobi:

Managerial Problems

These were problems that managers associated with doing both production management and quality control jobs and those related to other managerial duties. The most common problem cited was overwork

and exhaustion due to many responsibilities. There was also the problem of poor work by the supervisors and machine operators which called for constant supervision and training of machine operators.

Absenteeism by workers resulted in lowered production. The solution was to have standby workers and training them to take over from those who were away. Further training of junior staff was also seen as a solution to communication problems encountered in management.

Problems Related to Firm Characteristics

These were problems related to firm size, range of garments, output and garment assembly systems. The most common problem was large orders to be filled in a short time. Oigo (2000) noted the fluctuations in work volume which caused some firms to keep employees on casual terms for many years to avoid paying them when workloads were too low. The most common problem related to the range of garments produced was difficulty in dealing with complex designs. All the thirteen firms studied had problems associated with manual transportation of products between machine operators.

Problems Related to Quality

Oigo's study indicated that the largest number of problems identified were those related to quality. The most common problems were shrinkage and colour loss of fabric. This is a serious problem because it has cost clothing manufacturers valuable Kenyan garment consumers (Otieno 1990 and Nyang'or 1994).

Problems Related to Liberalisation of the Economy

Nine firms in Nairobi experienced problems arising from economic liberalisation. The greatest problem was low-priced imports that were a source of unfair competition. It was also noted that liberalisation had a negative impact on job security and creation.

Policy and Economic Problems

These problems arose from the drought experienced from mid 1996 to early 1997. The following three effects of drought created serious problems in the operations of the firms. The first problem was low water supply which led to the use of borehole water that resulted in strains when processing fabric for dyeing and poor dye uptake. The second problem was power rationing which became necessary, resulting in low production and efficiency. The third effect of drought was reduced demand for new clothing outstanding resulting from lowered consumer purchasing power since food prices were very high. Among the economic problems identified were competition from local manufactureres and the challenge of maintaining and attracting investors to the clothing industry.

According to Oigo (2000), these problems are significant because over the past few years the industry has declined due to the reduction of the protection it enjoyed prior to liberalisation. These problems also affected inputs (especially cotton) and availability of credit, both of which were crucial to new investors in this sector. Vat (Value Added Tax) on final products also had a negative impact on the industry by making goods too expensive for customers. All of these problems required policy

changes to revive the industry and ensure its strengthening so it could contribute fully to the industrial development of the nation.

The above mentioned problems were identified by Oigo's study in clothing firms in Nairobi. Her study did not include composite textile firms. The current study has filled this gap

Muteti (2001), identified health problems experienced by working women in industrial occupations, in selected industries in Nairobi. The industries studied included textile firms. The conditions and factors within the work environment largely influenced the health conditions of the women employees. It was also observed that women working in the industrial occupations experienced various health problems, which included stress, headache, chestpain, backpain, throat infections and injuries. It was further observed that working conditions and environment influenced the experienced health problems. It is noted that the textile industry was found to be characterised by high incidences of health problems and strenuous working conditions as compared to pharmaceutical and food processing industries. additionally, it was observed that policy initiatives and management practices were not adequate for the improvement of health conditions of the women employees.

The study concluded that existing industrial policies have not been effectively enforced, and particularly in the textile industry. Additional industrial policies and regulations were required in order to alleviate the health problems experienced by women working in the industrial sector. There was need for practical adoption and strict enforcement of policies

and management practices that encouraged fair working conditions and hazard-free work environment.

The above study concentrated on health problems in relation to women. It does not address the health problems faced by men working in textile industries. The current study fills this gap.

Otieno, (2001), investigated occupational accidents among factory workers in Badadogo industrial area in Nairobi. The investigation revealed that up to 47.2% of the workers had had occupational accidents in the previous twelve months under study. It was also noted that there was a strong association between the causes of accidents and occupations with handling objects being responsible for 39.6% of all accidents. Accident rates also shown to vary with experience; with most accidents occurring in those who had worked for 5 years or less. Most accidents affected the machine operators.

The study revealed that handling objects; hand tools and power driven machinery caused most accidents. Much attention was to be therefore focused towards these causes in order to reduce accidents. It was further noted that machine operators had higher rate injuries compared to other occupations hence much attention was to be focused on training and improvement of production on machinery in order to reduce accidents.

Housekeeping standards, safety standards, chemical and physical hazards level were shown to be significant factors, hence much attention was to be focused work environment as this could reduce the number of accidents.

2.10 Career Opportunities in the Textile Industry

Tortora (1987) says that a wide variety of employment opportunities exist in this field. She outlines the following as some of the textile careers:

- Business management in textile fibre, fabric, finishing, garment and retail segments of the industry.
- Textile chemistry in the manufacturing of fibres, research and development and finishing.
- Textile technology applied in manufacturing fibres, yarns and fabrics. It is necessary for research and development of new techniques for manufacturing fibres, yarns and fabrics. It also involves developing new machinery for garment manufacture. Textile technology is required in the application of dyes and finishes.
- Marketing of fibres, yarns, fabrics and finished products of textile machinery and equipment.
- Education through industry, trade organistions technical schools, colleges and universities.

The above mentioned career opportunities require knowledge of textile and fashion, combined with personal qualities such as being well-organised, flexible, fashionable and neat in appearance, creative, able to follow instructions, and having interpersonal skills.

2.11 Textile Information Sources

To keep customers well-informed about textile products, textile manufacturers have an obligation to communicate to customers through various channels as an aid to textile decision making and selection.

Such communication is used to disseminate information to consumers about the location or shopping outlets of certain textile items, their prices and functional characteristics.

Solomon (1985) classifies such channels as "peron-dominated" and "marketeer-dominated". The marketeer-dominated channels include magazines, books, newspapers, catalogues, sales persons in textile stores and displays.

These sources of information may have a positive or negative influence on the consumer's decision making depending on how the consumer perceives their credibility or honesty. Textile producers or dealers therefore need to be cautious about how they channel information to the consumers as consumers tend to rely on this information for decision-making in selection of textiles.

2.11.1 Shopping Outlets

These are locations from which fabrics or textile items are purchased. Textiles outlets are available in various forms, and the kind of outlet a consumer chooses to go to may be influenced by the time available for shopping, the price and value of merchandise at the outlet, the kind of sales people, the outlet's reputation or reliability. In Kenya for example, outlets used for clothing include boutiques, variety stores, speciality stores, open air markets and door-to-door clothing sales.

2.11.2 Labels or Information Tags

These are information tags attached to textile products intended to provide information about the product upon which it is attached. Labels

state the performance characteristics of the fabric item such as crease and shrink resistance, colour fast to washing, sunlight, perspiration, pressing and many others as enhanced by the finishing processes at the industries. They give care instructions for the item like the washing, drying and ironing instructions and give the content of the given item. Labels also hold details such as producer's name or brand name, place of origin and many others (Otieno 1990).

In cases where textile items bear no labels, consumers have often been cheated of their money since they have purchased unlabelled products that have behaved contrary to the consumer's expectations. In countries such as the United States of America (U.S.A) where there is effective Textile Product Act, consumers have been saved from deceptive practices by textile manufacturers and sellers. This Act has since enforced a rule that requires all textile products to have a permanently legible care label affixed to the product for its entire useful life. The labels have also had to provide as detailed information as possible. The Act for instance requires that fibre content in products be labelled by percentage and in order of predominance by the weight of each fibre in the fabric, for example 30% rayon, 65% wool (Otieno 1990). With such detailed information, the consumer is able to estimate not only the maintenance demands of the given item, but also is able to predict the items' performance in use, as well as its comfort qualities.

2.12 Summary of the Literature Review.

A brief history has been given so as to understand the structure of the present textile industry. Scope and characteristics of the textile industry

have been discussed to cover production methods used, employment, contribution to the economy, types of firms and range of products. A brief review of the textile industry in developing countries was also done to establish the situation there. The status of Uganda textile industry before liberalisation was also reviewed. Policies on market, employment and Africa growth and Opportunity Act (AGOA) were reviewed. Literature on quality control has been presented to include roles played by different departments, quality characteristics, textile testing standards and organisations that test standards. Modern Technology in the textile industry, problems facing the textile industry were also discussed and career opportunities in the textile industry have been outlined, and last but not least, textile information sources.

CHAPTER THREE

METHODOLOGY

3.1 Research Design

The main purpose of this study was to explore the status of the textile industry in the context of Ugandan liberalised economy. It was necessary to select a methodology that would allow for in-depth understanding of the situation. Qualitative and quantitative methods were seen as most appropriate to achieve the objectives of the study. The study was exploratory because not much research has been done in this area of the textile industry. A collective case study approach was used to conduct an in-depth investigation of the composite textile firms in Uganda. The primary purpose of a case study is to determine factors and relationships among the factors that have resulted in the situation under study. The investigation therefore made a detailed investigation of the selected firms. A case study approach was appropriate because it enabled the researcher to conduct an in-depth study of the selected individual textile firms in order to establish the status in relation to inputs, outputs and production processes.

3.2 Study Location

The study was conducted in the Eastern and Central parts of Uganda where the selected textile firms are located, though separated by geographical distance. These firms carry out a variety of activities including spinning, weaving, finishing and marketing of textile products.

3.3 Sample Selection of Textile Firms

The three composite textile firms purposively selected. Purposive sampling is a technique that allows a researcher to use cases that have the required information with respect to the objectives of the study (Mugenda and Mugenda 1999). Purposive sampling is a type of non-probability sampling method in which the researcher uses his or her own judgement in the selection of sample objects.

The selection of the three textile firms was based on the criteria that they are the only composite firms existing in the country and are operating on a large-scale basis. Such firms carry out several manufacturing processes such as spinning, weaving, finishing and packaging of textiles for the market.

The three firms were the units of analysis. The managers, supervisors and machine operators formed units of observation. Mugenda and Mugenda (1999) point out that in studies dealing with composite units such as textile industries, the information required is obtained from an individual person such as the manager but the results obtained from the analysis of such data relate to the composite unit. For this study therefore, the necessary information was obtained from six managers in charge of production and marketing, ten departmental supervisors and 64 machine operators. A total of 80 respondents (personnel) participated in the interviews.

3.4 Development of Research Instruments

Data were collected using two instruments, namely interview schedules, and an observation checklist.

Interview Schedule

The interview schedule was appropriate because it enabled the researcher to obtain deeper information using probing questions. Very sensitive and personal information was extracted from the respondents by honest and personal interaction between them and the researcher.

For this study, the researcher used a semi-structured interview schedules. The interview schedule was used to obtain information from managers, supervisors and machine operators of the selected textile firms. Production managers and supervisors were asked questions related to inputs, outputs, production processes, quality control while marketing managers were interviewed in relation to marketing procedures. All the above groups of respondents were asked to enumerate the problems they are meeting in connection with their work.

The Observation Checklist

The list of important processes was compiled. The list enabled the researcher to record and describe the processes. This instrument was used to record various stages in production and products of each firm. Where possible photographs of the processes, machinery and products were taken to confirm the processes and strengthen the description. Direct observation enabled the researcher to describe the processes and

identify any modern technology. This information was also used to supplement the verbal statements made by the respondents.

3.5 Validity of the Instruments

The validity of the research instruments was increased by repeated reviews by expert researchers and specialists in textiles. Managers not included in the study also validated the instruments.

3.6 Data Collection Procedures

The researcher personally interviewed the selected respondents at the firms. This also enabled the researcher to identify the modern technology, processes and products in the selected firms. Interviews were held with the respective managers, supervisors and machine operators at the firms.

During the interviews, the responses were recorded by note taking only. The researcher observed the machinery and steps in textiles processing and checked off the operations as they occurred. Photographs of the processes, machinery and products were taken by a competent photographer. All the discussions held during the interview were properly coded.

3.7 Operational Definitions of Variables

1. **Range of product:** Specific textile items made by the firm.
2. **Firm size:** The total number of people working in the firm (50 or more employees)
3. **Daily output:** The number of metres of fabric that each worker makes each day on average.
4. **Sources of raw materials:** Locally obtained or imported by the firms.
5. **Processes in fabric production:** Spinning, weaving and finishing of textile fabrics.
6. **Quality control** – Procedures concerned with the planning and ensuring production of high quality textiles (Cooklin 1991).
7. **Firm characteristics** – Classification of a manufacturing establishment according to size, range of textile products, target market and capacity of output.

3.8 Data Analysis

The qualitative data were coded and grouped in categories developed. Categories were developed from data obtained on problems identified in the selected firms. For example problems raised by managers and supervisors in relation to the rest of the workers were categorised as labour related (these included absenteeism, lack of motivation, laziness etc). Health related problems formed another category. Raw materials, processes and products formed other categories. The categories were then merged to from broader categories. Data were presented and discussed in descriptive form. Data obtained by use of checklist was used to describe textile production processes and the machines used. Relevant photographs and flowcharts were used to

accompany various processes and machines. Quantitative data obtained on characteristics of supervisors and machine operators; characteristics of firms were summarised using frequencies and percentages.

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

The purpose of this study was to investigate the status of the Uganda textile industry in a liberalised economy. To achieve this, data were collected from managers, supervisors and machine operators using interview schedules. An observation checklist was also used to obtain data on production processes, technology and the kind of textile products made in the selected firms. The results are presented in this chapter under the following sub-headings according to the objectives in chapter one:

1. To determine the demographic characteristics of the respondents in the selected firms.
2. To establish the sources and cost of raw materials used in the firms
3. To establish the characteristics of the selected textile firms.
4. To identify the production processes used in the selected firms
5. To identify the marketing activities done in the selected firms
6. To establish the role of Uganda government in promoting the textile industry
7. To identify the constraints facing the textile industry

4.2 Demographic Characteristics of the Respondents

The first objective was to determine the characteristics of the respondents in the selected firms. The demographic characteristics investigated included title of job, work experience, education background, gender, marital status and age. Six managers, ten supervisors and 64 machine operators participated in the study. Characteristics of each group has been presented and discussed separately. A total of 80 personnel constituted this study.

4.2.1 Characteristics of the Managers.

The managers fell in the age range of 28 - 50 years, five were married and one was single. It was noted that the number of years that these managers held their posts in the firms ranged from eleven months to six years. The four to six years of work experience indicated that the managers were conversant with their responsibilities in the textile industry. Their managerial skills seem to have been enhanced by extensive years of experience. Oigo (2000) observed that the years of previous experience and duration at current jobs indicated a large proportion of the managers who were quite conversant with their responsibilities in the clothing firms in Nairobi. Experience is therefore an important factor in improving the status of the textile industry.

It is also noted that all the managers had received formal education ranging from four with diploma to two with university degrees. The educational level of the managers is very significant because it prepares them for their responsibilities in the textile industry. Their

skills and experience were relevant to their duties. Oigo (2000) cited eleven (11) managers who had a good training background in textiles and clothing design in Nairobi firms.

Responses indicated that all the managers were conversant with the critical areas of inputs, processes, personnel management and marketing activities. All the six managers had received additional formal pre-service training after school.

Education is important because it equips the managers with the awareness about the requirements and market conditions in the textile sector which in turn influences business practices such as Customer Service, Labour Relations, Quality Control as well as financial and accounting procedures. This in turn improves the status of the textile industry.

4.2.2 Characteristics of Supervisors

Ten departmental supervisors were interviewed. Six were from firm A; one from firm B and three from firm C. These were in charge of spinning, weaving, processing and garment departments. The characteristics investigated included work experiences, levels of education, professional qualifications, gender, marital status and age.

4.2.2.1 Work Experience of the Supervisors

Respondents were asked to state how long they had worked in the selected firms. According to the data collected, the duration of work experience ranged from 48 days to 22 years. Majority (6) had worked for two years and above, only 4 had job experience of less than one year. It was noted that one supervisor with work experience of 2 years and 2 months had previously worked in the textile industry for 26 years before joining this particular firm as supervisor. The one who had worked for two years as supervisor had previous work experience of 20 years as a mechanic in spinning department. One old-timer was cited with work experience of 22 years as supervisor.

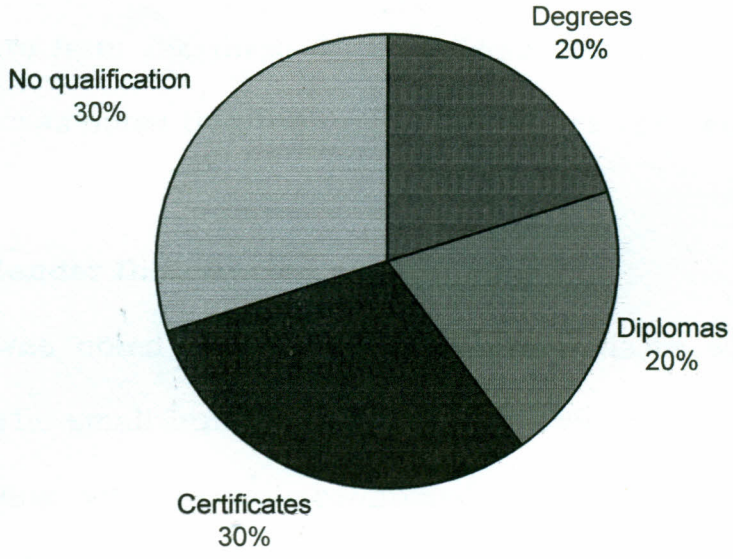
4.2.2.2 Level of Formal Education

Education of supervisors in the selected firms was investigated. It was observed that 8 of the respondents attained post secondary education. That means they attended college or university. The 2 did not go beyond secondary level but at least had some basic education. Good education of supervisors is important because it improves the status of the textile industry.

4.2.2.3: Professional Qualifications of the Supervisors

Professional qualifications of the supervisors investigated are presented in figure 1.

Figure 1: Professional Qualification of Supervisors



Qualifications of the supervisors ranged from certificates to degrees. 30% of the respondents had certificates relevant to their jobs which included technical, electronic engineering and textile technology. 20% had diplomas in the electrical engineering and tailoring respectively. Two supervisors (20%) had degrees. One was a Bachelor of Science degree in engineering while the other was a B.Sc. degree in microbiology. It was noted that 3 supervisors did not have qualification but had received on-the-job training by the firms. It is important to have well

trained and qualified supervisors because their work influence the status of the textile industry.

4.2.2.4 Marital Status of the Supervisors

The respondents were asked to specify their marital status. Marital status was considered because entry into marriage brings with it certain responsibilities and expectations in any society. In a sample of supervisors from the three selected firms, 8 were married and 2 were single. It was noted that the single supervisors were women.

4.2.2.5 Gender Distribution of Supervisors

It was noted that 8 were male supervisors while only 2 were female. The small number of female supervisors in the selected textile firms in line with research conducted by Muteti (2001). He observed that a small number (23%) of working women in the textile industries in Nairobi are in primary workforce and perform duties which include supervision and quality control. Although the textile industry in Kenya is the second largest employer of women, very few of them occupy supervisory posts(Oigo 2000). From the results it is observed that there is no difference between Kenya and Uganda in gender employment in the textile industry.

4.2.2.6 Age of the Respondent Supervisors

The supervisors varied in age. Majority (8) were in the age range of 25-39 years. This is the most productive age in terms of work. One supervisor was 42 years and one was 52 years old.

From the above descriptions it was noted that majority (6) of the supervisors had good work experience. A good number also had sound educational background and training relevant to their duties. Many years of work experience indicated that the supervisors were conversant with their duties in the firm. Their supervisory skills seem to have been enhanced by extensive years of experience. Experience, education and good training are important factors in improving the status of the textile industry. Responses indicated that most of the supervisors were knowledgeable in the critical areas of raw materials, processes, quality control and products.

4.2.3 Characteristics of Machine Operators

The last group of respondents was machine operators. The table below shows sample of respondent operators from selected firms.

Table 1: Sample of Respondent Machine Operators

Sample	Number (N)	Percentage (%)
Firm A	35	54.7
Firm B	15	23.4
Firm C	14	21.9
Total	64	100.0

As indicated in Table 1, the percentage representation of each firm shows that firm A with 54.7% had the highest number of machine operators followed by firm B with 23.4% and finally firm C with 21.9%.

This is expected because firm A is the largest of all and operates a double shift. The other two run single shifts. The important variable investigated were work experience, level of education, qualifications, marital status, gender and age.

4.2.3.1 Work experience of Machine Operators

The respondents were asked to state how long they had worked in the specified firms. Information provided is summarised in Table 6

Table 2: Work Experience of Machine Operators

Years/Months	Number (N)	Percentage (%)
1½ - 11½ months	13	20.3
1-3 years	10	15.6
4-6 years	28	43.7
8-10 years	4	6.3
11-14 years	4	6.3
Over 15 years	5	7.8
Total	64	100.0

According to table 2, majority (37) had worked for over 4 years. Those who had worked for less than a year (13) were cited in a firm that had opened a year before this study was conducted. Machine operators who had worked for over 4 years had experience which made them conversant with their jobs. Most of them were technicians, mechanics and tailors by training.

4.2.3.2 Level of Education of Machine Operators

Education of machine operators in the 3 selected firms was investigated. Results are presented in Table 3.

Table 3: Education of Machine Operators

Level	Number (N)	Percentage (%)
Secondary	25	39
Post secondary	38	59
KAPE	1	2
Total	64	100

As indicated in Table 3, majority 59% (fifty nine percent) had post secondary education and 39% (thirty nine percent) had some secondary education. It is important to note that all the machine operators had some form of basic education. Education is important because it enhances the status of the textile industry.

4.2.3.2 Professional Qualification of Machine Operators

Professional qualification of the operators ranged from certificates to diplomas. These are presented in Table 4.

Table 4: Professional qualification of Machine Operators

Qualification	Number (N)	Percentage (%)
Certificates	37	57.8
Diplomas	5	7.8
No qualification	22	34.4
Total	64	100

Table 4 indicates that 37 (57.8%) operators had certificates while the other 5 (7.8%) had diplomas. The certificates were in tailoring, craftsmanship, electrical and mechanical engineering, textile arts, plumbing, law and order. Diplomas were in tailoring and engineering. Professional training is important because it equips the operators with skills and knowledge required for their job. However, 22 operators did not have any form of qualification. It was noted that all the machine operators had received on-the-job training because the machines were strange to them at the time of joining the firms.

4.2.3.3 Marital Status of Machine Operators

Marital status of the respondents was investigated and data is presented in Table 5.

Table 5: Marital Status of Machine Operators

Status	Number (N)	Percentage (%)
Married	49	76.7
Single	14	21.8
Widowed	1	1.5
Total	64	100.0

Table 5 indicates majority (76.7%) of the operators were married. Only 21.8% were single. It was noted that one (1.5%) operator was widowed. Married men tend to seek employment to meet the needs of their families.

4.2.3.4 Gender Distribution

Gender distribution of respondent machine operators is indicated in Table 6

Table 6: Gender Distribution of Machine Operators

Gender	Number (N)	Percentage (%)
Male	35	54.7
Female	29	45.3
Total	64	100.0

From table 6, it is observed that 54.7% were male operators while 45.3% were female. It clearly indicates that there are more male machine operators than female in the selected textile firms. During the study the researcher observed that there were very few women operators in spinning and weaving departments. Most of them were cited in packaging and garment departments. Muteti (2001) also observed that there were more women employees in activities involving packaging, checking and tailoring than in supervisory posts in Nairobi's textile firms.

Long work experience, sound educational and training backgrounds of the machine operators seem to have enhanced the status of the textile industry. This was observed when the researcher toured the departments in charge of spinning, weaving, knitting, finishing and packaging. Most of the operators performed their duties efficiently and with confidence. However, the operators may need more in-service training to cope with the fast changing technology in the textile industry.

4.2.3.5 Age of Machine Operators

The operators varied in age. Their age ranges are summarised in Table 7.

Table 7: Age of Machine Operators

Age Range (Years)	Number (N)	Percentage (%)
22-29	38	59.3
30-39	16	26.0
40-49	4	6.3
50-60	6	9.4
Total		**100.0**

Majority (59.3%) fell in the age range of 22-29 years while twenty six percent (26%) were between 30-39 years. It is important to note that most of the operators were aged between 22 and 39 years. This is the most productive age group and if properly managed productivity is likely to increase. This will in turn boost the status of the textile industry.

However, form this study it is worth noting that biggest number (55) of machine operators were aged between 22 and 39 years. This s not surprising because during these ages people are still young and strong. The nature of the work and machinery used in the textile manufacturing industry requires strong and perhaps young employees. In my view, age could be considered an important factor in employment.

It was also noted that machines in spinning, weaving, knitting and processing were handled by mainly male operators though some women were cited. This is not surprising because these were heavy machines requiring strong men to operate them. On the contrary more women than men were cited in the tailoring/garment sections.

4.3 Raw Materials and other Inputs

The second objective of this study was to establish the sources of raw materials used in the selected textile firms. During the visits to the firms, the following main raw materials were observed:

4.3.1 Cotton

Cotton is available locally. It is obtained directly from the ginners on cash basis. The ginners buy this cotton directly from the farmers in Uganda (See Appendix 7). This is possible because of liberalisation of cotton growing. However, some of the cotton is imported. The cost of the lint cotton ranges from UG Shs, 1000/= to 2,200/= per kilogram.

One respondent remarked, this is not a fair price for the firm because it is relatively high. This affects the profits of the firms.

This implies that the products are to be sold at a high price. There is need for Cotton Development organisation (CDO) to come up with a policy on the price of cotton in the country.

4.3.2 Minimatt and Polyester Fibres

These fibres are imported from Far East because Uganda does not manufacture them. They are used to make polyester and polyester blended fabrics. The importation of these fibres raises the costs of production because the firms have to pay taxes.

4.3.3 Dyes and Chemicals

These are imported from India because the country does not manufacture them. The main types are:

Reactive, Pigment, Vat, Sulphur, Napthol, Direct and Disperse dyes. These dyestuffs are expensive and are not below UGshs 40,000/= per kilogramme. Other chemicals include salt and caustic soda which are also imported. This implies that the fabrics produced will be sold expensively to cover the costs incurred. Possiblities of manufacturing dyes and chemicals within the country should be explored.

4.3.4 Packing Materials

Most of the packing material is sourced locally. For example, polythene is made by Picfare Industries in Uganda. The Polyester/Polythene with (PP) is also obtained from Kampala. It is obtained in large quantities from the manufacturers.

From the results presented, it is noted that the major fibre used in the textile industry is cotton which is grown locally in Uganda. The liberalisation of the economy enables the textile firms to purchase the cotton directly from the ginners at the price mentioned above.

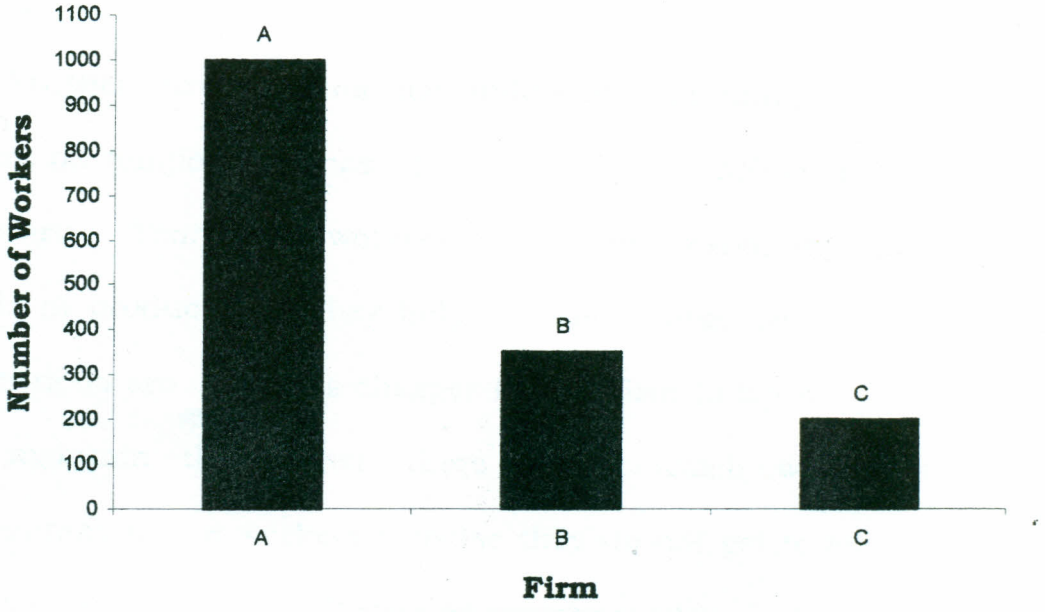
4.4 Characteristics of the Firms

The third objective was to establish the characteristics of the selected firms. The characteristics of the firms investigated included size of the workforce, range of products and markets targets.

4.4.1 Size of the Work Force in 2001

Data on the number of employees were obtained for the year 2001 for the three firms as shown in Figure 2.

Figure 2: Total Number of Workers in 2001 by Firm



In 2001, the number of staff in firm A was 1,000 compared to 1,180 in the previous year. This indicated a decrease in number of employees by 180. The decrease in numbers was attributed to the fact that some employees left the firm in search for greener pastures in other fields, while migrant workers especially from Northern Uganda did not return on completing their leave. One manager mentioned that such workers look for alternative employment. Research has shown that the testile industry workers are paid less compared to those in food and pharmaceutical industries (Muteti 2001). One could also argue that some workers might have left the firm due to chronic sicknesses, accidents, family problems and perhaps death.

Despite the decrease, it is noted that this firm employed many people compared to the other two firms studied. This is not surprising because this particular firm is believed to be the largest and operates a

double shift (day and night). This has created jobs for the people of Uganda.

Further investigations also indicated that firm A employs some workers on temporary terms. In 2001, of the 1,000 workers 300 were temporary. Temporary workers are needed especially during peak periods in production. They help to handle large orders. When the peak periods are over, it is cheaper for the firm to lay some of them off than maintain them when there is not much work. This is a disadvantage to the workers because they do not get terminal benefits. Employees in firms B and C were on permanent terms. It is important to note that jobs have been created compared to the time firms were closed.

4.4.2 Gender Distribution in the Three Selected Firms in 2001

The number of male and female employees was also investigated. The data is presented in table 8.

Table 8: Gender Distribution of the Workers in 2001 by Firm

Firm	Male		Female		Total	
	N	%	N	%	N	%
A	750	75	250	25	1000	100
B	300	85	50	15	350	100
C	81	40	120	60	201	100

In the year 2001, male employees were 750 while that of the female was 250. In firm A it was noted that 70 more men were employed during this particular year compared to the previous year. However, the number of women was less by 125 compared to the previous year. The

decrease in numbers of female workers could be attributed to some of them dropping out of employment due to health problems and family responsibility, given that women have multiple roles to play in society. Research has indicated that women working in textile industries are prone to health problems such as chest pain and headache (Muteti 2001).

Firm B also employed more men than women. Despite the fluctuations in the number of workers employed in the year of study, it was clearly observed that there were more men than women. This confirms the findings in 13 clothing firms in Nairobi. Oigo (2000) also observed that the majority (62%) of the garment firms in Nairobi had a higher proportion of male than female employees. These findings are contrary to the observation that the clothing industry is the largest employer of women in Kenya (Oigo 2000).

To the contrary, firm C employed more women than men. This particular firm specialises in garment manufacture where more tailors/machinists are needed. Research has shown more women in the textile industry take up secondary jobs such as tailoring (Muteti 2001).

4.4.3 Qualification of the Workforce in the Selected Firms

Table 9: Range of Qualifications of the Workforce in the Year 2001

FIRM	Degree	Diploma	Certificate	Total
A	41	300	545	886
B	-	-	-	-
C	10	21	94	115

Qualifications of the workforce in this firm were also investigated. These ranged from certificates to degrees. From the above analysis, it was noted that there were fewer employees with degrees than diploma and certificate holders in the two firms. It was also noted that the degree or diploma holders were mainly managers and supervisors. Those who had certificates were mostly machine operators.

According to the management of this firm, education plays a vital role in staffing although it may differ from one department to another. For example, departments like engineering call for educated personnel in that field; while garments department calls for knowledge of tailoring. Again, here education is an important factor in improving the status of the textile industry. The large number of certificates implies that further training is necessary especially for the machine operators. This is due to changing technology in the textile industry. Good education will also improve the quality of textiles produced.

Management also recognises that the right kind of training and experience is important in the textile industry as different operations call for different experiences. Generally, all production departments call for textile trained workers, while engineering department requires trained technicians and administration calls for personnel equipped with administrative skills. Experience and training are therefore important factors in promoting the status of the textile industry.

Data on qualifications in firm B were not obtainable because it was highly confidential.

4.4.4 Range of Products in the Selected Firm

The range of products investigated is presented in table 14.

Table 10: Range of Products in the Selected Firms

Firm A	Firm B	Firm C
Uniforms	Cotton plain bedsheets	T-shirts
shirts	Cotton printed bedsheets	Briefs
trousers	Poplin fabric	Shirts
Skirts	Kitenge fabric	
Plain fabric	Baling cloth	
Dyed fabric	Drill	
Printed fabric	Canvas	
Bed sheets		
Pillow cases		

The textiles produced by the three firms varied. Each firm specialised in one or more types of products. This is characteristic of large firms. At least two firms produced more than one type of textile items. This is not a surprise because diversification is necessary for the survival of the firm.

Firm A does everything right from spinning, weaving, processing of fabrics to manufacturing finished garments to international standards. The products have been approved under the International organisation for Standardisation (ISO 9002). Because of this big advantage, the firm

can fulfil any of the customer requirements in terms of quality and quantity. Apparently, this firm makes a wider range of uniforms for defence, police, school, hospital and other institutions. The firm makes shirts, trousers, skirts and so on for other customers. The firm also produces a wide range of plain and printed fabrics. These fabrics include: 100% cotton; polyviscose; 100% polyester; tetron and poly cotton. The firm also makes bedsheets and pillow covers in a range of quality, colours and prints. These products were observed during a visit to the firm. This observation confirmed the verbal information given by the respondents during the interview. This firm happens to be the only full-fledged textile mill in Uganda. This firm was privatized in 1996 and since then, several million dollars worth of new investment have been injected into buying machineries, enabling the company to produce a wide range of printed and dyed fabrics and garments stated above.

As noted above the firm has achieved global quality acclaim following the ISO 9002 certification. Companies registered or ISO certified have had dramatic reductions in consumer complaints, significant cuts in operating costs, increased demand for their products and services and increased market share (*Daily Nation*, May 30, 2002). However, it should be remembered that acquisition of ISO certificate does not mean that a firm is perfect in its production and management processes. It means that the company is better placed to deal with the non-conformities, complaints and other problems. As noted, this firm is proud of her widening market share in both Uganda and the East African Region. Soon the long-term objectives of exporting to the United States of America under the African Growth and Opportunity Act (AGOA)

arrangement will be realised. Again, it is worth noting that this is a positive effect of liberalisation. Textile firms have the opportunity to enter the world market.

Firm B also does everything from spinning, weaving, processing, to dyeing and printing of fabric except garment manufacturing. The quality of her products has been recognised internationally. This was confirmed by the presence of a certificate for Quality Business Initiative Directions. This firm makes 100% cotton plain and printed bedsheets, poplin, kitenge, baling cloth, drill and canvas. The firm is hoping to produce for export market under the AGOA initiative.

Firm C is also integrated, that is it does everything from spinning, knitting, processing to manufacturing finished garments to acceptable quality standards. The products include: quality T-shirts and briefs; Quality shirts. The quality of the products in this firm lies in the brand name. It was noted that all the three firms were vertically integrated, that is, they produced the yarn, spun it, wove or knitted and converted it to the end uses.

On quality, this is what one respondent said that,

> *Our products are of acceptable quality standards. Two of the firms even had certificates related to quality recognition.*

One of the firms has been putting on quality of international standards on their products since the firm started operations. It is also noted that the AGOA initiative has motivated these firms to produce more and quality textile products. The firms are set to export to the American market under AGOA. This will contribute to the economy of the country; more cotton will be grown and more jobs will be created in the textile

industry. This will definitely improve the status of the textile industry. All these are positive effects of liberalisation.

4.5 Production Processes/Processing Operations

The fourth objective was to identify the production processes used in the firms. During data collection period the researcher toured the selected firms and observed the following processes in the production of textile fabrics. The processes were similar in the three firms except one firm that does knitting. The data obtained from the observation checklist was used to describe the processes. They consisted of the following:

Blowroom

In firm A the cotton and polyester fibres are mixed. Bales weighing 191 kg each are opened and cleaned after careful inspection on arrival from the ginneries. The mixing is done according to the order made by the customers. For example, the mixture can be 100 percent cotton, 60 per cent cotton and 40 per cent polyester (see Appendix 7). After mixing the fibres are sent directly to a machine called Trutzschler which produces cotton laps (Appendix 7). In firms B and C, only cotton fibres are used to form laps but the process is the same. According to Joseph (19810 and Bernatt (1997), opening of cotton is essential in order to obtain complete intimacy of blend and remove all the trash trapped in the cotton.

Carding – Cleaning and parallelising of fibres is done.

In this process, cotton laps form sliver using a machine called a card. A carding machine consists of rollers, which have pointed wires sticking out from the surface. The wire points pull the cotton fibres to make them parallel to each other and then separates them making a web-type structure. The web then forms slivers. Slivers are combined from about 7 cans to form rovings. Rovings are produced on speed frame called zinzer. This is a modern machine and has a high speed and package is high. This machine can also remove impurities from the lint.

Spinning

This is the final process of the yarn production sequence. Open-end spinning is done. Drafting is done to form yarn. During this process, faults in the yarn are cleared and placed on larger packages in preparation for parallel winding and twisting double yarn. The yarn is twisted during this process. According to Bernatt (1997) cotton can take a very high twist, which makes it stronger.

Winding

This is a stage where yarn is prepared for warping and weaving by parallel winding and twisting it, forming bigger packages (cones and cheeses) on winding and twisting machines. The objectives of this stage are: -

1. To bring the yarn in a better workable condition for weaving.
2. To improve the quality of the yarn by the help of yarn clearers.

3. To make bigger packages of yarn for the next process.

The machinery used includes; parallel winders and two for one (TFO) machines. Precautions are taken to ensure that the machines are well-maintained, kept clean, machine clearers are set properly and machine speeds are regulated.

Warping

This is the process through which yarn is transferred from cones to beams in preparation for sizing. The objectives are to prepare back beams for sizing, and to lay the yarn evenly between the beam flanges. The machinery used include: Schlaforst winder and Benninger winder. Precautions to be taken include ensuring that the machines are mechanically well-maintained and well-cleaned. Quality parameters are regularly maintained during this process. These include; warping breakage rate, breakage analysis and warping efficiency.

Sizing

Here the yarn is impregnated and covered by a starch solution to give it more strength to stand the tough condition of the next process. The objectives are: To protect the yarn against abrasion, stress and strain during weaving. And to reduce yarn hair. The following quality parameters are maintained at this stage:

Size pick-up %, size bath temperature check, lapping/breakage study and regractometer reading

Drawing/knotting

This consists of mounting of beams on looms, knotting on the same fabrics and drawing. Mounting of beams on looms is a stage that comes after the preparation of the weavers' beam. Mounting can be realized in two ways: Knotting of the same ends on the same fabric on the loom and drawing of the yarn through the heeled wires. Knotting of the same fabrics involves knotting the same warp yarn on the existing warp ends on the loom. This is done only when the construction of the weave is supposed to be the same. The objective is to tie/knot together the warps tentered on the knotting frame. Topmatic knotting machines are used. Drawing of warp ends through heeled wires and reed is only necessary when the fabric is of a different weave/construction.

Fabric Weaving

This is the stage where the yarn is converted into fabric. The yarn from the warp beams passes through the back rest/whip roller and comes forward through the drop wires of the warp stop motion to the healds (shafts) which are responsible for separating the warp sheet for the purpose of the shed formation. It then passes through the reed which holds the warp thread at uniform spacing and it is also responsible for beating up the weft thread that has been left in the shed. The temple holds the cloth at the fall to assist in the formation of a uniform fabric which then passes over the front rest, round the take-up roller and onto the cloth roller. These operations were recommended by Bernatt (1997) and produce a two-dimensional fabric. The machinery used in this process is called Sulzer loom. The following precautions are taken in

weaving processes: Ensuring the loom is maintained in good mechanical condition, machine cleanliness and the surrounding should be clean, ensuring that the beams are clean before mounting them on the machine and ensuring no mixing of materials, both warp and weft. The following quality parameters are maintained at this stage: Cloth construction check, cloth width, breakage study, loom speed, humidity check and general quality check.

Grey Folding

Materials are received from weaving in grey form. This is the final stage of the weaving process where the cloth is opened, checked and dispatched to processing department for wet processing. Rolls are separated according to types and graded. The objectives of this stage are: Quality checking, to trim the Grey fabric of loose yarns , fabric grading and to fold the fabric into standard batch sizes. The following machinery is involved in the grey folding process: Vaullen winder, kusters and hooking machine.

Singeing and Desizing

Fabric from the grey room is then subjected to singeing and desizing. Singeing is the burning of surface fibre and desizing is the removal of starch from the fabric. Singeing is done by machine and timing depends on the type of fabric and its purpose. Minimum temperature of 65°C is used. Desizing is done using a liquid containing common salt, acetic acid and soap. The liquid is boiled up to 60-65°C. This creates a medium which enables further processing.

Bleaching and Scouring

In this process an alkali treatment is given to the fabric and bleaching takes place. This makes the grey fabric appear white and easier to dye. A chemical called caustic soda is used at 90°C. Temperature used depends on the fabrics and helps to soften impurities. After bleaching and singeing the fabric is steam cylinder dried ready for printing and dyeing. The main purpose of scouring is to remove waxy parts which remain on the fibre during ginning.

Printing, Dyeing and Washing

To improve the appearance of the fabric colour and design are added. Bernatt (1997) confirms this by saying that colour is an important consideration. She explains that successful dyeing depends on the extent to which the dye stuff will bond to the fabric and remain fast. The dye stuffs used in this process include: Reactive, pigment, vat, sulphur, napthol and disperse. The dyed fabric is washed to remove excess dye absorbed. The products of the above process are heat set and sent for inspection, folding and cutting. From here, they are sent for garment stitching, packing and bedsheet stitching. The garments, bedsheets, and fabric are packed and taken for pressing, baling/cartoning. The detailed production processes have been summarised in the flow chart in Appendix 7. The other fabric production process identified only in firm C was knitting. It is a method of fabric construction by formation of loops using a knitting machine. The Brackenburry recommended knitting as one of the most important

processes for producing garments. In this firm, the knit fabric is cut to make T-shirts and briefs. The machinery used include single and double jersey and flatbed knitting machines.

4.5.1 Modern Technology in the Selected Textile Firms

During the observation process, the following modern machines were identified in different processes during the study:

1. Automated machines for spinning in all the three firms. They are designed specially for open-end spinning. The machines are fully electronic and some are computerised. These are faster and therefore speed up production. This was observed by Wingate (1984).
2. The Uster Tester was identified in firms A and C. The purpose of this machine is to test the evenness of yarn. This helps to run the production machines at optimum speeds. It also helps to produce high quality yarn.
3. Computerized bleaching machine is vital for preparation of fabric especially goods meant for printing and export. This was observed during the visit to one of the firms
4. In firm C, electronic knitting machines were identified for knitting fabric at a faster rate.

Modern technology in the textile industry is very important in view of the changing needs of the customers. As one respondent remarked during the interview.

> *Modern technology has increased the quantity and quality of textiles produced.*

From the discussions with the respondents, this technology is imported. This perhaps had financial implications on the part of the textile industries. Firms have to spend millions of dollars to import this technology. On the other hand, the importation of such machines was possible due to the liberalisation of the economy in the country. The staff required to operate the modern machines acquired were trained by the suppliers.

4.5.2 Quality Control in the Textile Industry

The researcher sought to know how quality control is ensured in the firms. It was observed that quality is ensured throughout the manufacturing process. There is a full department of quality control in each factory. Tests are done to ensure quality of the products at every stage. The following were the remarks of one of the managers working in firm A.

> *You know we have a quality control department. There are machines and people are trained to operate them. They are specifically for controlling quality throughout. We even have a quality policy. We are under ISO and we have a certificate from ISO.*

In all the three firms visited, the quality control laboratories were equipped with the basic apparatus required to carry out counter checks at various stages. One of the machines was the Uster Tester. The machines and quality policy are in Appendix 7.

4.6 Marketing Activities

The fifth objective was to identify the marketing techniques used in the firms. The markets for which the textiles are produced include, the army, schools, institutions, industries, hospitals and whole sale agents. The industries carry out sales promotion activities in the following ways:

Through electronic and print media, by contacting prospective consumers, participating in exhibitions and through display in shops.

One manager added this statement during the interview.

> *There is a fully-fledged marketing department for such activities. We continue getting orders.*

Market research is also carried out by specialists in marketing. The industry is also pursuing the possibility of being part of the AGOA.

4.7 Role of Uganda Government in Promoting the Textile Industry

The sixth objective was to establish the role of government in promoting the status of the textile industry. It was observed that the government supports the textile industry by buying the textile products through institutions such as schools, the army and hospitals. The government has also allowed firms to export under AGOA arrangement and offers training for the staff absorbed in textile industry through universities and colleges. On the other hand, the policies are not protecting the local textile industries. One manager remarked

> *For example, the zero tariffs might not be favourable with reference to East African Community (EAC).*

The policy of economic liberalisation has allowed imports of fabric and second-hand clothing in the country. This is a threat to the local textile industry as research has shown that some consumers prefer imported clothing to the one made in the country (Nyangor 1991).

4.8 Problems Encountered in the Textile Firms

The seventh objective was to identify constraints facing the textile industry. These were problems that employees encounter in the firms. Problems identified in the firms under study were categorized as follows:

1) Labour-related problems
2) Health and security problems
3) Problems related to raw materials supply, machinery and spare parts.
4) Problems due to the liberalisation of economy.

4.8.1 Labour-related Problems

Table 10 summarises these problems.

Table 11: Labour Related Problems in the Selected Firms

Problem	N	%
Absenteeism/irregularity	2	15
Lack of motivation and promotion/job valuation	4	31
Lack of cooperation	1	8
Low wages/lack of advance	2	15
Low level of education	1	8
Overstaffing/Understaffing in some departments	2	15
Unskilful workers	1	8

They included absenteeism and irregularity fifteen percent (15%), laziness and lack of motivation thirty one percent (31%), and cooperation eight (8%) on the side of workers which affected production. Absenteeism, mentioned by two respondents, was caused by inadequate salaries and wages which affect the morale of workers. Some workers go for greener pastures due to less pay. Migrant workers especially those from Northern Uganda normally look for alternative employment when they go for leave. Chuter (1988) pointed out that an absent operator not only represents a loss of hours available for productive work but is a cause of line imbalance. There is need for workers to attend duty regularly while management should try to motivate their employees by giving some form of incentives such as training, bonuses, and allowances. The workers especially machine operators need training given their low level of education and close supervision (Oigo, 2000).

4.8.2 Occupational Health Related Problems

A number of problems were cited in connection to the health of the workers. One of the most common problems was inhaling of the cotton waste when one did not have or use a mask properly; the eyes were also affected in cases where dust was too much. The problem was mentioned by ten respondents. Inhalation of cotton fluffs is a serious problem because it leads to lung diseases, thus affecting the health of the workers. It is important that workers are provided with proper masks and be taught how to use them. Supervisors must ensure that everyone under their care wears the mask during working hours.

Another problem raised by at least two respondents was too much noise from the machines. This is noise pollution and could lead to deafness. Four respondents mentioned the problem of too much heat which made them uncomfortable. One respondent raised the issue of chemicals as being dangerous to their health.

Four respondents mentioned lack of transport especially during night time. This is important especially for those workers on night shift. One interviewee mentioned the need for transport fare for all workers. Another respondent mentioned slippery floors as a problem which requires protective clothing such as gum-boots.

Many problems were cited with respect to many and long hours of work. Some respondents mentioned that the long hours of standing made them too tired. One pointed out that operating the machine for long hours without rest made them very exhausted. Four mentioned the problems of chest pain after long hours of operating the machines. One respondent added the problem of swollen legs as a result of operating the machine for long. This observation was expected because Muteti (2001) found that the textile industry was characterised by high incidences of health problems and strenuous working conditions.

Three respondents raised the problem of being overworked. For example, work for five people is done by one person and combination of work in the section. This problem was also raised by managers who worked in 13 clothing industries in Nairobi (Oigo, 2000). Management should consider recruiting more staff to reduce the workload.

4.8.3 Problems Related to Raw Material Supply, Machinery and Spare Parts

These were problems arising from delays in providing raw materials, machinery and new spare parts, lack of maintenance. Results were summarised in table 12.

Table 12: Problems Related to Raw Materials Supply, Machinery and Spare Parts

Problem	N	%
Raw Material Supply		
Not getting raw materials in time	2	9.5
Lack of raw materials	1	4.8
Machinery & spare parts		
Machine having many operations	1	4.8
Machine was long	1	4.8
Machine was dirty	1	4.8
Removing waste from machine	2	9.5
Machine breakdown	5	23.8
Lack of spare parts/take long to arrive	5	23.8
Lack of maintenance by operators	1	4.8
Old type of machinery	2	9.5

Three respondents mentioned problems related to raw materials supply. Two had a problem of getting raw materials in time. Although the government has facilitated the growing of cotton, some firms do not

get it in time from the ginneries due to transport problems. Ginneries should find easy ways of delivering the same to the firms. The other respondent cited lack of raw material. Eighteen respondents mentioned problems related to machinery and spare parts. One said that the machine had got many operations resulting into work overload; the other one said the machine was long and needed four people instead of one to operate it. One said the machine always became unclean so it needed cleaning every time because it used colour; while another problem was removing waste from the machines; mentioned by two respondents.

Five respondents mentioned the problems of machines breakdown and one of them said that mechanics take time to repair the machines when they are down. This affected the daily output and mechanics should be on stand by to rectify the problems promptly. One respondent mentioned that machine operators do not look after the machine well.

Four respondents mentioned lack of spare parts and if imported take long to arrive at the firms. One interviewee mentioned lack of measuring tools and machine accessories. One respondent mentioned old type of machine while another one pointed out use of old and worn-out shuttles which break thread from time to time, making the joining difficult especially when one is already tired. Dirty, old broken machines can lead to poor yarn quality if fabric produced. Also the long time taken before repairing them implies loss of production

4.8.4 Problems due to the of Economy

All the three firms experienced problems from liberalisation. Three problems related to liberalisation were identified. The greatest problem

was low-priced imported new and second-hand clothes (*mitumba*) which have flooded the market, thus causing competition. These are a problem in Uganda because people prefer them to new locally made garments These problems are noted with concern because research has shown a decline in the industry due to liberalisation (Oigo 2000). This problem was also experienced by clothing industries in Nairobi and was rated as the greatest (Oigo, 2000). The second problem was that cotton was bought at open market due to economic liberalisation. Open-market prices are not favourable for the local industry as they tend to be relatively high. The third problem was lack of market when production was enough. This was attributed to government policy of liberalisation.

4.8.5 Other Problems

These included high utility tariffs, high transport costs for raw materials and products, unwillingness of Banks to lend money to textile sector, corruption among some businessmen and high taxes on imported inputs such as dyes and synthetic fibres.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

5.1.1 Purpose of the Study

The purpose of this study was to explore the status of Uganda textile industry in a liberalised economy. The study investigated the characteristics of the employees in selected firms, sources of raw materials, production processes and marketing techniques used in the selected composite textile firms.

5.1.2 Research Objectives.

The study sought to achieve the following objectives.

1. To determine the demographic characteristics of the respondents in the selected textile firms.
2. To establish the sources of raw materials used in the selected firms.
3. To determine the characteristics of the selected firms.
4. To identify the production processes in the selected firms.
5. To identify marketing techniques used in the textile firms.
6. To establish the role of Uganda government in promoting the textile industry.
7. To identify constraints facing the textile industry.

5.1.3 Procedure

The study was conducted in three composite textile firms in Uganda. These firms were the ones operating at the time of this study. They were purposively selected. The study was conducted using interview schedules and an observation checklist for managers in charge of production, quality control and marketing departments, supervisors and machine operators. The observation checklist was used to establish the processes modern technology and products in the firms. The data collected were coded and analysed, then presented in descriptive form. Some of the data was presented using tables and charts.

5.1.4 Major Findings of the Study.

The results of this study indicated that all the managers interviewed were married men except one lady who was single and fell in the in the age category of 30-50 years. In terms of work experience, all of them had worked over 4 years and had attained college or university education. They all had received formal pre-service training in areas that were directly related to their jobs and were adequately prepared for the work. Eight supervisors were married men while the two were single women. Majority were between 25-39 years sixty percent (60%) had worked for over 2 years. Majority of the operators were aged between 22 and 39 years. There were more male than female operators. Many operators had work experience ranging from 4 to 6 years. Majority had attained formal education and training.

The major raw material fibre used in the three firms is cotton which is mainly locally sourced. It is obtained directly from farmers at open market price following liberalisation. The main methods of fabric construction used in the firms are weaving and knitting.

The firms are large and produce fabric for uniforms, bedsheets, children's wear, ladies and gents wear. The target markets are both local and international. The local market consists of schools, hospitals, police, army and Non-Governmental Organisations (NGOs). The firms advertised through electronic and print media, personal selling and exhibitions. It was also noted that government supports the industry by purchasing uniforms for the army and police, and making arrangements for interested firms to export to the U.S. through AGOA.

All the firms had problems. The common problems cited were related to labour, health of workers (suffered chest pain, exhaustion and swollen feet), delay in raw materials supply, machinery and spare parts. These affected the performance of the workers in turn lowered production. Each firm at least mentioned the problem of imported second-hand clothes (*mitumba*) which have flooded the market. This was caused by economic liberalisation. Nevertheless it was noted that liberalisation had a positive impact on purchasing of cotton directly from farmers and importing machinery.

5.2 Conclusions

The following conclusions were drawn from the findings of the study:

1. All the managers had appropriate training, long years of work experience and sound educational background.
2. Majority of the supervisors were experienced with sound educational background.
3. Although the majority of machine operators had experience and education, more training would be necessary in view of the fast changing technology in the textile industry and also to address the labour problems experienced in the firms.
4. Cotton fibre remains the major raw material in the textile industry because it can be obtained directly from the farmers without hindrances. This is possible because of the liberalisation policy on cotton production in Uganda.
5. The major production processes used in the firms were appropriate and some of them have been automated and computerised in order to speed up the operations.
6. The textile industry is a source of employment to men and women of Uganda besides meeting the clothing needs of the people and contributing to the economy through earning foreign exchange and paying taxes.

On the whole the study concluded that the textile industry in Uganda has the potential to grow and develop. Before liberalisation some firms wee closed. Cotton growing had declined and importing machinery was

difficult. In my view liberalisation has had both positive and negative impact on the status of the textile industry. The positive impact includes the freedom for firms to obtain cotton directly from ginners, importing machinery, allowing firms to export through AGOA which is leading to improved quality of products. The negative impact is due to freedom to import new and secondhand clothes which offers competition. At the time of this study all the three firms were preparing for export through the AGOA initiative. The future of the textile industry in Uganda is bright. There is therefore need to address the problems identified during the study so as to improve the status of the industry.

5.3 Recommendations

On the basis of the findings of this study, the following recommendations were made:

1. The government of Uganda should continue to take strict measures to reduce the importation of secondhand clothes which are a threat to the textile firms. It should reduce the amount of new textiles imported or enforce regulations so that full taxes are paid on all textile imports. Although the government has already started on this, it needs to strictly follow it up to protect Uganda's textile industry against competition.
2. Government should continue to encourage investment in the textile industry for full capacity material development. This could be by reducing taxes on raw materials and machinery imported to enhance efficiency and profitability. The government should also

encourage local production of machinery and some raw materials like dyes.

3. Government should protect the local industry against corrupt businessmen that practise dumping of undesirable textiles in the country which puts local manufacturers at a disadvantage in the international market.
4. Government should intervene particularly in high rates on utilities such as electricity and telephone.
5. Management in the textile firms should follow the labour laws when handling their employees especially concerning wages and hours of work..
6. Government together with training institutions and universities should encourage training in areas of textile science and design so that the textile industry can take on more of professional and technical people especially the supervisors and machine operators.
7. There should be in-service training for workers already employed in the textile industry.

5.4 Suggestions for Further Research

This study makes a unique contribution to policy on textile industry development in Uganda and provides impetus for further research in the following aspects:

There is need to:

1) Examine the importance of technology transfer to identify locally available technology suitable to local conditions as well as the cost of suitability of alternative technologies in textile development.
2) Assess the status of the ginning and spinning industries
3) Carry out a study on small and medium textile firms.
4) Study the relevance of the training programmes offered by training institutions and universities in the country.
5) Investigate the training needs of machine operators so as to equip them with the technological changes in the textile industries.
6) Examine the management practices in the textile industry.

REFERENCES

African Development Bank (1994). An Economic Report on African Countries. Nairobi, Kenya.

African Development and Economic Consultants Ltd, (1998). A Diagnostic Study On Cotton Ginning and Textiles Industry Development in Kenya. Final Draft Report. Nairobi.

Bernatt, A. (1997). Examining Textiles Technology. Heinman Educational Publishers, Oxford London.

Burkinshawsm (1995). Chemical Principles of Synthetic Fibre Dyeing. Chapman and Hall London, U.K.

Chuter, A.J. (1988). Introduction to Clothing Production Management. Oxford: BSP Professional Books.

Cline, W. (1978). Imports and Consumer Prices: A Survey Analysis. Brookings Institution. Unpublished Report.

Cooklin, G. (1991). Introduction to clothing manufacture. London Oxford BSP Professional Books.

Colchester, (1991). The New Textiles. Trends and Traditions. London: Thomas and Hudson.

Coughlin P. (1986). The Gradual Maturation of an Import Substitution Industry. The Textile Industry in Kenya. Unpublished Manuscript.

Government of Uganda, Ministry of Planning and Economic Development, Background to the Budget (1999/2000) Kampala.

Government of Uganda, Cotton Development Organisation Quarterly Report, July - September, 1997 Industrial and Commercial Magazine – Vol.3 No. 3 1999, p.9. Kampala.

Government of Kenya (1993). Economic Survey. Nairobi: CBS, Ministry of Planning and National Development.

Guerreiro, M., Jarnow, J.A. Judelle, B. (1987). Inside the Fashion Business (4th Ed.). New York. Macmillan Publishing Company.

Heaton, A(1996). An introduction to industrial Chemistry. Chapman and Hall, Glasgow.

Jumire, C.H (1969) Revolution in Ugandan Textile Design. A thesis for the Diploma in Fine Art. University of East Africa, Nairobi.

Horn, M.J. (1975). The Second Skin. An Interdisciplinary Study of Clothing. Boston. Houghton Mifflin Co.

Kitty, G.K., (1990). Textiles and Apparel in the International Economy. New York. Macmillan Publishing Company.

Kitty, G.K., (1998). Inside the Fashion Business (6th Ed.). New Jersey. Prentice-Hall, Inc.

Kenya Times (November, 24, 1993). Liberalisation to kill jobs.

Markert, R.L. (1989). Contemporary Technology. Illinois: Willcox Company.

Marshal, C. and Rossman, G.B. (1995). Designing Qualitative Research. 2nd Ed. California. Sage Publications, Inc.

Lester, R. H. et al (1977). Quality Control for Profit. New York: Industrial Press, Inc.

Lutamu, R. (1987). The Textile Industry in Uganda. Kampala.

Lockyer, K.G. (1983) Production Management: 4th Ed. Pitman Publishing Ltd. London.

Mugenda, O.M. and Mugenda, A.G. (1999). Research methods: Qualitative and Quantitative Approaches. Nairobi, Acts Press.

Muteti, N.S. (2001). Health Problems Experienced by Working Women in Industrial Occupations. A Study of Selected Industries in Nairobi Kenya. Unpublished Masters Thesis, Kenyatta University.

Nyang'or, E.A. (1994). Factors Influencing Consumer's Selection of Imported Over Local Clothing Among Working Women in Nairobi, Kenya: Unpublished Masters Thesis. Kenyatta University, Nairobi.

Oakland, S.J. (1989). Total Quality Management: Oxford Heinemann Professional Publishing Ltd.

Oigo, E. (2000). A Study of the Training Needs of Quality Control and Production Managers in Clothing Industries in Nairobi. Unpublished Master's Thesis. Kenyatta University, Nairobi.

Otieno, G.K. (1991). Physiological, Psychological and Socio-Economic Factors Influencing Selection and Buying Practices Among Kenyans: A Study of Kenyatta University. Unpublished Masters Thesis, Kenyatta University, Nairobi.

Otieno S.B. (2001). Accidents as Occupational Health Problems: A Case of Badadogo Industrial Area Nairobi. Unpublished Masters Thesis, Kenyatta University.

Rudie, R. (1998). California's textile industry thrives on quick-turn creativity: Miller Freeman, Inc.

The Uganda Manufacturers Directory, 99/2000. Kampala.

Tortora, P.(1982), Understanding Textiles. (3rd Edition) New York. Macmillan Publishing Company Inc.

Uganda Manufacturers Association (2000). Kampala.

USAID (2000). African Growth and Opportunity Act. Implementation Guide, Bureau of African Affairs.

Werbeloff, A. (1987). Textiles in Africa. A Trade and Investment Guide. U.K. Alain Charles Publishing Ltd.

Wilson K. (1979) A Hisotry of Textiles. Westview Press. Inc.

Wingate B.I. (1984). Textile Fabrics and their Selection: (8th Ed.). New Jersey. Prentice Hall.

World Year Book of Education (1985), Research Policy and Practice, U.S.A. Nicholas Publishing Company.

APPENDICES

APPENDIX 1

Data Collection Instrument – Interview Schedule for Production Managers and supervisors.

Introduction

Hello! I am Tenhwa Florence, a post-graduate student at Kenyatta University, in the Faculty of Home Economics. I am carrying out a research on "The Status of the Textile Industry in Uganda." I have selected your firm as one of the most appropriate ones to get the information about the industry.

I would like to ask you some questions and please kindly assist by answering them as honestly as possible.

Thanking you for your co-operation.

PERSONAL INFORMATION (FOR ALL RESPONDENTS)

1. Position/post you hold in this firm:
_____
2. Duration of service:
_____
3. Gender
:_____
4. Marital status :
_____
5. Please indicate the age range in which you fall:
   [ ] Below 25 years
   [ ] 25-35 years
   [ ] 36-46 years
   [ ] 47-57 years
   [ ] Above 57 years

   (Please tick the age range in which you fall)
6. Education level :_____
8. Indicate the highest professional qualification that you hold : _____

SECTION A: DETAILS ABOUT THE FIRM.

9. What are the products for? [ ] Local market [ ] Exporting [ ] Both
10. What is the total number of people working in this firm?
   [ ] 20 - 49 [ ] 200 – 499
   [ ] 50 – 99 [ ] 500 and above
   [ ] 100 – 199.

10a). How many are females?___ How many are males?___

11. How are the textile items transported within the sections of the factory?

   [ ] Manually – pushed by hand along a bench or table
   - Pushed in a cart or trolley

[ ] Mechanically – by conveyor belt
Other (specify)

12(a) What raw materials do you use? _____

(b) How do you obtain these raw materials? _____

(c) What is the cost (in Uganda Shs.) of the raw materials? _____

13 What are the major production activities going on in your firm?

(i) Yarn construction by carding, drawing, combing and spinning.
(ii) Fabric construction by weaving.
(iii) Fabric finishing by bleaching, mercerization, singeing etc.
(iv) Fabric designing by printing, dyeing etc.
(v) Packaging and delivering of textile fabrics
(vi) Others (specify) _____

14(a) What new technologies do you have for;

i. Spinning _____
ii. Weaving _____
iii. Finishing _____
iv. Packing _____
v. Other (Please specify) _____

(b) What impact have these new technologies had on:

(i) Nature of labour skills required

(ii) Quantity and quality of the textile products?

(c) Have you had to retrain your staff in order for them to apply the new technology? If so, in which areas?

_____

_____

_____

15(a) How do you ensure quality of the textile products of your firm? Through:

[ ] The design process
[ ] Manufacturing process
[ ] Extensive after sales service
[ ] Other, please specify. _____

(b) What tests do you carry out to ensure quality of the textile products?

_____

_____

16(a) Do you carry out any sales promotion activities for the firm? If so, how?

(i) Through mass media e.g
(ii) By sales persons
(iii) By participating in exhibitions
(iv) Through displays in shops
(v) Any Other _____

_____

(b) How successful have you been?
Explain your answer

_____

_____

_____

_____

(c) How often do you carry out market research? _____

_____

_____

17(a) Who are your major customers? How have they influenced your business?
(Please explain)

_____

_____

_____

(b) Have there been any changes in national economic policies that have affected the marketing of your products?

_____

If so, what are these changes and how have they affected the marketing of your products? _____

_____

_____

_____

(b) What tests do you carry out to ensure quality? _____

_____

_____

18(a) What contribution does your firm make to the national economy?

_____

_____

_____

(b) What kind of support does the government of Uganda give to your firm?

_____

_____

19(a) What proposals and recommendations would you like to make in order to improve the status of your firm?

(i) _____

(ii) _____

(iii) _____

(iv) _____

(v) _____

(b) In your view, has liberalisation of the economy helped to improve the status of the textile industry? If so how?

_____

_____

_____

SECTION B (PROBLEMS FACED BY THE FIRM AND SUGGESTED SOLUTIONS)

(v) What problems does your firm experience? Please suggest solutions to each problem.

Problem	Solution
(i) _____	_____
(ii) _____	_____
(iii) _____	_____
(iv) _____	_____
(v) _____	_____

APPENDIX 2

OBSERVATION CHECKLIST

This instrument will be used to identify the steps and products in the selected textile firms. Please put a tick (3) to show steps and across (X) to show steps not carried in this firm.

Step	Done	Not done
Carding		
Drafting		
Combing		
Spinning		
Weaving		
Knitting		
Bleaching		
Scouring		
Mercerisation		
Water proofing		
Dyeing		
Printing		
Products		
Other(Please specify)		

APPENDIX 3
INTERVIEW SCHEDULE FOR MARKETING MANAGERS

1. What is the title of the post you hold in this firm?.....
2. How long have you held this post.....
3. What is the highest level of formal education that you have attained?.....
4. Gender.....
5. Marital status.....
6. What is your age?.....
7. What is the highest professional qualification that you have attained.....

SECTION A; CHARACTERISTICS OF THE FIRM

8. For which type of market are the products your firm makes?.....
9. What was the quantity for the local market in 2001.....
10. What was the quantity for the local market in 2001?.....
11. Who are your major customers?
    .....
12. Who has been you major competitor?
    .....
13. How do you cope with competitors?
    .....
14. What marketing tools have you found useful in your firm?
    .....
    .....
15. What are the education levels of your staff?.....
16. What type of training have your staff undertaken?
    .....
17. How does the previous experience gained by your staff affect your operations.....
18. What plans do you have for your firms?
    .....

SECTION B: PROBLEMS

19. Which problems do you face in carrying out your job? Please suggest how these problems can be solved.
    .....
    .....
    .....
    .....

APPENDIX 4
INTERVIEW SCHEDULE FOR GENERAL MANAGERS

1. What is the title of the post you hold in this firm?

   .....

2. For how long have you held this post?

   .....

3. What is the highest level of formal education that you have attained?.....
4. Gender.....
5. Marital Status.....
6. What is your age.....
7. What is the highest professional qualification that you hold?
8. (a) What was the total number of workers in this firm in 2001?
   (b) How many were males; and how many were females in 2001?
9. What was the range of qualification of your work force in 2001
10. What role does education play in your firm

    .....

APPENDIX 5

INTERVIEW SCHEDULE FOR MACHINE OPERATORS

1. What is the highest level of formal education you have received?.....
2. What is the highest qualification you have?.....
3. What is your age?.....
4. How long have you worked in this firm?.....
5. What is your marital status?.....
6. Gender/ (Male or Female).....
7. Which problems do you face incarrying out your jobs?

.....

.....

.....

.....

Cotton Production in Uganda

PRODUCTION OF LAPS