PN-ABZ-738

92541

CHEMONICS INTERNATIONAL INC.

ETHIOPIA TEXTILE SECTOR STUDY: FINAL REPORT

Project No. 663-0005-00-3-40054 and Amendment 1
Contract No. 663-0005-C-00-6210

Submitted to:
USAID/Addis Ababa

Submitted by:
Chemonics International Inc.
Texas Tech University
Shawel Consult International

July 26, 1996

ETHIOPIA TEXTILE SECTOR STUDY: FINAL REPORT

Project No. 663-0005-00-3-40054 and Amendment 1
Contract No. 663-0005-C-00-6210

Submitted to:
USAID/Addis Ababa

Submitted by:
Chemonics International Inc.
Texas Tech University
Shawel Consult International
with the participation of:

Dean Ethridge, Team Leader
Bekele Alemu, Management Specialist
Dembel Balcha, Financial Analyst
Tedla Bekele, Weaving Specialist
Yilma Beyene, Production Specialist
Semachew Bezabeh, Marketing Specialist
Richard Combs, Dyeing/Finishing Specialist
Don Ethridge, Fiber Sector Economist
Woldeselassie Habteab, Spinning Specialist
Ted Hazard, Financial Specialist
Richard O'Sullivan, Marketing Specialist
Dean Redding, Textile Engineer
Mike Rossman, Field Administrator
John Smith, Weaving Specialist
Gezahegn Tessema, Finishing Specialist
Robert Zubrow, Garment Specialist

July 26, 1996

CHEMONICS INTERNATIONAL INC.

July 26, 1996

Mr. Gezahegn Kebede
Contracting Officer's Technical Representative
United States Agency for International Development
Addis Ababa, Ethiopia

Reference: Project No. 663-0005-00-3-40054 and Amendment 1,
Contract No. 663-0005-C-00-6210

Subject: Ethiopia Textile Sector Study

Dear Ato Gezaghn:

Chemonics International is pleased to submit the final report of our study of the Ethiopian Textile Sector. We believe this report to be the most comprehensive assessment of the Ethiopian textile sector ever undertaken. Our recommendations are based on months of field work in close collaboration with Ethiopian Government officials, farm, mill, and factory managers, suppliers, consumers, USAID and multi-lateral donors, and other interested parties.

We would like thank all the people who assisted us in performing this vital work including yourself and your colleagues at USAID, the staff of the Ethiopian Government Textile Study Task Force, and the many other organizations and individuals, too numerous to list, who spared valuable time to enlighten our understanding of the sector.

Thank you for the opportunity to perform this important task and to make an impact on the continuing development of Ethiopia.

Sincerely,

Dean Ethridge

Dr. Dean Ethridge
Project Team Leader

1133 20th Street NW Suite 600 Washington, DC 20036 Telephone 202-955-3300 Fax 202-955-3400

TABLE OF CONTENTS

TABLE OF CONTENTS
(continued)

6

ACRONYMS

ASIEX	Association of Foreign Investment Companies
CBE	Commercial Bank of Ethiopia
DBE	Development Bank of Ethiopia
EDDC	Ethiopian Domestic Distribution Corporation
EDI	Electronic Data Interchange
EPIA	Ethiopian Private Industry Association
GDP	Gross Domestic Product
GNP	Gross National Product
ICAC	International Cotton Advisory Committee
ISPC	International Statistical Programming Center
LTA	Long Term Agreement
MFA	Multi-Fiber Agreement
NBE	National Bank of Ethiopia
NTC	National Textile Corporation
PESA	Public Enterprises Supervisory Authority
QR	Quick Response
STA	Short Term Agreement
SWOT	Strengths-Weaknesses-Opportunities-Threats
TGE	Transitional Government of Ethiopia

EXECUTIVE SUMMARY

A. Introduction

Ethiopia's cotton/textile sector, for the purposes of this study, includes cotton production, spinning fabric formation, dyeing and finishing, and cutting and sewing. The sector contributes approximately 1 percent of the Gross Domestic Product (GDP), or about 18 percent of the gross value of production from manufacturing. It employs approximately 30,000 people. Most of the sector is publicly controlled, with more than 99 percent of the textile manufacturing employment residing in 18 public enterprises.

Since Ethiopia began economic liberalization in 1991, the sector has experienced a significant downturn in production and sales. The purpose of this study, as understood by the Chemonics team, was to analyze systematically the causes of its failure to perform well and recommend actions by the government and the enterprises to enable the emergence of a viable, competitive cotton textile sector.

Research activities were coordinated through the Textile Task Force of the Public Enterprises Supervisory Authority (PESA). Procedures included on-site visits at the enterprises and interviews with key industry participants. When feasible, quantitative data were collected and analyzed; if quantitative data were unavailable or unreliable, state-of-the-art qualitative research techniques were used.

As the study progressed, a dilemma became apparent. In the aftermath of substantial structural changes since 1991, the government and the public sector bureaucracy were hopeful that a combination of tactical adjustments and infusions of donated capital would be sufficient to stabilize the enterprises. However, our research leads to the conclusion that poor performance was rooted in structural problems.

The study uncovered:

- Gross inefficiency, excess labor, and mismanagement in every department and at every level
- Extraordinary misallocation of resources despite crippling debt burdens and negative net worths
- Profligate spending on unnecessary spare parts while essential maintenance needs go unmet
- A universal disinterest in developing marketing capabilities and widespread disregard for customer needs

The findings were consistent with those reached by IBERC in 1991, Werner International in 1992, and the Irish Trade Development Institute in 1994. Rather than simply verify these conditions, the Chemonics team focused on understanding how the conditions continue to exist, having been identified repeatedly under several different mill managers and two different governments. How could industry performance remain the same if managers and government owners had changed?

Extensive qualitative interviews with enterprise managers, customers of the enterprises, and government officials, revealed that no one was willing to make competitive viability of the cotton and textile enterprises a priority. In spite of the high turnover rate among general managers in the mills, none saw the success of the enterprises in the marketplace as determining the survival of their positions. Nor did they believe that such success held personal rewards. Rather, they believed their ability to remain in the positions and benefit from them was dependent on satisfying the imperatives of a quasi-political bureaucracy. Indeed, frustration with the lack of support and direction from enterprise owners was the primary cause of the high turnover of senior management in the mills.

This study's recommendations are predicated on the government's commitment to articulated strategic objectives and rewards for achieving them. The government must function as if it were the bona fide owner of the enterprises and require positive net revenues as the primary condition for their continued existence. Otherwise, attempts to adhere to these recommendations will not be effective.

The government has avoided a straightforward interpretation and implementation of the Public Enterprise Proclamation No. 25/1992; doing so would have resulted in the dissolution of some cotton textile enterprises. Nor has there been interest in promoting the idea that viable, independent, and profitable enterprises are the only kind that will survive. This procrastination is seen by the Chemonics team as understandable and inevitable. Management and labor currently expect that the government will not dissolve these enterprises as long as they remain under government ownership. These dynamics satisfy the imperatives of political processes that are used to negotiate reward and punishment but are undermining the Ethiopian textile industry.

B. Summary of Findings

Institutional framework and structure. The sector is overseen by the Public Enterprises Supervising Authority (PESA), which appoints the board of each public enterprise. The board in turn appoints the general manager tasked with day-to-day operation of the enterprise. The result of PESA's control over the basic chain of command has been to create a public sector industry firmly rooted in the top hierarchy of national politics. The study team found that this structure works against any attempts to improve the performance of the sector because it does not allow general managers to make the necessary, often politically unpopular decisions needed to make inefficient enterprises profitable. Priority should be put on putting in place a structure that insulates management decisions from political pressures to serve social goals. This in turn will allow industry managers to change their conduct, thus improving sector performance.

Financial evaluation. In financial terms, the sector is in deep crisis. According to the team's findings, only 1 of the 18 companies is financially sound, 5 are rated financially intermediate, and 12 are rated as financially unsound. The industry is losing money, has a negative net worth, and has little liquidity. It relies primarily on overdrafts to fund its current operations. Assuming basic structural changes in the environment within which the enterprises work, action needs to be taken to review accounting entries and balance sheets for asset revaluations and overvaluations, call in accounts receivables, increase the use of cost accounting, and bring all audits up to date.

9

Organization and management. PESA's ability to stem the financial hemorrhage within the industry is circumscribed by impediments within the board and enterprise management structures that prevent autonomous action by managers. Impediments include lack of management expertise, job insecurity among executive officers, systemic biases toward labor over management, interference by PESA and boards in operational decision making, irresponsibility by the media, and the refusal of key institutions to recognize the legal changes enabling autonomous enterprise management. Making alterations in PESA's relationship to the sector and improving management expertise would alleviate many organizational and management constraints within the sector.

Economic and marketing evaluation. Ethiopia is still in the midst of a great transition from a centrally planned to a market-driven economy. The government's challenge is to maintain an orderly transition, but to avoid making it last so long that damaging distortions are perpetuated and new avenues of economic development are forfeited. Current slow real income growth and dispersed markets hinder the growth of the domestic textile market. Government polices that foster increases in total and per capita income are essential to the survival of the domestic textile industry.

Partial market liberalization has increased the impact of globalization, which requires greater communication between supplier and customer along with a need for a greater management ability to analyze, internalize, and respond to changing market demands. Structures and habits inherited from a centrally planned economy limit the ability to respond to increased market demands. Rational decision making is further constrained by scarce domestic and export market data limiting informed decision making on market segmentation, product development, and production scheduling. A focused effort by the Ethiopian government to build up market information would be useful.

Passive marketing techniques are a key holdover from the centrally planned economy and are pervasive throughout the industry. Until very recently, most textile enterprises limited their distribution of goods to a single wholesaler or distributer. However, the distributors acted as poor conduits of information between the mills and the consumers, leaving management uninformed as to consumer tastes and desires. A similar situation exists in the export sphere. The industry relies almost totally on foreign buyers to initiate export sales with no provision for export marketing budgets, promotional materials, or contact lists.

Given these difficulties and others, the public textile industry is incapable of competing consistently in global markets. Development priorities of the government reflect a supply-driven perspective. The apparent intention of the current policy is to use the domestic textile industry to consume domestic cotton, but primary importance is not given to customers and their preferences. The market is intended to serve the industry and not vice versa. Until this policy viewpoint changes toward a market servicing approach, a competitive and viable textile sector cannot develop.

To compete, the industry should become adept at defending its own domestic market before assuming an export emphasis. Then, as the domestic industry flourishes, exports can be emphasized. Industry development should follow a "four product stages of development" approach to growth—importation, import substitution, exportation, and re-importation. Lessons from South Korea, Mauritius, and the Dominican Republic highlighting the historical success of this approach are explored here in case studies.

Public cotton production sector. Cotton production in Ethiopia consists of three segments: state owned and operated farms, private commercial farms, and peasant farms. State farm enterprises constitute about 38 percent of the land area in cotton, while producing over 50 percent of the country's cotton. The public cotton farms are clearly among the highest cost producers, and except in years of global shortage, they will be unable to compete in major export markets. In the long-term, privatization of the farms is a viable route to reduce production costs and increase competitiveness. In the short-term, the farm enterprises should strive to improve worker incentives, input strategies, records and accounts, and management decision-making ability.

Technical evaluation of the public textile sector. The public textile sector consists of 14 enterprises engaged in the spinning, weaving, dyeing, and finishing of cotton and other textile fibers, along with the cutting and sewing operations that produce garments from textile fabrics. Eight enterprises are integrated textile manufacturers, two deal primarily with yarns, and four are garment manufacturers. Total employment for the 14 publicly held textile enterprises is nearly 26,000. Only 13 percent of total employment is in the garment manufacturing segment. In other countries, garment manufacturing, the least capital-intensive and most labor-intensive part of the textile sector, absorbs a much higher percentage of labor.

The technical team made site visits to all the textile enterprises. Dire Dawa Textile Factory, Kombolcha Textile Factory, and the Awasa Textile Factory were selected for technical case studies. In-depth annexes covering these three factories and the seven others are included at the end of this report. Reviewing the major processes involved in textile manufacturing allowed the team to identify basic problems and offer recommendations for improving the technical efficiency of each process.

C. Conclusions and Recommendations

All available evidence leads to the conclusion that most previous investment in the textile sector is already lost; the question is how this loss will be confronted. Two approaches are possible:

- Use public monies (either from domestic sources or foreign donor sources) to re-capitalize public sector enterprises, thus returning to a centralized, bureaucratic approach.

- Use public monies to absorb the losses and provide severance benefits for employees while allowing the public sector industry to shrink and a new textile industry to emerge.

The steps that Ethiopia has taken toward an open, competitive environment for textiles has benefited the country's 57 million consumers. At the same time, the domestic cotton textile sector has been exposed to the consequences of inefficiency and mismanagement. As a result, substantial downsizing is the only way forward for the public textile sector.

Five major policy options may be pursued for the public sector cotton textile enterprises. These are:

1. **Accelerate the pace of privatization.** This would require development of an investor-friendly environment in Ethiopia. Prerequisites would be timely debt forgiveness and labor severance packages, along with liberalization of labor market controls, customs procedures,

10

communications regulations, and currency controls. It would require a realistic valuation of each enterprise, with the understanding that some would not sell before dissolution is complete. The government will have to accept large paper losses.

2. **Expand export markets.** This would require changing Ethiopia's status as a secondary source, used only when primary sources are not available. Successfully serving export markets currently is not feasible because of shortcomings in critical areas: quality control, communication, production planning, marketing, transportation, financing, and pricing. The liberalization measures mentioned for privatization (labor, customs, communications, and currency) would also be necessary to enable significant participation in export markets. The shortcomings cannot be overcome without privatization and a repudiation of the priorities inherent to public sector bureaucracy. Regardless, the changes necessary for success in exporting will hasten the demise of inefficient enterprises.

3. **Emphasize domestic fabric markets.** The textile sector may be trying to do this now, but under the current bureaucratic structure only traditional, low-value fabrics are produced by domestic enterprises. Currently, all fabrics are channeled into a shrinking niche of the domestic market. If this practice continues, there will be growing pressure to down-size the textile manufacturing sector. Serving a broader range of domestic fabric demands would provide a foundation for moving into fabric and garment export markets; much of the marketing advice given in this report addresses this. However, implementing this advice under the current structure of the public textile sector is probably not feasible.

4. **Foster development of a private sector garment industry.** This longer-term option would not benefit the textile manufacturing sector for several years. In fact, it would require that the garment industry function separately from the textile manufacturing industry and that the import of fabrics and garment accessories be liberalized. Customs, communications, and currency would also have to be liberalized. Drawing ideas from garment imports must be allowed and encouraged. Copyright laws must be developed and enforced to protect investments in designs. A garment sector can enter export markets if unimpeded, thus clearing the way for the development of a domestic textile manufacturing sector. A market-oriented garment sector would guide the textile sector in producing the fabrics needed by the market. Meanwhile, most policies aimed at protecting the domestic textile manufacturing sector would have to be discontinued.

5. **Move deliberately toward a closed, centralized textile industry (i.e., make the market serve the industry).** This might require repressive measures to stop the movement of foreign-made garments and fabrics into Ethiopia, which would expose the inability of the existing industry to supply the textiles demanded by Ethiopians. The combination of reduced quality, fewer choices, and increased cost to domestic textile consumers could result in greater social unrest than downsizing the domestic textile industry.

The fifth policy option is mutually exclusive of the other four. The first four policy objectives are advanced by the same structural changes aimed at liberalizing laws and regulations affecting trade, ownership, communication, and labor. Advancing these objectives requires that the protection and maintenance of the existing public sector industry cease to be a priority. Moving quickly toward these objectives requires that the government disengage from direct participation in specific enterprises and engage in providing infrastructures necessary for assisting all enterprises. This requires that the government be willing to relinquish direct control of major economic activity. Such control must be subject to impartial laws that do not vary with government administrations and leadership.

Global political realities are rapidly evolving in ways that preclude a primary reliance on donor funds to advance development objectives. Examination of textile and apparel industry development in three nations—the Republic of Korea, Mauritius, and the Dominican Republic—revealed that effective economic development began when the governments shifted their attention away from raising funds by satisfying donor agencies toward satisfying investors. These are not just role models; they are timely examples of the only course that is likely to be available to countries such as Ethiopia.

The end of the Cold War and the ineffectiveness of extra-market investment in commercial business enterprises have diminished the likelihood that donor agencies will be a source of funds for the Ethiopian cotton textile sector. The United States and the European Union are reevaluating their strategy for development aid. Development activities whose results fail to match their financial investment or those that do not foster free markets are increasingly becoming politically unacceptable.

To foster their survival, major development agencies are focusing on achieving self-sustaining successes with their aid programs. This requires the rapid ascendency of the private sector. A carefully watched model is USAID's Support for Eastern European Democracy (SEED) program. Under SEED, donor funds are funneled through a development bank as seed money to reduce the risk of private sector investment. The money is loaned or given to private entrepreneurs rather than provided as outright grants to foreign governments. The rationale is that direct involvement of investors will help to discipline business activities, thereby increasing the probability of success and justifying such aid programs.

This change in donor behavior undermines the hopes and expectations of the Ethiopian cotton textile sector. Donor funds for capital investment represent the only source targeted by existing enterprises, and they expect to prevail on foreign governments based on the desperateness of their situation. Instead, they must convince potential investors of their financial viability, technical and marketing ability, and general business acumen. This reality requires paying careful attention to policies that improve the investment climate such as appropriate currency regulations, labor laws, property rights, and information gathering and dissemination. The government must focus on enabling the private sector to compete for investment funds, rather than competing with the private sector by obtaining donated funds or diverting scarce national resources into these uncompetitive enterprises.

The structural changes emphasized in this report cannot be avoided if an open and competitive cotton textile sector is to result in Ethiopia. Proper structural foundations laid by the government will result in improved performance and increased prosperity over time. The following eight strategic recommendations will prepare the way for a viable, competitive Ethiopian cotton textile sector:

- Examine how existing enterprises stand with regard to legal criteria for viability outlined in Public Enterprise Proclamation No. 25/1992. For those that are not viable and cannot be made viable through debt forgiveness or other means, establish a plan for dissolution or down-sizing that includes meeting social obligations to workers.

- Examine, on a national scale, infrastructure requirements (including energy, transportation, communication, etc.) and set priorities for Ethiopia for the next decade. Examine the implications of these priorities for the textile sector and incorporate them into plans relating to cotton and textiles.

- Examine import and export tariffs and quotas to set them at levels that enable competitive activities by businesses and consistent enforcement by the customs service. As a component of the total import/export policy mix, include provisions for free trade zones.

- Develop and implement regulations on communications technology that allow businesses to participate freely, without being disadvantaged relative to other domestic and foreign competitors.

- Develop and implement private property rights, including allowances for land ownership and expanded foreign ownership. Hasten to enable owners of farms to prevent damage from livestock grazing or from other types of unlimited access to the farm land.

- Establish copyright protection laws sufficient to ensure that designs and product constructions cannot be copied by other businesses unless adequate royalties are paid to owners.

- Undertake campaigns to educate key institutions—such as courts, banks, customs service, etc.—about the current status and modus operandi of public sector enterprises.

- Establish the basic market data and information needed by businesses in Ethiopia, then develop an appropriate information gathering and disseminating system.

Persuasive movement by the government on these strategic recommendations would provide the foundation for more directed actions fostering improved conduct and performance of the cotton textile sector. Ten tactical recommendations are emphasized in this regard:

- Concentrate on learning to respond to and exploit the domestic market before assuming an export emphasis.

- Make financial documentation more accurate and transparent so managers can make decisions to enhance profitability; restore integrity to the accounting and financial conventions that have been adopted as a matter of government policy. Hasten to alter the accounting for spare parts to reveal the true cost of spare parts inventories.

- Call in or write off accounts receivable and explore the feasibility of writing off some accounts payable. A sector-wide clearing-house empowered by the government could assist in these actions.

- In preparation for making each enterprise responsible for its survival, undertake a systematic examination of each enterprise's debt situation, determine how much of its debt will be forgiven and taken over by the government, and remove the liability from the financial statements.

- For each public enterprise determined to be viable, assist in the identification and funding of education and training programs in technical, marketing, and management areas. As early as possible, extend the availability of these programs to private sector personnel; the treatment of public versus private enterprises in cotton, textile, and apparel should disappear over the next few years.

- Make it clear to both management and labor that their success depends on their contribution toward the economic success of the enterprises, rather than on the exercise of bureaucratic power. Take steps to de-emphasize the management-by-committee approach and to emphasize individual initiative. Base promotions from within the enterprises on performance and demonstrated potential; prohibit bureaucratic interference with the promotion process and with the setting of salary levels.

- Strive to maximize cooperation with existing or potential private sector enterprises. To the extent that small private enterprises result from the down-sizing or dissolution of some public sector enterprises, they should be encouraged to do business with each other and with larger enterprises in the public and private sectors.

- For each public enterprise determined to be viable, implement recommendations for improving the technical conditions identified in this report. In every case, establish a cleaning and maintenance program that is routinely monitored by management.

- For each public enterprise determined to be viable, obtain assistance to help it undertake a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis of the enterprise. This will take weeks to accomplish under expert guidance. It should yield a conclusion on which market segment(s) should be targeted and a mission statement on how each segment will be served.

- Following the execution of the SWOT analysis, each enterprise should establish a marketing strategy and make a plan of action for executing it that includes a detailed budget.

14

SECTION I

INSTITUTIONAL FRAMEWORK AND STRUCTURE

SECTION I
INSTITUTIONAL FRAMEWORK AND STRUCTURE

This section describes key features of Ethiopia's cotton textile sector. The industry as defined includes the following activities: cotton production, spinning, fabric formation (weaving and knitting), dyeing and finishing, and cutting and sewing (ready-made garments and other textile products).

In the past, Ethiopia has had an unregulated peasant sector that produced relatively small amounts of cotton that were used in hand-looms to weave traditional, low quality textiles. This tradition persists today, with unofficial estimates of hand-loom production as high as 20 percent of Ethiopia's total fabric production. However, data on this segment of the cotton textile sector is practically non-existent. The importance of hand weaving has almost certainly declined in recent years, due to the vastly increased availability of donated, second-hand clothing and the increased availability of imported textile products. Anecdotal evidence indicates that increasing amounts of peasant-grown cotton are entering commercial textile channels. A number of privately held commercial cotton farms supply commercial textile channels. However, public sector enterprises that produce cotton provide approximately half of the domestically produced cotton to commercial textile channels in Ethiopia.

A chronological summary of the establishment of enterprises in Ethiopia's public cotton textile sector is given in Exhibit I-1. The oldest commercial textile manufacturing enterprise is the Dire Dawa Textile Factory, established in 1939. All other textile manufacturing enterprises were established during the 1950s, 1960s, 1980s and 1990s. Three of the agriculture enterprises were established in the 1960s and one (Tendaho) was established in 1985. None of the enterprises were established during the 1940s or 1970s.

Before 1974, foreign interests were involved in the largely privately owned commercial textile sector. After nationalization in 1974, the sector was transformed into a centralized political bureaucracy with no semblance of autonomy. In 1992, the Transitional Government of Ethiopia (TGE) changed its legal status with Public Enterprise Proclamation No. 25/1992, which charged the government with the responsibility to operate in a manner consistent with open-market competition, until the enterprises were privatized. The commercial textile sector today remains almost entirely in the public sector; none of the pre-existing public sector enterprises have been privatized. Although some small, privately held garment manufacturing enterprises are in operation, there are no privately held spinning and weaving enterprises of any consequence.

The following discussion analyzes the public cotton textile sector, its role in the domestic economy, and its structural organization. The section concludes by focusing on the importance of structural change to achieve the performance desired from the public cotton textile sector.

Exhibit I-1. Chronology of Establishment of Existing Public Sector Textile Manufacturing Enterprises in Ethiopia

1939: Dire Dawa Textile Factory	1963: Akaki Garment Factory
1953: Edget Yarn Factory	1966: Nefas Silk Sewing Thread Factory
1956: Akaki Textile Factory	1967: Middle Awash Agric. Dev. Enterprise
1958: Addis Garment Factory	1983: Gulelie Garment Factory
1961: Adei Abeba Textile Factory	1985: Tendaho Agriculture Dev. Enterprise
1961: Bahir Dar Textile Factory	1986: Kombolcha Textile Factory
1961: Abobo Agriculture Dev. Enterprise	1989: Awasa Textile Factory
1961: North Omo Agriculture Dev. Enterprise	1991: Arba Minch Textile Factory
1963: Debre Birhan Blanket Factory	1992: Nazareth Garment Factory

A. Role of the Cotton Textile Sector in Ethiopia's Economy

The cotton textile sector in Ethiopia ranks among the country's largest industries. The latest official data available from the government indicates that in 1990 textile manufacturing was second only to food manufacturing in the gross value of production, but it ranked first in both wages and salaries and fixed capital assets (Exhibit I-2). While the textile sector accounted for 18 percent of the total gross value of production from manufacturing, it accounted for 36 percent of the total wages and salaries and for 30 percent of the total fixed capital assets.

Except for the tobacco sector, the textile sector had the least private sector involvement (Exhibit I-2). The public enterprises accounted for 98.7 percent of both the gross value of textile production and the wages and salaries paid by the textile sector, and for almost all (99.8 percent) fixed capital assets.

All manufacturing accounted for about 8.0 percent of the 1990 Gross Domestic Product (GDP) in Ethiopia; therefore, textile manufacturing accounted for only about 1.4 percent of GDP in that year. By 1992, the last year for which GDP data are available, the share for all manufacturing had dropped to 5.9 percent (Exhibit I-3). The share for textile manufacturing was quite likely below 1.0 percent in 1992.

Over the past 20 years, the cotton textile sector has become a repository for a relatively large number of workers. Government data as of 1990 reveal that textile manufacturing is the largest employer of all the industrial groupings reported (Exhibit I-4). Taken with apparel manufacturing, the sectors' employment accounted for about 40 percent of total manufacturing employment in Ethiopia. Food and beverage manufacturing accounted for another 28 percent, leaving 32 percent for all other manufacturing categories combined. Total manufacturing employment was 82,379 people, with 94.4 percent in the public sector. In textile manufacturing,

Exhibit I-2: Measures of Sectoral Contributions to Manufacturing in Ethiopia, by Ownership, 1990 (in 1,000 Birr)

Gross Value of Production

Sector	Total	Public		Private	
		Amount	Share	Amount	Share
Textile	451,925	446,266	98.7%	5,659	1.3%
Food	657,836	630,195	95.8%	27,641	4.2%
Beverage	434,279	425,549	98.0%	8,730	2.0%
Leather and footwear	242,370	226,821	93.6%	15,549	6.4%
Tobacco	182,037	182,037	100.0%	--	0.0%
Chemical	149,108	143,148	96.0%	5,960	4.0%
Metal and electrical	145,776	140,826	96.6%	4,950	3.4%
Non-metallic mineral products	72,706	69,913	96.2%	2,793	3.8%
Printing	63,120	58,167	92.2%	4,953	7.8%
Wood and furniture	48,759	37,973	77.9%	10,786	22.1%
Paper	38,186	37,173	97.3%	1,013	2.7%
TOTAL	2,486,102	2,398,068	96.5%	88,034	3.5%

Wages and Salaries

Sector	Total	Public		Private	
		Amount	Share	Amount	Share
Textile	97,364	96,133	98.7%	1,231	1.3%
Food	49,147	45,977	93.5%	3,170	6.5%
Beverage	27,896	27,452	98.4%	444	1.6%
Leather and footwear	22,264	21,046	94.5%	1,218	5.5%
Tobacco	3,987	3,987	100.0%	--	0.0%
Chemical	14,790	13,418	90.7%	1,372	9.3%
Metal and electrical	17,610	15,990	90.8%	1,620	9.2%
Non-metallic mineral products	8,718	7,851	90.1%	867	9.9%
Printing	12,143	10,314	84.9%	1,829	15.1%
Wood and furniture	13,426	10,489	78.1%	2,937	21.9%
Paper	4,830	4,566	94.5%	264	5.5%
TOTAL	272,175	257,223	94.5%	14,952	5.5%

Fixed Capital Assets

Sector	Total	Public		Private	
		Amount	Share	Amount	Share
Textile	251,049	250,430	99.8%	619	0.2%
Food	141,980	138,511	97.6%	3,469	2.4%
Beverage	69,587	69,261	99.5%	326	0.5%
Leather and footwear	31,011	27,811	89.7%	3,200	10.3%
Tobacco	3,896	3,896	100.0%	--	0.0%
Chemical	24,733	23,130	93.5%	1,603	6.5%
Metal and electrical	174,312	172,411	98.9%	1,901	1.1%
Non-metallic mineral products	119,216	118,369	99.3%	847	0.7%
Printing	9,118	7,241	79.4%	1,877	20.6%
Wood and furniture	8,856	6,461	73.0%	2,395	27.0%
Paper	5,364	5,037	93.9%	327	6.1%
TOTAL	839,122	822,558	98.0%	16,564	2.0%

Source: Ethiopia Statistical Abstract, 1992.

Exhibit I-3. Gross Domestic Product by Sectors at Constant Factor Cost of 1980/81 (Million Birr)

Sector	1988	1989	1990	1991	1992
Agriculture and allied activities					
Agriculture	3,679.6	3,761.3	3,764.2	4,080.3	3,901.6
Forestry	237.0	242.9	249.0	255.2	261.6
Hunting and fishing	7.1	7.2	7.3	7.7	6.0
Sub-total	3,923.7	4,011.4	4,020.5	4,343.2	4,169.2
Industries					
Manufacturing	757.9	770.7	736.5	539.4	503.4
Handicraft & small-scale ind.	357.0	365.9	357.0	349.9	360.4
Building & construction	377.9	359.8	322.2	257.8	229.2
Electricity & water	98.9	102.0	106.7	102.1	99.0
Mining & quarrying	13.2	13.4	14.4	39.9	34.4
Sub-total	1,604.9	1,611.8	1,536.8	1,289.1	1,226.4
Distributive Services					
Wholesale & retail trade	1,025.8	1,049.6	1,005.1	928.4	872.9
Transport & communication	570.3	577.8	561.7	501.2	498.3
Sub-total	1,596.1	1,627.4	1,566.8	1,429.6	1,371.2
Other Services					
Public administration & defense	829.2	858.3	895.8	901.0	465.8
Banking, Insurance & real estate	408.1	381.5	366.0	322.4	338.5
Educational	261.7	275.4	281.6	269.5	288.4
Ownership of dwellings	236.1	238.5	244.5	249.4	255.6
Domestic	73.1	73.9	74.6	75.4	76.2
Medical & health	69.8	71.8	73.9	68.4	75.9
Others	196.4	197.9	200.9	205.9	212.1
Sub-total	2,074.4	2,097.3	2,137.3	2,092.0	1,712.5
TOTAL	9,199.1	9,347.9	9,261.4	9,153.9	8,479.3
SHARES					
Agriculture and allied activities	42.7%	42.9%	43.4%	47.4%	49.2%
Industries	17.4%	17.2%	16.6%	14.1%	14.5%
Manufacturing	*8.2%*	*8.2%*	*8.0%*	*5.9%*	*5.9%*
Distributive services	17.4%	17.4%	16.9%	15.6%	16.2%
Other services	22.6%	22.4%	23.1%	22.9%	20.2%

Source: Ethiopia Statistical Abstract, 1992.

Exhibit I-4: Number of Sectoral Employees Relating to Manufacturing in Ethiopia, by Ownership, 1990

Sector	Total	Public		Private	
		Amount	Share	Amount	Share
Textile manufacturing	28,489	28,241	99.1%	248	0.9%
Spinning , weaving & finishing	24,930	24,894	99.9%	36	0.1%
Cordage, rope, twine & netting	3,354	3,347	99.8%	7	0.2%
Knitting	205	--	0.0%	205	100.0%
Apparel manufacturing (excluding fur)	4,584	4,424	96.5%	160	3.5%
Food manufacturing	15,450	14,001	90.6%	1,449	9.4%
Beverage manufacturing	7,837	7,718	98.5%	119	1.5%
Leather, luggage & handbag manufacturing	3,655	3,509	96.0%	146	4.0%
Footwear manufacturing	2,943	2,568	87.3%	375	12.7%
Printing and printing services	3,193	2,822	88.4%	371	11.6%
Wood & wood products manufacturing (excluding furniture)	2,488	2,323	93.4%	165	6.6%
Furniture manufacturing	1,661	1,015	61.1%	646	38.9%
Paper and paper products manufacturing	1,280	1,215	94.9%	65	5.1%
Tobacco products manufacturing	868	868	100.0%	--	0.0%
Industrial chemicals (excluding fertilizers & nitrogen compounds)	177	177	100.0%	--	0.0%
Other chemical products manufacturing	1,589	1,447	91.1%	142	8.9%
Rubber products manufacturing	840	777	92.5%	63	
Plastic products manufacturing	870	870	100.0%	--	0.0%
Glass & glass products manufacturing	320	320	100.0%	--	0.0%
Other non-metallic mineral products mfg.	2,954	2,582	87.4%	372	12.6%
Basic iron & steel manufacturing	1,144	1,144	100.0%	--	0.0%
Fabricated metal products manufacturing (excluding machinery & equipment)	1,353	1,088	80.4%	265	19.6%
Pumps, compressors, taps & valves mfg.	169	169	100.0%	--	0.0%
Primary batteries manufacturing	99	99	100.0%	--	0.0%
Assembly of motor vehicles	416	416	100.0%	--	0.0%
TOTAL	82,379	77,793	94.4%	4,586	5.6%

Source: Ethiopia Statistical Abstract, 1992.

20

99.1 percent of employment was in public enterprises, while 96.5 percent of employment in the apparel sector was in public enterprises.

Employment in the textile enterprises rose even as the sector's share of GDP was declining. The apex of total employment in the public sector cotton textile enterprises occurred around 1991, before liberalization by the TGE. A total of about 37,561 people were then employed in seventeen enterprises (Exhibit I-5). By early 1996, total employment had been reduced to about 30,061 people in 18 enterprises—a net reduction of 7,500 people. The only enterprise added during this time was the Nazareth Garment Factory.

Most of the reduction in textile manufacturing employment was due to four integrated textile manufacturing enterprises: Adei Abeba, Akaki, Bahir Dar, and Dire Dawa. Most of the reduction in agricultural employment came from three agriculture development enterprises: Middle Awash, Abobo, and North Omo. The large drop in Middle Awash employment was caused by disposing of three of the original five farms associated with that enterprise. The decrease in North Omo's employment would have been greater except for a merger with South Omo Enterprise, the result of a failed joint venture between Ethiopia and North Korea.

Approximately 58 percent of the total reduction in employment was due to the agriculture development enterprises (see Exhibit I-5). The integrated textile manufacturing enterprises and the yarn manufacturers and finishers taken together accounted for about 48 percent of the total reduction, while garment manufacturers actually increased employment. As a result, the *share* of total employment in the public cotton textile sector contained in all textile-related enterprises *increased* from 77 percent in 1991 to 86 percent in 1996, while the share contained in the agricultural enterprises decreased from 23 percent to 14 percent.

B. Structural Organization of the Public Sector

The official legal status of all public sector enterprises is set forth in Public Enterprise Proclamation No. 25/1992, published on August 27, 1992, in the *Negarit Gazeta* of the Transitional Government of Ethiopia (51st Year, no. 21, pp. 124-138). In the preamble to this proclamation, two foundational statements are made. They are as follows (italics added for emphasis):

> WHEREAS as long as public enterprises have to stay under government control, it is necessary to create an organizational structure *whereby they can enjoy management autonomy* and thus enable them to be *efficient, productive and profitable* as well as to strengthen their capability to operate by competing with private enterprises;
>
> WHEREAS there has to be a legal framework under which public enterprises, *other than those which have to stay under government control*, are operated be it with the participation or under the full ownership of private investors pursuant to the new economic policy.

The proclamation is clear on the following points:

- The intent is to structure the controlling mechanisms of the enterprises so that they are managed autonomously; i.e., without political interference.

Exhibit I-5. Employment Levels in the Public Cotton Textile Sector of Ethiopia

Enterprises	Number of Employees	
	Mid 1991	Early 1996
Integrated Textile Manufacturers		
■ Adei Abeba Textile Factory	3,952	3,629
■ Akaki Textile Factory	6,778	4,878
■ Arba Minch Textile Factory	541	915
■ Awasa Textile Factory	1,169	1,260
■ Bahir Dar Textile Factory	2,825	2,507
■ Debre Birhan Blanket Factory	846	902
■ Dire Dawa Textile Factory	6,199	4,837
■ Kombolcha Textile Factory	2,367	2,306
	24,677	21,234
Yarn Manufacturers & Finishers		
■ Edget Yarn Factory	956	867
■ Nefas Silk Sewing Thread Factory	479	415
	1,435	1,282
Garment Manufacturers		
■ Akaki Garment Factory	1,578	1,471
■ Addis Garment Factory	469	447
■ Gulelie Garment Factory	787	661
■ Nazareth Garment Factory	NA[1]	725
	2,834	3,304
Cotton Producers		
■ Abobo Agriculture Development Enterprise	270	199
■ Middle Awash Agriculture Development	5,003[2]	1,349
Enterprise	1,825[3]	1,658
■ North Omo Agriculture Development Enterprise	1,517	1,035
■ Tendaho Agriculture Development Enterprise	8,615	4,241
TOTAL EMPLOYMENT	37,561	30,061

[1]Established in 1992.
[2]In 1991, this enterprise consisted of 5 farms; subsequently, 3 were given away.
[3]As of November 30, 1994, there were 229 additional employees due to a merger with South Omo Agriculture Development Enterprise.
Source: Textile Task Force, PESA.

- The intent is that the enterprises have the primary goal of achieving efficiency, productivity, and profitability, i.e., that they become competitive in open, unprotected markets.

- It is assumed that some of the enterprises will stay under government control, i.e., that they will not be privatized.

The official chain of command runs from a supervising authority to a management board to a general manager. The following briefly considers each.

Supervising authority

This is "designated by the Council of Ministers with a view to protecting the ownership rights of the State." The Public Enterprises Supervising Authority (PESA) was formed to fulfill this function. It is empowered to:

- Appoint and remove members of the board
- Appoint the chairman of the board
- Fix the allowances paid to the members of the board
- Appoint external auditors
- Cause the allocation of the initial capital of the enterprise
- Decide the increase or decrease of the capital of the enterprise
- Cause the establishment of reserve funds or the allocation of funds by the Government so that the authorized capital of the enterprise shall be fully paid up.
- Determine the amount of state dividend to be paid to the Government from the net profits of each financial year
- Approve financial reports of the enterprise and external audit reports
- Approve the investment plan of the enterprise
- Propose the dissolution, amalgamation, or division of an enterprise under its control, or the transfer of the enterprise or its management in any other manner
- Approve the annual and long-term corporate targets of the enterprise and follow up their fulfillment
- Without prejudice to the powers and duties given to the Board, perform other functions necessary

Management board

The head of PESA must allow at least 3 board members and may allow up to 12 members, *with not more than one-third of the members elected by the general assembly of the workers.* Their term of office, unless removed by the PESA, is at least three years and not more than five; however, it is permitted to reappoint for successive terms. The powers and duties delegated to the board are to:

- Decide on policy issues other than those to be submitted to the PESA

- Appoint and dismiss the general manager of the enterprise and fix his salary and allowance

- Approve the employment, assignment, and dismissal of those officers of the enterprise accountable to the general manager, including their salaries and allowances

- Approve the internal regulations of the enterprise as well as it work programme and budget

- Approve the long-term loans and credits of the enterprise

- Approve the sale of fixed assets

- Ensure that proper books of accounts are kept for the enterprise

- Submit books of account to the auditors of the enterprise, and periodic reports on the state of activities of the enterprise and financial reports to the PESA

- Propose to the PESA the increase or decrease of the capital of the enterprise

General manager

Accountability of the general manager is to the board. Delegated responsibilities are to:

- Organize, direct, administer, and control the enterprise

- Represent the enterprise in all dealings with third parties and in legal proceedings brought by or against it

- Subject to the approval of the board, employ, assign, and dismiss the officers of the enterprise accountable to him and define their functions

- Employ, assign, and dismiss other employees of the enterprise in accordance with the internal regulations of the enterprise and the appropriate law, and determine their salaries

- Keep proper books of accounts of the enterprise, and open and operate bank accounts to the enterprise

- Enter into short-term loan contracts for the purpose of providing the working capital of the enterprise, borrow money on a long-term basis with the approval of the board, and for those purposes pledge or mortgage the movable or immovable property of the enterprise

- Prepare and submit to the board the internal regulations as well as the work program and budget of the enterprise, and implement same upon approval

- Sell fixed assets with the approval of the board

- Implement and cause the implementation of the decisions of the board

- Submit report to the board in such manner as it shall prescribe

- Delegate his powers to the officers and other employees of the enterprise to the extent deemed necessary

- Establish and preside over the meetings of a management committee that shall advise on the operations of the enterprise and that may discuss the progress, plans, and decisions of the enterprise

- Perform other duties assigned to him by the board

The result of the foregoing powers and duties of this chain of command is to create a public sector rooted in the top hierarchy of national politics, which will in turn subvert the objective to have the enterprises managed autonomously. No structure is in place to insulate management decisions made for the purpose of profit from the political pressure to serve social welfare objectives. For example:

- Even if the head of PESA is staunchly committed to the necessary changes, political pressures from the Council of Ministers make it unlikely that the objectives of "efficiency, productivity, and profitability" will overrule politically sensitive issues such as employment, government revenues, and foreign exchange earnings.

- The appointed boards are likewise subject to intense political pressures. They do not bring in-depth expertise relevant to the needs of the newly liberalized enterprises. With one-third of the board members made up of worker representatives, over three-fourths of the remaining board members must be willing to override the labor vote if a substantial reduction in workers is to be approved. Again, this is unlikely—unless there are incentives such as early retirement or extraordinary severance arrangements. (All significant workforce reductions to date have been based on such special conditions.)

- Finally, the general manager is clearly not empowered to take unilateral action on labor issues. Unless the board has been thoroughly recruited beforehand, a proposal by the general manager for significant action regarding workers would endanger his position in the enterprise. Indeed, given the volatile nature of public sector laborers, almost *any* initiative regarding labor force adjustments will pose a risk to the general manager's position in a public sector enterprise.

The position of the general manager is structurally very weak. Unless the general manager has universally recognized expertise or extraordinary political power, he will not survive repeated controversial decisions. Unfortunately, most decisions aimed at transforming an inefficient state enterprise into an efficient competitor are somewhat controversial. Because a general manager does not expect to survive the changes necessary to make the enterprise economically viable, he has no economic incentive to undertake such changes. He will try to balance bureaucratic and political interests, neither of which have as their priority the achievement efficiency, productivity, and profitability.

The experience of other countries has shown that the only two factors that make enterprises more efficient are the threat of imminent privatization and the threat of imminent dissolution.

Although Public Enterprises Proclamation No. 25/1992 puts forth no conditions regarding privatization, it does provide the grounds for dissolution. Any one of the following reasons are sufficient for dissolution of an enterprise:

1. The expiry of the life of the enterprise as fixed in its establishment regulations
2. Completion of the venture for which the enterprise was established
3. **Failure of the purpose or impossibility of performance**
4. **Loss of seventy five percent (75 percent) of the paid up capital of the enterprise**
5. A decision of the Council of Ministers affecting the existence of the enterprises
6. **Decision of the court declaring the enterprise bankrupt**

Numbers 3, 4, and 6 are emphasized because they provide practical ways for an enterprise to be brought to the point of dissolution.

In case of dissolution, the assets of an enterprise are used to pay off its debts; an enterprise cannot be held liable for debts in excess of the value of its assets. The proclamation states, "Where the total assets of the enterprise are not sufficient to pay off its debts and the authorized capital is not fully paid up, the liquidators shall ask the supervising authority for the full payment of the capital" (136). It also states that "Any surplus assets of an enterprise dissolved and liquidated shall devolve to the Government" (137).

C. Importance of Structural Change

The previous section points out that the control structure codified in the law is inconsistent with the stated objective of having the public sector enterprises perform efficiently, productively, and profitably. This illustrates how the performance of entities within an economy follow from the conduct of the people within them, which in turn are determined by the structure within which the entities are required to operate. Thus, the dominant direction of cause-and-effect runs from structure to conduct to performance.

Government attempts to affect an industry's performance (efficiency, productivity, profitability, etc.) directly cannot succeed unless structural factors are arranged to alter the conduct of people. People's altered conduct will inevitably lead to altered performance within the economic entities they influence, and eventually the effects will spread throughout the entire economy.

A country whose government spends its scarce resources preparing a structure that facilitates the growth and development of business activity will progress faster than a country whose government spends its resources to fund the direct establishment of businesses. Giving priority to providing roads and electricity to benefit any business that is started, rather than providing buildings and equipment directly to specific businesses, will result in more economic growth.

Likewise, establishing institutional structures to facilitate and reward the productive activity of a country's citizens, rather than imposing institutional barriers that suppress business initiative, will hasten economic development. For example:

- A common phenomenon in developing countries is for its customs service to become one of the largest sources of central government revenues. Tariff rates and customs service should be carefully structured to focus on the fair enforcement of trade laws and the timely clearance of legal imports and exports; otherwise, the purpose of the customs process is solely to collect more revenues, legally and illegally. Such obstruction increases the cost and risk of doing business and distorts legitimate business conduct, costing a country more in lost business revenues than are collected in tariffs. From a political standpoint, this large net loss is allowed to continue because the loss to the economy is difficult to measure, while the tariff revenues are easy to measure and easily claimed by the central government.

- Developing countries commonly require enterprises (both public and private) to include most of the cost of a social welfare system in the cost of doing business. If businesses are required to bear the cost of these liabilities, both the average cost and the risk of doing business goes up and less business is accomplished. Pay levels must also be reduced to offset the added cost of funding the welfare system. The net result is less employment, lower salaries and wages, less tax revenues, more poverty, etc.

Governments historically have the responsibility of the civil infrastructure of the country. Civil infrastructure refers to the major construction necessary to facilitate all forms of commerce, including energy generation and distribution; roads, waterways and airports to enable transportation and product distribution; and wires, satellites, and booster stations to enable communication. This infrastructure is in the government's domain because everyone benefits from these facilities yet no one can afford to build them for private use. Using tax revenues is therefore appropriate to fund their construction and maintenance. Their availability is necessary for cost-effective, reliable production, as well as for timely delivery of products and good customer service.

One aspect of infrastructure that has not traditionally been a high priority of most governments, but is now a dominant force in economic and social arenas, is the generation and collection of data and other information. Governments that do not enable their people and businesses to get and give information will put them at a comparative disadvantage in global competition. A hundred years ago the textile industry was labor and capital intensive; twenty-five years ago it was capital intensive; now it is information intensive. The number of people operating machinery in textile factories has dropped rapidly as output capacity has increased. Low wage rates have ceased to be a driving force in the location of textile manufacturing, especially in spinning and weaving. This is because the *structure* of textile manufacturing has changed.

The importance of structural change—moving from structure to conduct to performance—has withstood testing throughout history and across cultures. Attempts to change either the conduct or the performance of an economic sector in ways that are inconsistent with structural factors have always proven futile. As this report is read in its entirety, the reader is asked to keep in mind the structural issues introduced here. They will be revisited in many different contexts relevant to the public cotton textile sector.

SECTION II

FINANCIAL EVALUATION OF PUBLIC COTTON/TEXTILE SECTOR

SECTION II
FINANCIAL EVALUATION OF PUBLIC COTTON/TEXTILE SECTOR

This section examines the financial condition of the 18 government-owned textile sector enterprises: four cotton farms, ten textile factories, and four garment factories. It first discusses policy issues pertinent to finances, considers sector-wide accounting/financial factors that impact these enterprises, and analyzes the sector's and the individual enterprises' financial performance.

Annex A contains the balance sheets and income statements of the 18 enterprises for the last three fiscal years, including 1992-93 through 1994-95, and the results of financial ratios used to assess the financial soundness of business enterprises. Annex B provides a case study of the Dire Dawa Textile Factory.

A. Financial Policy Issues

Five major policy areas are relevant to the financial condition of these public enterprises: government control, land ownership, collateral, banking structures and practices, and taxes. The impacts of these policies are widespread, but they will be emphasized in this section.

A1. Government Control

Between 1974 and 1992, the entire cotton/textile sector was exclusively owned and managed by the central government of Ethiopia. Management decisions were made from the top down and dominated by political expediency and bureaucratic self-interest. By 1992, the financial condition of the sector was no longer viable.

In 1992, the new Government of Ethiopia began a transition process to move the cotton/textile sector toward economic viability. The Public Enterprises Proclamation No. 25/1992 states, "Whereas as long as public enterprises have to stay under government control, it is necessary to create an organizational structure whereby they can enjoy management autonomy and thus enable them to be efficient, productive and profitable as well as to strengthen their capability to operate by competing with private enterprises." The proclamation also mandated good accounting standards, stating, "Each enterprise shall keep books of accounts following generally accepted accounting principles," and "the accounts of each enterprise shall be audited by external auditors."

An enterprise supported by government interventions and constrained by sociopolitical objectives will have difficulty behaving like a for-profit private enterprise. Unfortunately, for reasons discussed elsewhere in this report, autonomous management has not been realized in the Ethiopia textile sector, and the painful actions necessary to achieve private-sector efficiency, productivity, and profitability have not been taken. Symptoms abound of the lack of autonomous management—no doubt exacerbated by a lack of management experience. For example, the nationalized industry benefited from government requirements for military uniforms, and garments for party members and higher salaried government employees. This practice ceased by 1991, yet the output of finished twill fabric appropriate for these uniforms continued until 1995.

19

A2. Land Ownership

With rare exceptions, Ethiopian land is owned exclusively by the government. Without exception, land cannot be freely bought and sold by private citizens. Under international standards of valuation, the only way to establish the meaningful value of land is through a functioning land market, which Ethiopia does not have. Furthermore, the inability to transfer land inevitably causes the devaluation, as far as the *market* is concerned, of any fixed improvements located on the land.

Government land ownership is therefore detrimental to the financial position of Ethiopian enterprises. Well developed and consistently implemented lease laws may partially alleviate these problems. While lease laws do exist in Ethiopia, they are fairly new and not completely implemented.

Three problems are evident concerning the privatization of these enterprises:

- **It is practically impossible to determine operational expenditures.** While the central government handles the sale of enterprises, the regional government where the factory is located establishes all rental charges for land use. But no legal/institutional structure sets rental charges, and existing precedents often penalize potential entrepreneurs in Ethiopia. The cotton farm in Middle Awash, for example, is charged 30 percent of the value of cotton produced for land use by the Afar tribe based on claims of traditional land rights.

- **It is practically impossible to use land as collateral for loans.** Banks refrain from loaning money based on land collateral that cannot be claimed if the loan is defaulted. This denies Ethiopian enterprises the option of borrowing funds for expansion and modernization.

- **It is practically impossible to establish a net worth figure.** The only acceptable valuation for the land would be zero. Moreover, few improvements to the land would retain substantial market value after 10 years.

A3. Collateral

There are other collateral limitations in Ethiopia besides land. As do banks in other countries, Ethiopian banks recognize only those items that can be registered as collateral with the local government authorities. Buildings and motor vehicles can now be registered with the government, but factory equipment cannot. Therefore, private firms cannot use land and equipment as collateral and must rely on buildings, motor vehicles, or other personal collateral to raise funds for modernization or expansion.

A4. Banking Structure and Practices

In the Ethiopian banking sector, three banks provide most banking services to textile enterprises. They include:

- **The Development Bank of Ethiopia (DBE)** provides long-term loans to the textile sector. Most of those loans are now past due and in default (see discussion on long-term loans).

- **The Commercial Bank of Ethiopia (CBE)** provides short-term loans to the textile sector, primarily as bank overdrafts. These overdrafts are used to provide cash flow and cover industry operating losses (see discussion on overdrafts).

- **The National Bank of Ethiopia (NBE)** fixes the interest rate for borrowing. The current maximum ceiling is 16 percent per annum, with the rate permitted to go as low as 13 percent.

Private banks are new and may play a limited role in expanding or modernizing the private sector. Although they have no legal restrictions, their activities are limited by lack of capital and the newness of their operations.

A5. Taxes

The government imposes at least six different sets of taxes on these enterprises: sales, excise, pension, payroll, customs, and profit taxes (Exhibit II-1).

Exhibit II-1. Taxes Paid by Factories

Type of Tax	Amount of Tax %
1. Sales tax	12
2. Excise tax	10
3. Employee pension tax:	
Paid by enterprise	6
Paid by employees	4
4. Payroll tax	Paid by employees
5. Customs import tax	12
Raw materials	5
Spare parts	
6. Profit tax	40

The profit tax rate of 40 percent is higher than other East African rates. Some examples include:

Kenya	35 percent
Tanzania	35 percent
Uganda	30 percent
Mauritius	35 percent
South Africa	40 percent

In combination with the taxes summarized in Exhibit II-1, the effective marginal tax rate is too high, precluding healthy financial conditions for enterprises because they cannot retain enough profits to upgrade, expand, or modernize. This tax rate provides an incentive to artificially inflate expenditures to ensure that there is little or no taxable profit and diminishes Ethiopia's attractiveness as a base for large-scale business operations.

B. Major Accounting/Financial Factors

The purpose of this study was to assess whether the financial statements of the cotton/textile enterprises were accurate and in accordance with international accounting standards for expressing income, assets, liability, net worth, liquidity, and debt. An Ethiopian task force working under the Public Enterprises Supervising Authority (PESA) supported this effort.

The accounting system currently used in the textile sector is an acceptable manual system that follows accepted international accounting standards, including a double entry, full accrual bookkeeping system. However, the system has a significant problem, including inaccuracies, improper revaluations of assets, overstatements of assets, and lack of annual audits. Given that current practices are not standardized, financial statements must account for every business transaction using transparent and *conservative* principles, including the following:

- Record transactions using prices and costs prevailing at the time.
- Make adjustments to current values *only* if values decline.
- Record revenues and costs when they are committed, not when cash changes hands.
- Periodically match revenues and costs using accruals, deferrals, and accounting allocations.
- Make careful allowances for negative contingencies, reducing profits and recorded value accordingly.

This report focused on the last three fiscal years of financial data (1992-1993, 1993-1994, and 1994-1995). The consultants for this report cross-checked figures in the data with sample plants such as Dire Dawa, read financial audits, and contacted independent groups such as the Development Bank of Ethiopia and the Commercial Bank of Ethiopia for independent verification of financial figures.

The investigation clearly indicated that much of the financial data submitted by the textile enterprises contained significant problems. Moreover, significant sections of the internal financial records of the individual enterprises were in error; they did not accurately portray the financial condition of the textile industry. For example:

- Some of the data submitted to the task force contained errors in addition.

- Information in some of the financial statements did not agree with supporting schedules.

- Information concerning profit, work-in-process, and finished goods did not always match profit and loss statements and balance sheets.

- One enterprise submitted data that included negative goods-in-transit.

- Most audits were not current and some had not been completed for the last five years. In the Adei Abeba Yarn Factory 1992 audit, the auditors said, "We are unable to form an opinion as to whether these accounts . . . present fairly the financial position of Adei Abeba Yarn Factory." In 1990, auditors for the Kombolcha Textile Factory were also unable to form an opinion.

Although the above problems are serious and need to be corrected, they are relatively minor when compared to the major asset revaluation and overstatement problems in the financial statements. In fact, auditors of the enterprises have repeatedly questioned asset valuation. For example, the 1993 Dire Dawa audit withheld a figure for stock obsolescence because the factory had "no satisfactory procedure" for determining this amount. Also, the 1992 Adei Abeba audit stated, "Creditors include amounts totaling Br 826,949 which had been outstanding for over one year and in respect of which we obtained no satisfactory explanation for the reason they had not been settled. Consequently we were unable to satisfy ourselves as to the validity of amounts totaling Br 826,949 included under creditors."

This section discusses the factors that could impact the financial situation of the cotton/textile sector. These issues need to be resolved if the sector is to attain economic self-sufficiency.

B1. Legal Liabilities Left by Nationalization

Two financial liabilities—the legacy of nationalization—need to be resolved before the textile sector can make the transition to financial stability. They include the following:

- When some factories were nationalized in 1974-75 and transferred to government ownership, the Government of Ethiopia promised former shareholders fair compensation, which is still outstanding.

- A contingent liability of U.S. $80,974,801 for the textile enterprises, as successors to the former National Textiles Corporation, is presently in legal action.

B2. Fixed Assets

The valuation of fixed assets is perhaps the most troubling aspect of textile sector balance sheets because in January 1993 the Ministries of Finance and Industry told the textile sector to recapitalize enterprises with a negative net worth. The recapitalization occurred in the form of a revaluation of assets, which increased the value of net fixed assets so as to wipe out any accumulated deficits and increase the net worth of the enterprise to a positive figure. This violated accepted accounting procedures and distorted the real financial picture of the enterprises.

The following enterprises were recapitalized in 1993, which resulted in increased values of net fixed assets:

Adei Abeba Textile Factory	Br 24.8 million
Bahir Dar Textile Factory	Br 29.1 million
North Omo Agricultural Development	Br 46.4 million

These increases came about, for example, by arbitrarily decreasing accumulated depreciation (for Bahir Dar), or by revaluing land improvements (for North Omo).

Another, more minor, reason for concern about asset valuation is non-functioning assets. Fixed assets should be stated at cost less accumulated depreciation (with depreciation based on an appropriate schedule). Maintenance, repairs, and minor renewals should be charged to expenses, while major equipment renewals and upgrades are capitalized. In some cases, however, there are no credible procedures for writing off non-functioning equipment. For example, the Dire Dawa

Textile Factory has on its books machinery and equipment which have never been used or have been idle for several years, including five knitting machines (valued at Br 450,846) and five electric boilers (valued at Br 794,399). Even if their book value is nominal, retaining them as assets is misleading. The downsizing of the enterprise is not reflected in the records.

Three methods are used to set asset values:

- **Replacement cost** is the current cost of replacing or reproducing an item, taking into account the normal quantity produced or purchased, geographic location, possible discounts, transportation charges, changes in production costs, and other relevant factors.

- **Resale or market value** of operating equipment is assessed at its new value minus depreciation or at an appraised replacement value for equally used machines. New equipment value is never a basis for sale value.

- **Income potential** as a method of valuation uses discounted cash flow based on current and potential income produced by the equipment. Four main factors affecting this calculation are (1) current profitability, (2) current market share for the enterprise products, (3) current number of active customers, and (4) potential to increase the first three.

All three values should be calculated if possible. For buyers, the last two are the most relevant.

B3. U.S. Cotton

During 1994 and 1995, donated cotton from the United States was given to the Ethiopian textile sector, valued at Br 197 million (approximately US$31 million). The cotton was distributed to textile factories with spinning capabilities, but the total value of the cotton was allocated on a pro rata basis to all twelve textile factories. Furthermore, the stated capital value for each enterprise was increased accordingly (Exhibit II-2). In most cases, appropriate transfer payments from yarn spinning factories to other textile enterprises were not made. Therefore, no increase in value for the rest of the enterprises should have occurred, especially when debtor enterprises are not able to pay.

Exhibit II-2. USA Cotton Fund Capitalization (Thousand Br)

Enterprise	Feb. 1994	July 1995	Total
Adei Abeba Textile Factory	18,070	3,321	21,391
Akaki Textile Factory	18,786	3,452	22,238
Arba Minch Textile Factory	24,810	4,558	29,368
Awasa Textile Factory	14,843	2,727	17,570
Bahir Dar Textile Factory	21,565	3,962	25,527
Dire Dawa Textile Factory	23,320	4,295	27,615
Kombolcha Textile Factory	21,832	4,010	25,842
Edget Yarn Factory	5,624	1,034	6,658
Nefas Silk Sewing Thread Factory	1,814	333	2,147
Addis Garment Factory	2,820	528	3,348
Akaki Garment Factory	8,920	1,638	10,558
Gulelie Garment Factory	3,977	731	4,708
Total	166,381	30,589	196,970

B4. Overdrafts

Ten textile enterprises operate only because they have checking account overdrafts from the Commercial Bank of Ethiopia (Exhibit II-3). These funds make up for shortfalls in cash flow; if CBE were to stop these overdrafts, these enterprises could not operate.

Exhibit II-3. Overdrafts Owed to the Commercial Band of Ethiopia (as of March 25, 1996)

Enterprises	Overdrafts (Million Br)
Adei Abeba Textile Factory	1.8
Akaki Textile Factory	14.4
Arba Minch Textile Factory	3.2
Awasa Textile Factory	3.9
Debre Birhan Textile Factory	8.6
Dire Dawa Textile Factory	8.9
Akaki Garment Factory	3.2
Gulelie Garment Factory	2.1
Kombolcha Textile Factory	12.3
Nazareth Garment Factory	3.3
Total	61.7

Source: Commercial Bank of Ethiopia

The data on overdraft balances in Exhibit II-3 come from CBE and may be different from that obtained from the enterprise's books due to the floating time of transactions performed with non-reconciled CBE bank statements. The same is true for DBE loans.

B5. Long-Term Loans

The Development Bank of Ethiopia has made long-term loans to cotton farms and textile factories to pay for construction and equipment, including long-term loans to 10 enterprises in the amount of Br 530.7 million (Exhibit II-4). Due to the weakened condition of this sector, DBE now considers many of these loans non-performing, with little chance of repayment. The liability for these debts is now being transferred to the Ministry of Finance, with all non-performing farm debts already transferred. The DBE is now transferring the remaining Br 193.6 million in non-performing loans. The Ministry of Finance would then assume the debt and pay DBE the outstanding amounts. Nevertheless, the enterprises would still be liable for their debts unless they are officially forgiven by the Government of Ethiopia.

To date, the Ethiopian Privatization Agency has sold public enterprises debt free, using the cash received from the sale to pay off outstanding liabilities. However, for some of these enterprises, the selling price will probably not cover existing debts. For example, Middle Awash Agriculture Development Enterprise owes Br 135.8 million to DBE, but the farm has a net fixed asset value of only Br 36.3 million. Current assets are also significantly less than current liabilities.

Exhibit II-4. Long-term Loans by the Development Bank of Ethiopia

Enterprises	Amounts Due (Million Br)	Status
Adei Abeba Textile Factory	34.9	Non-performing
Arba Minch Textile Factory	54.7	Non-performing
Awasa Textile Factory	49.3	Non-performing
Bahir Dar Textile Factory	14.0	Non-performing
Kombolcha Textile Factory	40.7	Non-performing
Debre Birhan Blanket Factory	7.5	Performing
Edget Yarn Factory	3.7	Performing
Abobo Ag. Enterprise	14.8	Transferred to Min. of Finance
Middle Awash Ag. Enterprise	135.8	Transferred to Min. of Finance
Tendaho Ag. Enterprise	175.3	Transferred to Min. of Finance
Total	530.7	

B6. Finished Goods Inventories

Some textile enterprises overvalue fabric inventories. Balance sheets reveal that levels of fabric inventories have increased in recent years. For example, Arba Minch Textile Factory presently has 425 days of finished stock available, while the Nazareth Garment Factory has 358 days. As of March 3, 1996, the Dire Dawa Textile Factory had 72 days of such stock available.

Liquidation of these stocks will be accomplished only at a substantial discount of their stated book values. At Dire Dawa, in particular, about half of the finished goods inventory is twill fabric that is many months old. Also, the 1992 audit for Adei Abeba Yarn Factory disclaimed a value for inventory. The auditors stated, "In the absence of a physical inventory of stock on November 9, 1992 on which we could rely for the purposes of our audit we were unable to satisfy ourselves as to the quantity, condition and value of stock included in the balance sheet at Br 17,439,071."

These inventories should be periodically revalued to account for stock obsolescence. Furthermore, excess inventories should be sold as soon as possible, even at a discount, because (1) fabric in storage deteriorates over time, adding to losses, and (2) any large amount of long-term inventory entails interest carrying charges, a reduction in cash flow, or both.

B7. Equipment and Parts Inventories

The financial data corroborates observations made by this project's technical team that some parts inventories are excessive. Furthermore, recent purchases have reached extraordinarily high levels. The Dire Dawa Textile Factory thus has a total inventory of spare parts of Br 22.7

million, but a net fixed asset value of Br 10.6 million. Also, the Awasa Textile Factory had a spare parts inventory of Br 14.6 million at the end of FY 1994-95, an increase of Br 4.7 million over the previous year.

Current accounting practice is to capitalize initial stocks of spare parts purchased with machinery, then depreciate them over time. However, additional spare parts purchased independently of equipment are placed in inventory and carried as assets; they are not expensed until they are actually used. The following steps should be taken:

- Revalue existing spare parts inventory to reflect stock obsolescence.
- Expense additional purchases of spare parts as soon as they go into inventory.
- Use a target figure for spare parts inventory of 7-10 percent of original asset value (after proper account is taken for the impact of devaluation).

Violations of prudent practices in the purchasing of spare parts are egregious; therefore, the public textile sector should implement the conservative practice of expensing them when purchased. Several in the public sector voiced objections about artificially unbalancing financial records if purchases are expensed. If a reasonable number of spare parts are bought for use in a year's time, the impact on the records would be quite negligible because public sector enterprises only release annual reports. Furthermore, year-end adjustments are made that make no difference to the financial statements. If too many spare parts are bought, then the information *needs* to be clearly revealed on the records, so that top management can address the problem. One of the financial accounting principles stated earlier advises that costs be recorded when they are committed, even before payment is actually made.

B8. Accounts Receivable

The textile enterprises have chronically high levels of accounts receivable either with trade debtors or with associated enterprises in the public sector.

Given the age of many of these accounts receivable, they should no longer be classified as short-term debts. For example, the North Omo Enterprise has been carrying Br 8.3 million in accounts receivables from five associated enterprises for the last three years. Other examples are contained in Annex A of this report.

In addition to reclassifying some accounts receivable, they should also be either called in or written off. In some cases, cleaning up the accounts receivable would reveal that the enterprise has a negative net working capital.

B9. Accounts Payable

Several factories have large accounts payable which, like the accounts receivable, are candidates for reclassification as long-term debt. These reveal serious financial problems. For example, Awasa Textile Factory had past due Br 19.4 million in taxes, Br 18.6 million in DBE loans, Br 7.9 million due to associate enterprises, and Br 25.1 million in interest.

To facilitate a resolution of these accounts payable, the government can take the following actions:

- **Allow write offs** of past due taxes and past due interest, if payback is impossible.

- **Provide a clearing house** and a financial expert for two months to clear up the debts owed from one enterprise to another. Many will likely cancel each other out.

B10. Inaccurate Balance Sheets

In view of the foregoing discussion, the cotton/textile sector enterprises clearly overstate the levels of their assets, and thus, the net worth of their enterprise. Based on a more detailed case study of the Dire Dawa Textile Factory, a more realistic balance sheet changes the enterprise's net worth in fiscal year 1994-95 from a positive Br 35.3 million to a negative Br 2.3 million (see Annex B). This is not an exact number, of course, but indicates the direction the net worth estimate should move. Furthermore, the material presented in this and other sections indicates that a careful reassessment of balance sheets would result in decreased net worth estimates for almost all public enterprises in the cotton/textile sector.

C. Sector Financial Performance

The material for this section is found in Annex A, which contains the balance sheets and profit-and-loss statements for each of the 18 public enterprises in the cotton/textile sector. These financial statements are consistent with the ones submitted by the individual enterprises to the PESA task force; only minor corrections were made when it was obvious that the figures did not add up or did not agree with supporting documents. Neither the data submitted by the enterprises nor the statements in Annex A have been audited.

Also included in Annex A is an analysis of the financial data concerning each enterprise, including a statement of financial condition, profitability, net worth, liquidity, a series of ratios, and relevant comments concerning financial problems and issues.

C1. Performance Measures Used

Many of the traditional ratios used to evaluate enterprises, such as return on investment, are not appropriate for the Ethiopian cotton/textile sector because they provide useful, directional information when profitability of the sector is the rule, not the exception.

Under the previous centralized regime, the primary performance measure valued by the government was the number of people employed; a secondary one was the capacity at which the plants operated. Now, however, the primary measurements to evaluate performance are *profit*, *net worth*, and *liquidity*. These three are given for every enterprise in Annex A. Also, for the reader's additional information, several traditional ratios are given. The following summarizes the evaluation indicators computed:

- **Profit.** The excess of selling price over costs or, for a company as a whole, the excess of revenue over all expenses.

- **Net Worth.** The residual equity in an enterprise equal to total assets minus total liabilities. If the enterprise has a negative net worth, it is technically bankrupt.

- **Net Working Capital and Liquidity.** The degree to which a company's assets can be readily converted into cash. Arithmetically, it is equal to current assets minus current liabilities.

- **Overdrafts.** Amount of overdrafts with banks. (All of these are with the CBE.)

- **Long-term loans.** Amount of long-term loans with all other entities. (Most are with the DBE.)

- **Debt-equity ratio.** Total liabilities divided by net worth.

- **Re-valuation of assets.** This section mentions any revaluations that occurred.

- **Liquidity/current ratio.** Current assets divided by current liabilities.

- **Stock turnover rate.** Finished goods divided by net sales multiplied by 365 days.

- **Net margin.** Profit after taxes divided by net sales.

- **Return on assets.** Profit after taxes divided by total assets.

C2. Sector Overview

With respect to fundamental financial indicators, the following summary comments are appropriate:

Profitability

- In FY 1992-93, four enterprises made profits totaling Br 6.1 million, while 14 enterprises suffered losses totaling Br 97.1 million.

- In FY 1993-94, five enterprises made profits totaling Br 8.8 million, while 13 enterprises suffered losses totaling Br 77.9 million.

- In FY 1994-95, four enterprises made profits totaling Br 12.4 million, while 14 enterprises suffered losses totaling Br 77.9 million.

- On average over the last three years, the public cotton/textile industry suffered losses of Br 75.2 million per year.

Note: While it is not possible to sort out the impacts of accounting irregularities on reported profits, it is wise to assume that profits are somewhat overstated and the losses somewhat understated.

Net Worth

- In FY 1992-93, 11 enterprises registered a positive net worth totaling Br 177.9 million, while seven enterprises registered a negative net worth totaling Br 331.0 million.

- In FY 1994-95, 14 enterprises registered a positive net worth totaling Br 271.0 million, while four enterprises registered a negative net worth totaling Br 296.3 million.

Note: The increased aggregate net worth between FY 1992-93 and FY 1994-95 is inconsistent with the industry's non-profitability. This reflects the fact that the net worth figures were artificially increased by asset revaluation and an influx of donated U.S. cotton. There is little doubt that the aggregate net worth figures for FY 1994-95 are greatly overstated. The sector, taken as a whole, is technically bankrupt.

Net Working Capital and Liquidity

- In FY 1994-1995, 12 enterprises had positive net working capital, and 6 had negative net working capital.

- Liquidity is much less than indicated by the net working capital figures, due to the large amounts of funds tied up in non-liquid inventory; i.e., spare parts and long-term accounts receivable.

Long-Term Debt

- At the end of FY 1994-95, 13 of the 18 textile enterprises owed long-term debts totaling Br 807.8 million. Most of this money is owed to the DBE, the Ministry of Finance, and foreign governments.

- An additional Br 185.9 million is owed for interest past due; therefore, principal and interest owed approximates Br 1 billion.

C3. Ranking of Individual Companies

Of the 18 enterprises in the public cotton/textile sector, only one could be given a rating of "financially sound." Five rated as "financially intermediate," and twelve as "financially unsound." In general, the cotton farms and textile factories are in relatively worse condition, while the blanket and garment factories are in relatively better condition.

The enterprises are listed below in the three categories, together with comments on each enterprise. The concerns expressed in the previous section about the accuracy of the financial statements should be kept in mind when using these rankings. These are optimistic, rather than pessimistic, rankings.

Financially Sound

- Debre Birhan Blanket Factory — Profitable, positive net worth, liquid, 12 percent return.

Financially Intermediate

- Addis Garment Factory — Profit in 1995, positive net worth, liquid, 0.6 percent return.

41

• Akaki Garment Factory	Loss in 1995, profit in 1994, positive net worth, liquid.
• Nazareth Garment Factory	Loss in 1994 and 1995, positive net worth, increasing sales.
• Akaki Textile Factory	Loss in 1995, profit in 1994, positive net worth, liquid.
• Edget Yarn Factory	Loss in 1995, profit in 1994, positive net worth, negative liquidity.

Financially Unsound

• Abobo Agriculture Development Enterprise	Not profitable, negative net worth, negative liquidity.
• Middle Awash Agriculture Development Enterprise	Profit in 1995, losses in prior years, negative net worth, negative liquidity, heavy debt.
• North Omo Agriculture Development Enterprise	Not profitable, questionable net worth, negative liquidity.
• Tendaho Agriculture Development Enterprise	Profit in 1995, losses in prior years, negative net worth, negative liquidity, heavy debt.
• Adei Abeba Textile Factory	Not profitable, questionable net worth, questionable liquidity, revalued assets.
• Arba Minch Textile Factory	Not profitable, net worth will be zero in 1997 if current trends continue, heavy debt.
• Awasa Textile Factory	Not profitable, net worth will be zero in 1998 if current trends continue, heavy debt.
• Bahir Dar Textile Factory	Not profitable, questionable net worth, negative liquidity, revalued assets.
• Dire Dawa Textile Factory	Loss in 1995, profit in 1994, negative net worth, negative liquidity, large overdrafts.
• Guleliee Garment Factory	Losses last two years, questionable net worth, liquid.
• Kombolcha Textile Factory	Not profitable, net worth will be zero in 1997, heavy debt.
• Nefas Silk Sewing Thread Factory	Not profitable, negative net worth, negative liquidity.

D. Conclusions and Recommendations

In summary, the cotton/textile sector is losing money, has a negative net worth, is non-liquid and deeply in debt, and relies primarily on overdrafts from CBE to fund its current operations. The financial condition of the Ethiopian public cotton/textile sector is in crisis. Indeed, the situation was critical even at the time the current government inaugurated the new policies to move toward a market oriented, competitive sector.

It is worthwhile to remind the reader about the cause-and-effect discussion in Section I of this report; i.e., the sequence of cause and effect running from structure to conduct to performance. The financial indicators of an enterprise or a sector are an effect in the sense that losing weight is a result of an inadequate diet or that running a fever is a result of catching an infection.

Management looks to these financial indicators to determine the adequacy of their performance, but the real performance cannot be altered by changing accounting and financial conventions. Indeed, the usefulness of financial indicators is directly proportional to the integrity of these conventions. Neither can real performance be altered by infusing large amounts of money into the enterprises; the government, banks, and various donor organizations have done that before and performance has not improved. Even if all existing debts were magically wiped out, the sector would continue to lose money, unless the enterprises' conduct changes. The issue is not if the enterprises should be privatized, but whether conduct can be changed so the enterprises will perform satisfactorily. For this to happen, the structure within which the enterprises function will have to change.

Within the narrow context of financial practices, we recommended the following actions:

- Review the accounting entries that revalued the fixed assets; reverse them if necessary to reflect the actual net worth of the enterprises and restore the integrity of the financial records.

- Review all balance sheets and make appropriate adjustments for non-functioning equipment, discounted inventory, excess spare parts, and uncollectible accounts receivable.

- Revalue inventory levels and spare parts to reflect properly stock obsolescence; expense additional purchases of spare parts immediately instead of waiting until they are used. Use a target figure for spare parts inventory of 7-10 percent of original asset value.

- Call in or write off accounts receivable and limit them as much as possible; explore the feasibility of writing off the accounts payable. A sector-wide clearing house empowered by the government could assist in these actions.

- Increase the use of cost accounting to determine actual costs, break even points, and profitability of product lines; update the distribution of overhead costs.

- Require closer attention to ledgers and records—checking entry accuracy, correcting mathematical errors, and making sure the financial statements are consistent with supporting documents.

- Bring all annual audits up to date; complete them as soon as possible after the close of each fiscal year.

SECTION III

ORGANIZATION AND MANAGEMENT EVALUATION OF PUBLIC COTTON/TEXTILE SECTOR

SECTION III
ORGANIZATION AND MANAGEMENT EVALUATION OF PUBLIC COTTON/TEXTILE SECTOR

This section assesses the organization and management of the public cotton/textile sector and recommends changes to improve its performance. The focus is on the entire sector rather than on individual enterprises and is consistent with this study's terms of reference and the time and resource constraints imposed on it. Focusing on detailed and specific recommendations for individual enterprises would have required taking an adversarial stance against current management. This sort of assessment would rely primarily on information gathered by activities independent of management, rather than on information they provided, as did this study. In any case, a valid assessment of the sector does not require the redundant coverage of every enterprise because public textile sector enterprises in Ethiopia come from a common tradition and are subject to the same laws, regulations, and directives.

The team chose seven enterprises to represent those in the public cotton/textile sector (see Annex M for a list of meetings and plant visits.) Diverse views and opinions were also sought and obtained from knowledgeable persons outside the enterprises and the public sector (see Annex N for the questionnaire used in the interview process). The cooperation of these people in providing factual information and pertinent viewpoints was indispensable to this investigation.

Pertinent documents reviewed include:

- Public Enterprise Proclamation No. 25/1992
- Industrial Public Enterprises Establishment Council of Ministers Regulations of November 1992
- Labor Proclamation No. 42/1993
- Organization and staffing manuals of the sample enterprises
- Policies and procedures manuals of the departments in the sample enterprises
- A compilation for each enterprise on (1) the educational qualifications (2) years of relevant experience, and (3) special training of general managers, department heads, service unit heads, division heads, section heads, supervisors, and foremen
- A summary of grievance and dispute letters presented to the management of the sample enterprises during the last two years
- An abstract of labor cases forwarded to the appropriate judicial bodies by or against the sample enterprises in the last two years
- A list of employees who resigned on their own from the sample enterprises during the last two years, along with the reasons given for their resignations
- Turnover of board members and general managers in sample enterprises

- Collective agreements of the sample enterprises

- Government circulars sent during the last two years to the sample enterprises

- Annual management reports of the sample enterprises

- Past reports on training needs and programs of the sample enterprises

The remainder of this section analyzes the following:

- Organization and management structures
- Managerial capabilities
- Labor attitudes
- Working modalities and managerial practices
- Personnel and labor laws
- Training programs

The section concludes with a list of recommendations to improve organization and management in the public cotton/textile sector.

A. Organization and Management Structure

Although these issues are discussed in Section I of this report, this section will elaborate on them to fully develop the implications. The goals and strategies for the Ethiopian public sector must be understood in terms of Public Enterprise Proclamation No. 25/1992 and the Industrial Public Enterprises Establishment Council of Ministers Regulations of November 1992 (hereafter referred to as the Official Regulations).

Section I clearly showed that, based on Public Enterprise Proclamation No. 25/1992, public enterprises are intended to have "management autonomy" and be managed to make the enterprises "efficient, productive, and profitable." However, the Official Regulations, which established each enterprise as a separate legal entity, did not reinforce the thrust of the Public Enterprise Proclamation. The purpose of a manufacturing enterprise is to manufacture, sell, and engage in any trade that promotes the attainment of its purpose, but the Official Regulations ignore whether the cited activities are for the sake of making a profit or enhancing social welfare. Our assessment of the public cotton/textile enterprises' organization and management structures must occur within this unclear context.

A1. Authority Structures

As covered in Section I, the official chain of command for public sector enterprises runs from a supervising authority (i.e., PESA) to a management board to a general manager. Each entities' powers are enumerated in the Public Enterprises Proclamation 25/1992 and are described below.

Supervising Authority

PESA holds a position analogous to the shareholders of private enterprises; however, it exercises much more control than do shareholders. PESA is officially charged to "protect the ownership rights of the state" and is empowered to:

- Appoint and remove members of the board subject to Article 12 (2) of this Proclamation
- Appoint the chairman of the board from the members appointed by it
- Fix the allowances paid to the members of the board
- Appoint external auditors
- Cause the allocation of the initial capital of the enterprise
- Decide the increase or decrease of the capital of the enterprise in accordance with Article 21 or 22 of this Proclamation
- Cause the establishment of reserve funds or the allocation of funds by the Government so that the authorized capital of the enterprise shall be fully paid up within the period specified under Article 20 (2) of this Proclamation
- Determine, based on the proposals of the Board and following the relevant provisions of this Proclamation, the amount of state dividend to be paid to the Government from the net profits of each financial year
- Approve financial reports of the enterprise and external audit reports
- Approve the investment plan of the enterprise submitted to it by the Board
- Propose, where necessary, to the Council of Ministers the dissolution, amalgamation or division of an enterprise under its control, or the transfer of the enterprise or its management in any other manner
- Approve, in consultation with the Board, the annual and long-term corporate targets of the enterprise and follow up their fulfillment
- Without prejudice to the powers and duties given to the Board, perform other functions necessary for the protection of the ownership rights of the State

There can be little doubt that PESA is empowered to encroach upon management autonomy of public sector enterprises. While corporate shareholders do not become involved in the approval of investment plans and corporate targets, PESA is charged to do so. Neither do corporate shareholders exercise oversight on the implementation of annual and long-term targets; however, PESA does.

Even more striking is the power of PESA to ensure the adequacy of capital for public sector enterprises. In a political context, this amounts to the paradoxical situation of giving the authority responsible for seeing that the enterprises evolve toward self-sufficiency the

17

responsibility for preventing them from suffering the consequences of their failure to achieve self-sufficiency. The powerful position of controlling the enterprises' fate can easily become an untenable political dilemma.

While PESA clearly desires to avoid overt interference in management decisions, its involvement is felt in many ways. For example, by simply conducting routine workshops, seminars, and other meetings involving board members and/or general managers, a forum is created where officials and officers of PESA make statements and express opinions that the general managers take as directives.

Another way in which PESA constrains management decisions is by fixing the upper salary levels of the general managers. Even though the management board is given the power to set the salary level of the general manager under its jurisdiction, the upper limit fixed by PESA sets the salary of almost all public sector general managers at levels that are uncompetitive with emerging private enterprises. A board may well conclude that it cannot increase its general manager's salary to obtain the caliber of managers needed to lead the enterprise successfully.

Management Board

Ethiopia's current structural environment imposes significant disadvantages on management boards. For example:

- Boards of typical business corporations represent shareholders (owners), while the boards of public enterprises have no stake in the success of their business. There is no structural incentive for boards to make business success their first priority.

- In a capitalist system, it is not difficult to find capable, seasoned board members. In Ethiopia, however, few in the population have had this type of responsibility and authority.

Sub-article 2 of Article 12 of the Proclamation states that up to one-third of board members can be elected by the general assembly of the workers of the enterprise. This has resulted in worker representatives making up *exactly* one-third of the board in all enterprises of the sector. Board members selected this way are thus accused of (1) a biased, pro-labor attitude, (2) ignorance of the issues central to making the enterprise efficient, and (3) leaks in confidential information. Ethiopian management is also intimidated by the power of the board's worker representatives to influence the appointment and dismissal of top management.

Sub-article 4 of Article 12 calls for the appointment or election of board members on the basis of profession, experience, and competence. This has not been achieved in reality; many board members with inadequate experience and questionable competence have been appointed/elected. Further, it is widely believed that:

- Appointments have not succeeded in having at least one board member with the necessary competence in each functional area; e.g., finance/accounting, production/technical, marketing/procurement, etc.

- Most board members hold multiple positions and have competing responsibilities that preclude the allotment of time needed to study and become adequately prepared to discharge their responsibilities as board members.

- Except in rare cases, board members lack the strength of placement or connections necessary to give them confidence to take bold decisions, especially in policy and system changes. Neither do board members have job security, which discourages them from taking leadership roles.

The record indicates a high rate of turnover in the ranks of board members. In some enterprises, as many as ten board members have come and gone during the last three years. Whatever the major cause, an excessive turnover rate prevents continuous, knowledgeable service that board members need.

The powers and duties delegated to the board are to:

- Decide on policy issues other than those submitted to the supervising Authority pursuant to Article 11 of this Proclamation

- Appoint and dismiss the general manager of the enterprise and fix his salary and allowance

- Approve the employment, assignment, and dismissal of those officers of the enterprise accountable to the general manager, including their salaries and allowances

- Approve the internal regulations of the enterprise, its work program, and budget

- Approve the long-term loans and credits of the enterprise

- Approve the sale of fixed assets that may not affect the existence of the enterprise

- Ensure that proper books of accounts are kept for the enterprise

- Submit books of account to the auditors of the enterprise, and periodic reports on the state of the enterprise's activities and financial reports to the supervising authority

- Propose to the supervising authority the increase or decrease of the enterprise capital

The involvement of the board in the appointment, dismissal, and remuneration of officers that directly report to the general manager undermines the general manager's authority. Once the general manager has control over employment matters, he will be able to build the allegiance needed for cohesive teamwork to achieve the desired performance.

Based on the supervising authority's detailed directives, enterprise management are to present the following to the board:

- Quarterly and annual performance reports, along with plans of the subsequent periods and workers' views on performance, plans, problems, threats, and opportunities. These include:

    - Quarterly and annual financial statements
    - Quarterly and annual reports on production, productivity and capacity utilization
    - Quarterly reports on sales and marketing

- Monthly stock positions
- Monthly performance on collections and status of receivables and debts
- Minutes of the weekly meetings of the management committee
- Monthly reports on the status of accounting works

The receipt of this information invites the unwarranted interference of board members in matters that are legally reserved to the management of the enterprise. This has happened at some enterprises.

General Manager

Article 16 of the Public Enterprises Proclamation No. 29/1992 empowers the general manager to:

- Organize, direct, administer, and control the enterprise

- Represent the enterprise in all dealings with third parties and in legal proceedings brought by or against it

- Subject to the approval of the board, employ, assign, and dismiss the officers of the enterprise accountable to him and define their functions

- Employ, assign, and dismiss other employees of the enterprise in accordance with the internal regulations of the enterprise and the appropriate law, and determine their salaries

- Keep proper books of accounts of the enterprise, and open and operate bank accounts to the enterprise

- Enter into short-term loan contracts for the purpose of providing the working capital of the enterprise, borrow money on a long-term basis with the approval of the board, and for those purposes pledge or mortgage the movable or immovable property of the enterprise

- Prepare and submit to the board the internal regulations as well as the work program and budget of the enterprise, and implement same upon approval

- Sell fixed assets that may not affect the existence of the enterprise with the approval of the board

- Implement and cause the implementation of the decisions of the board

- Submit report to the board in such manner as it shall prescribe

- Delegate his powers to the officers and other employees of the enterprise to the extent deemed necessary

- Establish, and preside over the meetings of, a management committee that shall advise on the operations of the enterprise and that may discuss on the progress, plans, and decisions of the enterprise

- Perform other duties assigned to him by the board

While it may be argued that the law gives management autonomy, the unavoidable conclusion is that this sector has not achieved autonomy. The barriers to autonomous management of the public cotton/textile enterprises have already been discussed. Nevertheless, further elaboration of structural and environmental impediments may be helpful. They include:

Lack of management expertise. Inadequate management training and a lack of open market experience means that managerial capability at the enterprises is still in its infancy. In most cases, managers reveal that they are not ready for autonomy; if they are, they move out of the public sector, seeking independent responsibilities elsewhere.

Insecurity of executive officers. Perceived arbitrariness of appointments and dismissals, a lack of mutual trust between managers and board members, and the above mentioned lack of management expertise foster a culture of insecurity among the senior executives of the enterprises. Without security, managers cease to take responsibility and exercise their authority. A symptom of this is that general managers try to involve the board in operational matters. Another is that the enterprise is susceptible to tyranny by labor unions. Yet another is their unwillingness to delegate authority and decentralize power, which must occur if autonomy is to be possible.

Systemic bias about labor. Whenever a dispute develops between management and labor, irrespective of the merits of the case, labor is favored by some politicians, officials, and/or administrators. This provides an incentive to laborers (both organized and unorganized) to be militant and unruly, even to the point of lawlessness. Labor interference is perhaps the most important factor that prevents management autonomy.

Interference by PESA and by Boards. The potential arbitrary exercise of power by the supervisory authority or management boards suppresses the authority and autonomy of management. Until this power is structurally constrained, management initiative will be discouraged.

Irresponsibility by the media. Public and private media substantially hinder the emergence of management autonomy by disseminating unverified accusations and insults against managers and other executive officers, and by portraying executives as dishonest and corrupt, actions that provoke their policing and exposure by workers.

Institutional sabotage. Some key institutions do not recognize the legal changes that have been made to foster autonomous enterprise management. Thus, some courts seem to think that the general manager cannot reject the promotion committee's recommendation. Also, some bank functionaries still refuse to open letters of credit based on the general manager's authority.

A2. Organizational Structures

As a result of recent studies undertaken in the public cotton/textile sector by each enterprise, using either external consultants or internal expertise, the enterprises adopted similar organizational structures. These structures have distinct organizational units for such activities as production and maintenance (in agricultural and technical areas in the case of farms), marketing, materials management, accounting and finance, personnel administration, internal auditing, planning and programming, legal advocacy and advisory functions, etc. Some manufacturing enterprises used the product-line approach of departmentalization along with the functional approach of sectionalization.

Typical organizational charts are presented in Exhibits III-1 through III-3, representing textile factories, garment factories and cotton farms, respectively. Although these organizational structures seem reasonable, they are too bureaucratic and supply-driven. To determine the needs and efficiency of the enterprise, the following questions should be answered:

- Does an O&M or management service need to exist or be established? Should this area be the priority of the general manager, who can draw on the expertise and advice of knowledgeable board members, rather than a separate division within the enterprise?

- Does the number and nature of legal cases to be handled justify the creation or maintenance of a legal service?

- Has the planning and programming service outlived its usefulness since the passing of the socialist era? The general manager should provide leadership in this area, using departments, such as the production and technical department, the marketing department, etc., as he sees fit.

- Would the unit responsible for design and product development be more effective under the general manager or the head of the commercial department (rather than the head of the production department)? This would seem necessary to ensure the production of goods whose type and quality the customer desires.

- Is it feasible to delete the position of deputy general manager?

- Is it an unnecessary expense to have a department for stores administration?

- Would it be more appropriate to place the market research and promotion activity directly under the head of the commercial department rather than the general manager?

As these enterprises emerge from a centralized bureaucracy, changes in organizational structures should be made to respond more effectively to market signals, rather than remain hostage to the internal, vested interests of the organization. Some power centers may need to be deleted to prevent interference with the goals established by the board and targeted by the general manager. Subject to this market-oriented focus, refinements should enable more timely, efficient responses to the following objectives:

- Achieve stated objectives by providing a framework for a clear-cut division of labor that permits specialization along the lines of the basic or organic functions of the enterprise

- Engender better performance control through, among other things, the constitution of cost and responsibility centers.

- Exploit the benefits to be derived from the use of line and staff relationships.

- Permit the delegation and decentralization of authority and responsibility based on a well-established line of authority and unity of command and efficient lines of communication.

Exhibit III-1. Textile Factory Organization

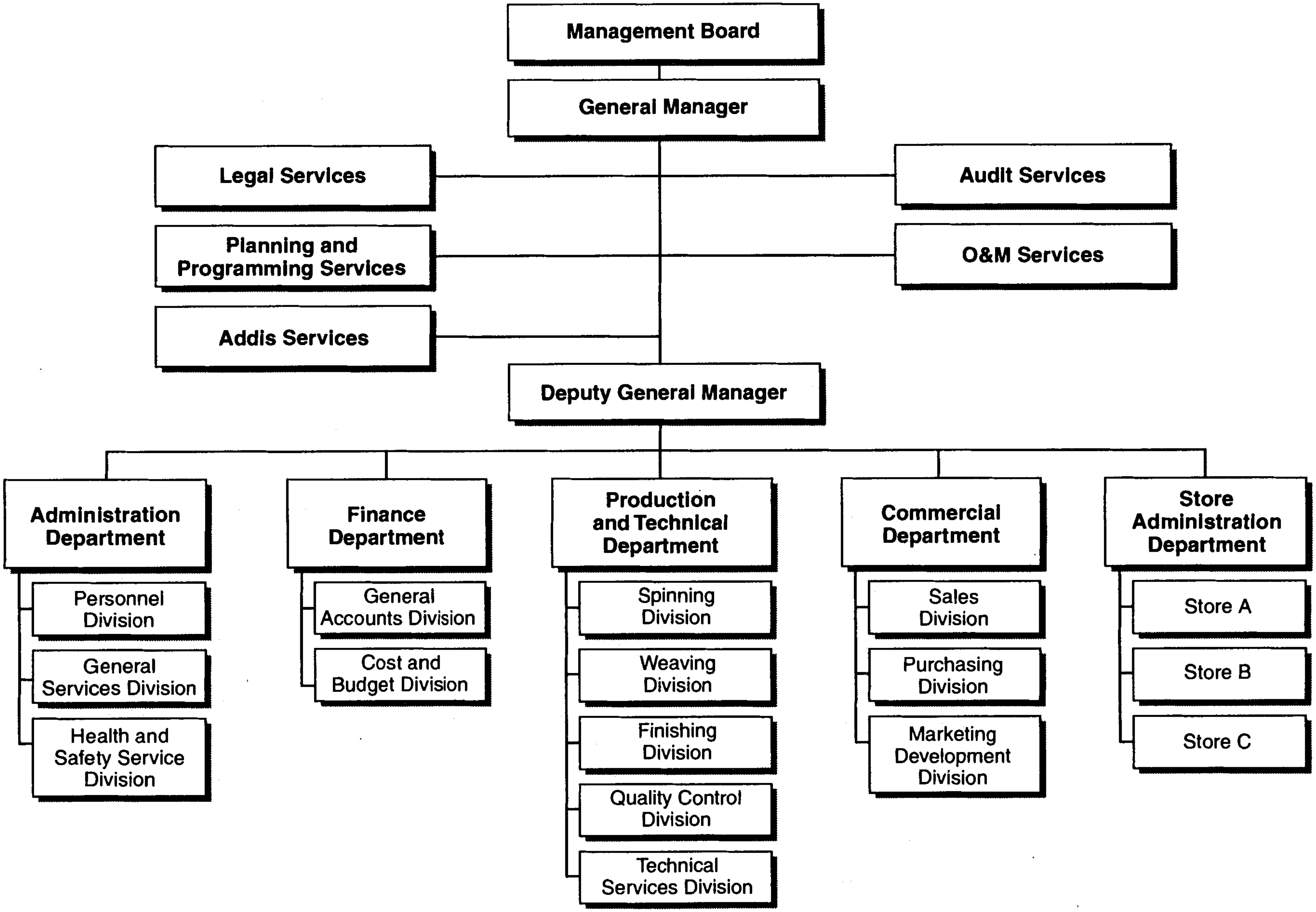


Exhibit III-2. Garment Factory Organization

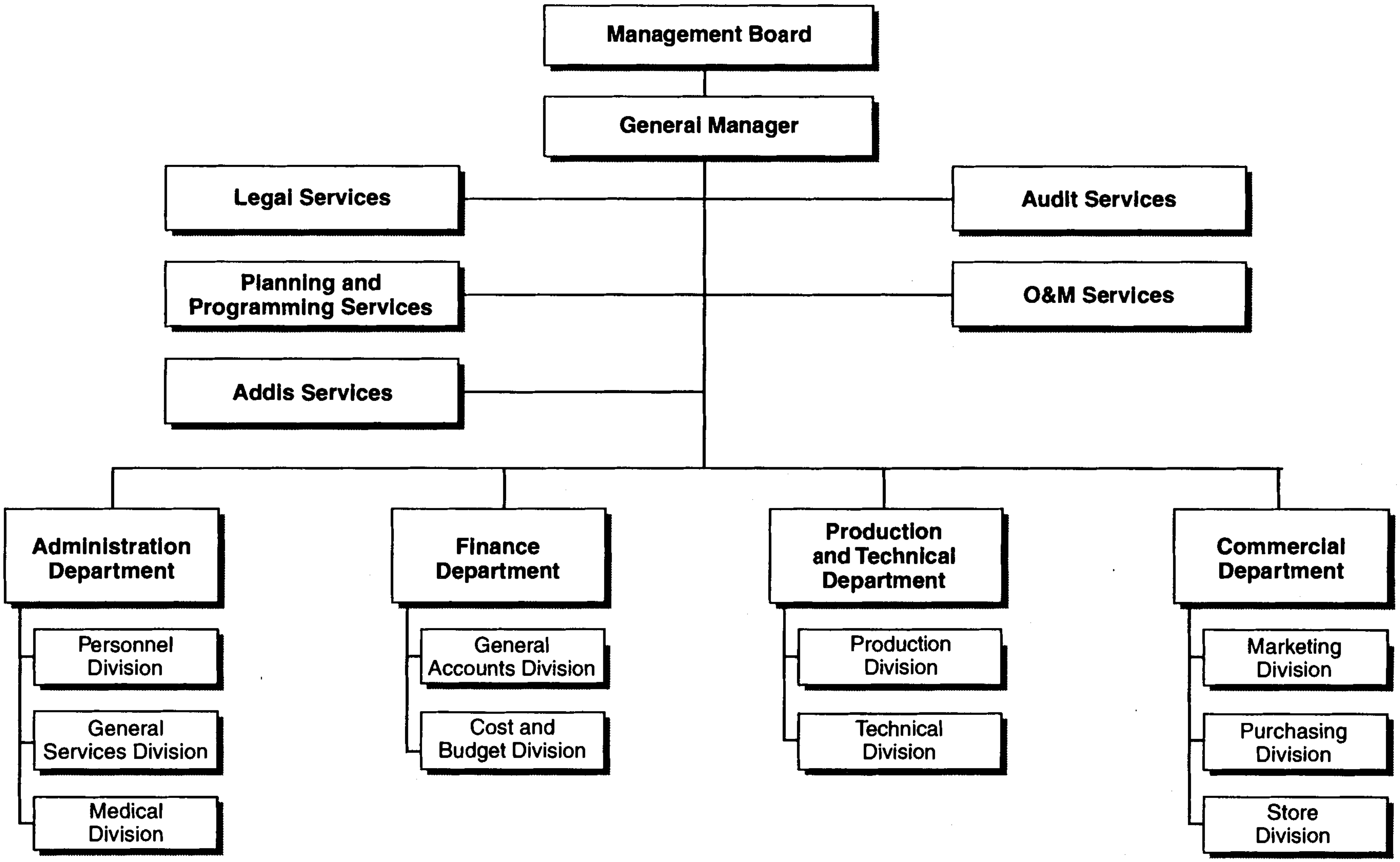
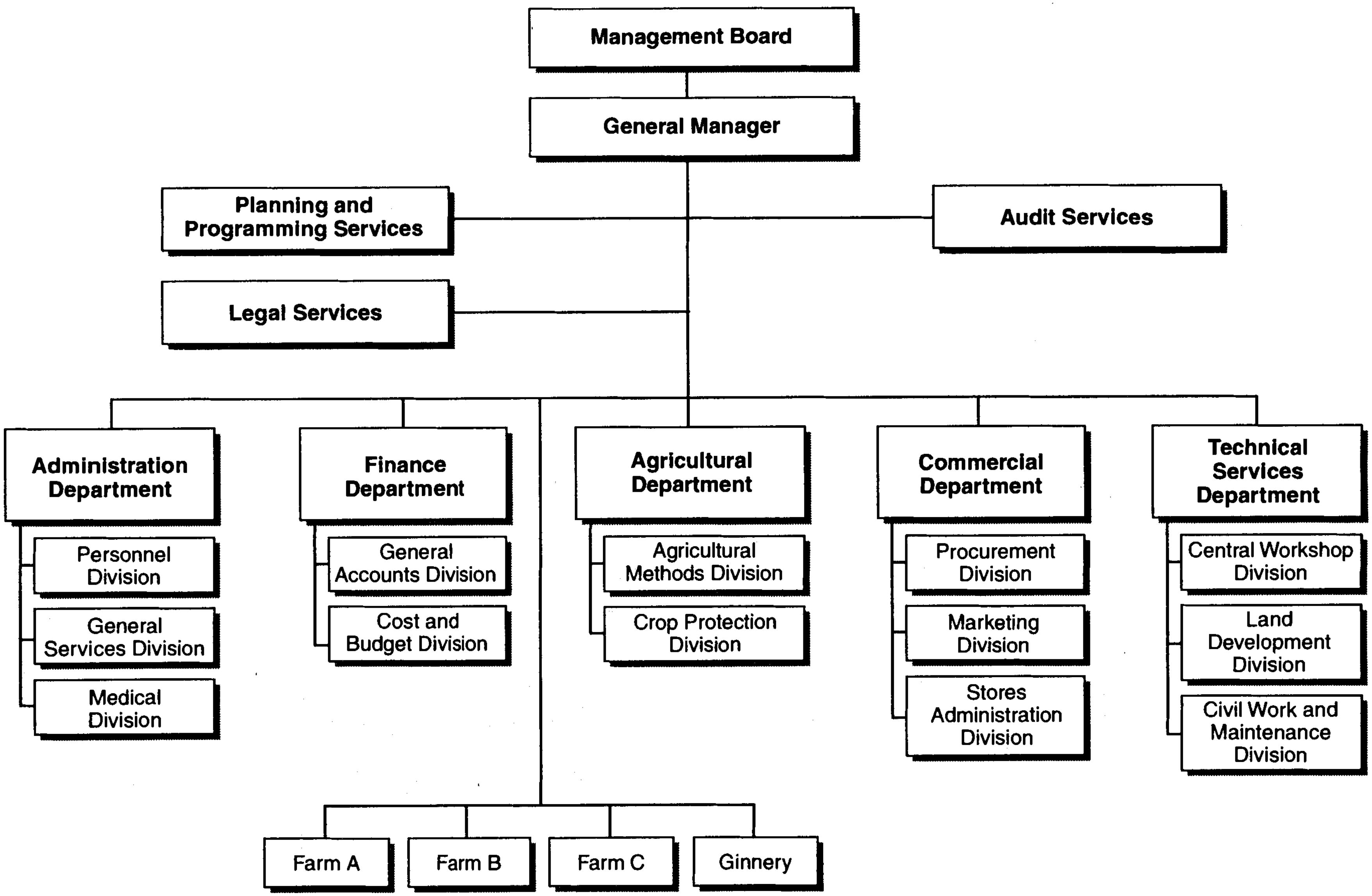


Exhibit III-3. Cotton Farm Organization



When using the functional form of departmentalization, enterprise objectives can be undermined by the dogged pursuance of narrow departmental objectives. This tendency can be overcome with two techniques:

- **Effective coordination and control mechanisms** can solve coordination problems which loom large in some enterprises. Solving them will require a personal, priority involvement by top management.

- **Development of team spirit** is a leadership challenge, requiring the use of multiple approaches that are structural (appropriate remuneration and incentive systems), educational (routine sensitization meetings), etc. Employees must come to understand that their success is tied to the success of the enterprise.

The organizational structures in the public cotton/textile sector provide for three levels of managerial hierarchies below the general manager. The department level is at the top, the division level in the middle, and the section level at the bottom. (In some cases, they are called divisions, sections, and units.) In the production area, supervisory personnel and foremen constitute the fourth and lowest managerial hierarchy. This hierarchy allows timely information flow and decision making. Therefore, repeated changes are likely to be counter-productive, unless the changes made are clearly needed to make the forms of the organization better serve the functions performed.

Unfortunately, constant reorganization of staff is common among the public cotton/textile sector enterprises. Furthermore, the impetus behind them seldom allows form to follow function; it is aimed instead at establishing revised benchmarks for bureaucratic salary scales. This may have seemed logical when funds could be allocated by government order in response to the dictates of a bureaucratic reshuffling; however, reorganization has no impact under the current structure of the economy. Unless reorganization actually results in improved performance of an enterprise, it is a costly and useless exercise.

Staffing Plans

To execute an effective staffing plan, managers need to know the appropriate standards for each job. Without such standards, even the number of employees needed for each job is an arbitrary determination. The result in almost all quasi-government bureaucracies is the employment of too many workers at very low rates of pay. In all cases, numbers of production workers are far above the international standards for textile enterprises in developing countries. Excess employment occurs most often in the secretarial, clerical, and administrative areas and persists because of the dictates of past practices and approaches, not because of the enterprises' current needs.

One reason for inefficient staff performance is the public sector enterprises' unwritten rule that two years of work experience are the equivalent of one year of formal education. This allows high school dropouts with many years of work experience to get jobs that require the expertise of a college graduate. This practice subverts the imperative to select the most qualified people. More strategically, it becomes impossible to inject new blood into the enterprise which is necessary for the business to survive beyond its current contingent of employees. No reorganization can overcome constraints such as this. Such constraints must therefore be removed.

Job Descriptions

A complete set of job descriptions currently exists in almost every public cotton/textile sector enterprise. Many enterprises have issued job descriptions to all employees, some have issued them only to a limited number of high level personnel, and a few have not issued job descriptions to any employees. The latter are reluctant to do so because they fear that issuing job descriptions will engender job inflexibility and labor disputes if and when management finds it necessary to enlarge jobs or assign new functions, even temporary ones, to employees.

This reluctance testifies to the lack of control management feels over employees. But the imperative to establish clear communication between management and labor requires that clear, concise job descriptions be provided to everyone. In adversarial management-labor cultures, job descriptions, policy manuals, and collective agreements commonly state that management reserves the right to make reasonable job enlargements and legitimate departures from job descriptions.

Salary Scales

Based on acceptable job evaluation criteria, the jobs of most enterprises have been graded and the salary ranges associated with each grade have been developed. In one case, however, only the starting salaries of each grade are given. Some salary scales are still under consideration by relevant boards, some are in the process of being implemented, and some are already implemented.

In all cases, salary levels are quite low because PESA stipulates a low ceiling for general managers' salaries. The financial position of the enterprises also precludes an increase in pay levels without a reduction in the number of employees. As a result, enterprises lose the more qualified employees and find it difficult to attract qualified ones. Resignations in the sample enterprises during the last two years (regardless of reason) vary from as low as 26 to as high as 37. Since these resignations were from the ranks of the most skilled employees, the loss is greater than the figures imply.

B. Managerial Capabilities

Managerial capability is not only a function of personal qualifications and attributes. It is also determined by factors in the internal and external environments, which must also be considered.

Within the public cotton/textile sector, educational levels of general managers are adequate. In the sample enterprises, for example, all have a minimum of a bachelor's degree. However, their specialization is not in management; neither have they augmented their training with short-term business management courses. While our discussions with top executive officers reveal that they possess a working knowledge of business management, they also indicate a failure to bring this knowledge to bear on their daily decisions and actions due to structural impediments and a lack of relevant experience. Even though all general managers have years of service, few of them have amassed much managerial experience relevant to a market-oriented enterprise.

The educational levels of personnel presently heading substantive departments (production, commerce, finance, and administration) are somewhat uneven. For the seven sample enterprises, almost half of the personnel do not hold a college degree (see Exhibit III-4). Of course, the experience of these personnel may qualify them for their work; nevertheless, the executive officers recognize the educational deficiency of the middle managers. Communication from them indicates that they would replace at least one-third of middle management personnel if they had the authority to do so.

Exhibit III-4. Department Heads With and Without College Degrees

Enterprise	Number With Degrees	Number Without Degrees
Addis Garment Factory	2	2
Adei Abeba Yarn Factory	2	2
Akaki Textile Factory	1	1[1]
Awasa Textile Factory	3	1
Dire Dawa Textile Factory	2	2
Nazareth Garment Factory	3	1
Middle Awash Ag. Dev. Enterprise	1	3

[1]Two positions are vacant.

These management constraints do not fully explain the prevailing lack of confidence and motivation. Factors which contribute to this include:

- Lower level employees are allowed to bully, harass, or even expel from office top level personnel, with the exception of the Middle Awash enterprise.
- High level personnel do not have tenure security and lack confidence that their Boards will support them, with the exception of the Middle Awash enterprise.
- Informal powers exercised by party members, union leaders, etc., are superior to the formal powers allotted to executive officers.
- Appraisals of executive performance are based on routine, bureaucratic decisions about process rather than success in the marketplace; unprofessional, socialistic modalities (such as "workers' assessment forums") are always used.
- Remunerations are low, and fringe benefits and bonuses inadequate, relative to the cost of living and offers made by emerging organizations in the private sector.
- The public media persistently assaults the honesty and integrity of top executives.

In private sector corporations, general managers are assessed against their achievement of explicit, objective measures of performance (e.g., profit, market share, stock values, etc.), measures on which they and the board of directors agree. To achieve these objective measures, they realize they must successfully involve people throughout the enterprise, but they also realize their performance is not assessed by the subjective judgement of people throughout the enterprise. Democracy is a form of government, not a method for managing a business enterprise.

The government-owned enterprises are run in a quasi-political fashion, resulting in the board, labor, and not infrequently the media scrutinizing even minor decisions. Negative consequences are many:

- Job survival is based on politics, rather than economic performance. Political criteria for success are ambiguous and shifting, rather than clear-cut and stable.

- Even monetary rewards are not connected to economic performance. The money earned by top managers is circumscribed by salaries that are fixed at low levels, along with inadequate fringe benefits and bonuses, relative to the cost of living and offers made by the emerging organizations in the private sector.

- The strategic need for a spirit of collaboration and teamwork among executive officers is subverted. Some officers have openly opposed their peers to align themselves with the labor unions.

This structural environment cannot foster bold and effective decision makers.

C. Labor Attitudes

The workers' attitude is to exploit every means of maximizing guaranteed material benefits and job security. The inherent incompatibility of maximizing employment and pay rates is not confronted within the sociopolitical context of labor unions; therefore, the practical result is to keep pay rates at very low levels. The workforce does not yet have a professional attitude. Most workers display the attitudes of the peasant class from which they are drawn and with whom they interact daily. Many consider industrial work an adjunct to other occupations such as part-time farming or trading. They do not see a strategic connection between their future well-being and the prosperity of the enterprise, but view enterprises as social welfare organizations to be exploited politically.

As already mentioned, the result is a very destructive relationship between labor and management. Executives are randomly accused, harassed, and, at times, verbally and physically abused by workers. Even though mechanisms for conflict resolutions are laid down in legislation and collective agreements, they are routinely supplanted by political or, in some cases, lawless force.

The number of active court cases indicates the nature of this unhealthy relationship. In one enterprise, current court cases involve as many as 263 employees. Disputes involve pay, leaves, fringe benefits, promotions, transfers, disciplinary measures, pilferage, new placements from enterprise reorganizations, rejection of newly appointed heads of organizational units, etc.

Finally, the adversarial nature of management-labor relationships is fostered by the number of formal and informal mechanisms workers have to press their concerns and grievances, such as meetings, ad hoc interest groups, trade unions, suggestion boxes, the media, etc. These do not allow for a reasoned discussion of issues and a meaningful response by management.

D. Working Modalities and Managerial Practices

Numerous systems, practices, methods and modus operandi are prevalent in the public cotton/textile sector enterprises. This section analyzes those that must be developed into more effective vehicles for carrying public sector enterprises forward.

D1. Collective Leadership

The system operates on the basis of collective accountability, responsibility, and authority. Without individual responsibility, however, the situation will continue to exhibit the following problems:

- Many managerial decisions are made or heavily influenced by committees. For example, personnel recruitment and promotions are processed through committees rather than through the heads of departments.

- Management executives, who should bear responsibility for different functions in the enterprises, do not have the authority to determine the nature and quality of their staff. Thus, a recently issued manual regulating the management staff stipulates that candidates eligible for promotions will be evaluated by a special committee designated by the general manager. Political processes thus often usurp managerial processes.

- Procurement of fixed assets, raw materials, and spare parts are handled through committees.

- Management committees weekly meet and take decisions on all major matters, depriving (or relieving) general managers of the responsibility of their positions.

The argument is that most committees are advisory in nature. Although this is officially the case, in reality it is incorrect. Compliance with committee recommendations is not discretionary; no manager believes that he can, for example, overrule recruitment, promotion, training, and purchasing committees. Any general manager who dares to override committee recommendations expects an investigation prompted by labor, the board, the supervising authority, the security force, the attorney general's office, the auditor general's office, and/or the media.

Appropriate uses of committees are to bring together group knowledge, experience, and judgement; motivate people by involving them in solutions to problems; ensure coordination; and foster communication. It must be decided if these benefits warrant their large investment in time and the compromises are appropriate for the decisions to be made. Use of committees should not be allowed to stifle managerial initiatives, dilute executive authority, imply mistrust of executives, or provide a control mechanism.

A corollary of the problem of management by committee is limited delegation of authority down the ranks of the enterprise. The right balance of control versus delegation is the secret of achieving timely and informed decisions, and realizing continuous staff development. The persistent reshuffling of officers and constant interference from outside management ranks makes appropriate delegation more difficult.

D2. Bureaucratic Documentation

Meaningless documentation is disconcertingly relied on as a substitute for determining the reality of a situation. For example, the collection of three proforma invoices is required to select the most appropriate supplier, yet everyone knows that all three invoices can be obtained from a single supplier.

Official receipts are uncritically accepted from other organizations as authentic evidence of payments. Such receipts have validity in business environments that use the amounts indicated on them as the basis for determining income taxes, but this is not the case in Ethiopia, where many organizations do not keep meaningful accounting records and taxes are based on unverified estimates. Such organizations issue receipts only when requested and, at times, for any sum that is mutually agreed on.

When an enterprise exists on the money it makes from production, the reality of such documentation is foremost in the minds of management. The fact that management is content with meaningless documentation indicates that it does not believe these financial realities are critical to the enterprise's survival and success.

D3. Bureaucratic Communication

Reports are filled with unnecessary details, while central issues are obscured. They also contain inaccurate or meaningless data which is not provided on a timely basis. As a result, they are difficult to assimilate and fail to direct readers toward prompt solutions.

Feedback to reports is inadequate and untimely. Even departments that routinely pester lower level organs for the timely submission of reports are seen as procrastinators when it is their turn to provide feedback. Without meaningful reports on timely feedback, productive communication is sabotaged, and reporting becomes a waste of time and money.

Another manifestation of unproductive bureaucratic communication is constant tampering with policy and procedure manuals. This is frequently done in a futile attempt to solve problems rooted in fundamental structural realities, problems that can only be addressed by taking hard decisions. For example, repeated studies of salary scales cannot do away with the demand for better pay or change the ability of the factory to pay; revisions of employees' grade levels cannot alter the fundamental realities of the labor force; and modifications of cost accounting systems cannot remove financial dilemmas and rectify inaccurate data.

D4. Fixed Labor Costs

The size of the labor force of a business operating in an open-market economy corresponds to technological imperatives and the demand for its products. This is not the case in the public cotton/textile sector, where excess labor is apparent everywhere. This situation inflates the enterprises' total labor bill and decreases the productivity of all workers through its negative social dynamics.

D5. Bureaucratic Internal Promotion

The management of a private enterprise focuses on performance when determining which employees will be promoted; however, current systems in Ethiopia require that primary weight be given to educational levels and years of service. A doctorate does not guarantee energy and creativity nor does long employment guarantee superior knowledge and initiative. Such yardsticks must be relied on when evaluating newcomers; for current employees, assessment should be based on performance.

Performance evaluations are more difficult and time-consuming for top management than are rigid, bureaucratic schemes, but top management should use them because optimizing human resources is their responsibility. While the process should be made objectively and transparently, it must not become hostage to the labor unions' criteria of fairness. Top management can minimize resentment about the selection process if it involves employees in a discussion about their evaluations.

D6. Collective Agreements

Public sector enterprises operate within collective agreements negotiated and signed during the socialist era when labor was officially upheld. Even the few new agreements recently negotiated and signed do not alleviate the one-sided nature of past agreements. PESA has recently issued detailed directives intended to balance negotiations for new collective agreements. The fruits of these directives are yet to be seen.

E. Personnel and Labor Laws

The major legislation governing worker-employee relations in Ethiopia is Labor Proclamation No. 42/1993, which covers employment contracts; obligations of the employer and employee; conditions and procedures of contract terminations; determination of wages and modes of payment; hours of work, rest days, holidays, overtime, and leave; occupational, safety, health and working environment considerations; formation and functions of trade union and employer associations; and collective agreements and labor disputes.

During interviews, management personnel raised concerns about six features of this law. They are as follows:

- Sub-article 2 of Article 54 states, "A worker shall be entitled to his wage if he was ready to work but, because of interruptions in supply of tools and raw materials or for reasons not attributable to him, was not able to work." These causes of interruptions are also beyond the control of enterprise management; therefore, making the enterprise liable for them is quite arbitrary and costly.

- Sub-article 3 of Article 88 states, "A woman worker shall be granted a period of 30 consecutive days of leave with pay preceding the presumed date of her confinement and a period of 60 consecutive days with pay of leave after her confinement." The large numbers of female workers at textile and garment factories assures that this requirement imposes a persistent, large cost that cannot be recouped.

- As per Sub-article 2 of Article 108, salaries and wages should be paid for as much as one year in the event of a temporary disablement occasioned by employment injury. The amounts to be made should not be less than 75 percent of one's wages during the first six months and not less than 50 percent during the subsequent six months. Also, sick leave arising from normal illness are mandated with full pay for up to one month, with 50 percent pay for two additional months, and leave without pay for three more months.

Indications are that the unrecoverable costs entailed by these requirements are quite high in some enterprises.

- The legislation enables many and varied types of paid leaves: annual leave, marriage leave, mourning leave, family-event leave, union leave, court-appearance leave, leave for exercising one's civil rights, educational and training leave, sick leave, maternity leave, etc. The costs associated with these leaves are also very substantial.

- Article 129 establishes the encroachment of labor into management authority. It states that collective agreements may permit the participation of labor "in matters regarding promotion, wages, transfer, reduction, and discipline."

- The courts' interpretation of this law has made employee termination or dismissal nearly impossible. The feeling is widespread that many employees dismissed for legitimate reasons are arbitrarily reinstated by the courts.

Proclamation No. 42/1993 does not apply to "persons holding managerial posts who are directly engaged in major managerial functions." This includes the general manager and the executive officers that report directly to him; it may also include lesser officers who report to executive officers below the general manager. Policies, rules, and regulations that govern their working arrangements are currently prepared by the management of each enterprise for approval by the enterprise's board.

F. Training Programs

Training in general and management training in particular are treated differently in each enterprise. One enterprise, for example, managed to provide different training programs to approximately 392 employees over a two-year period. In others, training is ignored. In some enterprises, training programs are based on needs assessments; in others, training is determined almost exclusively by invitations from training institutions. Given the acknowledged deficiency in management capability in the public cotton/textile sector, priority should be given to effective executive development programs.

G. Conclusions and Recommendations

Structural and environmental factors impose behavioral, managerial, and performance constraints on the public cotton/textile enterprises that are inconsistent with their emergence from a centrally controlled, subsidized environment. To alleviate these inconsistencies:

- Make the regulations issued by the government more consistent with the intentions expressed in the Public Enterprise Proclamation.

- Alter PESA's relationship to public sector enterprises by putting it into a position more like that of corporation shareholders, thereby limiting its involvement in the management and operation of the enterprises.

- Select capable management boards to focus on the business success of public sector enterprises. Take steps to lessen the boards' grip on management prerogatives.

- Focus on the critical need for remedying the lack of management expertise, in preparation for empowering top management to control the enterprises.

- Focus on educating key institutions such as the courts and banks about the current status and modus operandi of public sector enterprises.

- Encourage the elimination of entities from current organizational structures that are not cost effective. Seek managerial arrangements that foster effective coordination and control mechanisms and develop a team spirit.

- Avoid tampering with organizational structures unless the objective is to make form change function.

- Focus on establishing and implementing appropriate standards for jobs, including the number of jobs to fill. Develop and disseminate clear, concise job descriptions.

- Rationalize salary levels to be paid to employees with those of the competition so that the most productive ones can be kept.

- Recognize and address the conditions that undermine top management positions in public sector enterprises. Connect their remuneration to their success in the economic arena.

- Take steps to convince laborers that their continued employment depends primarily on the economic success of the enterprises, rather than on the exercise of opportunistic power.

- Take steps to de-emphasize the management by committee approach and emphasize the importance of individual initiative and performance.

- Emphasize the importance of preparing concise, pertinent reports that clearly indicate the reality of the business situation, rather than accepting detailed bureaucratic documentation.

- Insist on proper communication that improves productivity, quality, and shared views and objectives.

- Base promotions from within the enterprises on performance and demonstrated potential; prohibit bureaucratic interference with the promotion process.

- Hasten to remove the socialistic agreements that bind management and labor, and revise policy and procedures manuals as soon as possible.

- Rationalize the fringe benefits to workers contained in Labor Proclamation No. 42/1993.

- Seek out and provide effective training programs to motivate workers and managers.

SECTION IV

ECONOMIC AND MARKETING EVALUATION

SECTION IV
ECONOMIC AND MARKETING EVALUATION

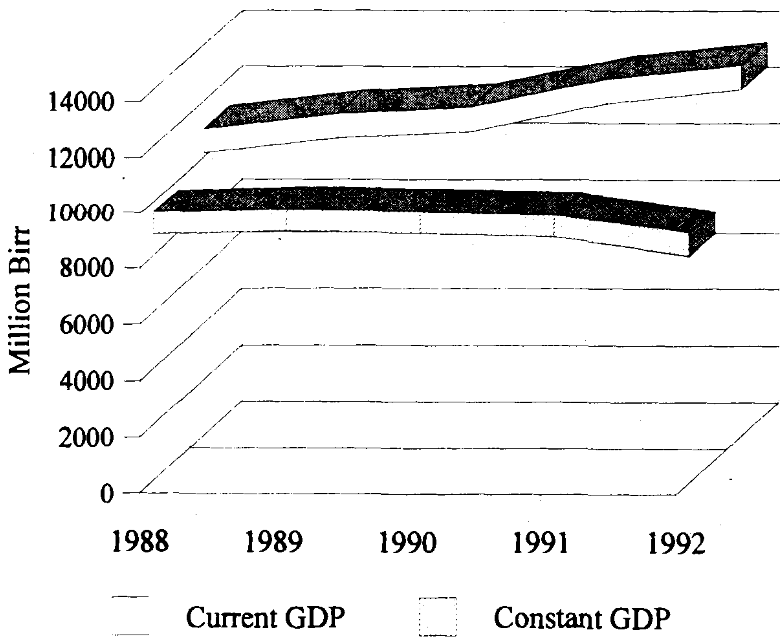
The Ethiopian economy has undergone substantial changes in the past five years. The Ethiopian economy has been, and still is, in the midst of a great transition. The government has clearly been concerned that the pace of change not occur too fast for the country's institutions and people. The challenge is to maintain an orderly transition, but to avoid making it last so long that damaging distortions are perpetuated and new avenues of economic development are foregone.

This section examines the status and the potential of the Ethiopian economy and the public cotton textile sector, emphasizing the requirements for exploiting opportunities in domestic and export markets.

A. State of the Ethiopian Economy

Regretfully, the lack of macroeconomic data make an authoritative assessment of the current status of the Ethiopian economy impossible. Available data indicate that the general economy has not improved significantly, and may have worsened somewhat, since the global economic recession in 1990-1991. Exhibit IV-1 shows that the Ethiopian Gross Domestic Product (GDP), when expressed in constant birr, has fallen each year from 1988 through 1992 (the last year for which published data are available).

Exhibit IV-1. GDP Growth Rates in Ethiopia



Such erosion in real income is particularly distressing to the textile and garment sectors. It is well known that income and population growth are the critical determinants of growth in fiber and textile consumption. No doubt policies that foster growth in total and per capita income are essential to the long-term survival of the domestic textile industry. Without such growth, industrial planning and targeted assistance will be futile.

A1. Sources of Income

The consumer side of economic activity in Ethiopia has been deregulated significantly by the current government. Although import tariffs remain at generally high levels, many goods that had been prohibited from entering Ethiopia are now available. On the production/supply side of domestic economic activity, however, state-owned enterprises still dominate.

Despite government policies and programs over the last 40 years aimed at expanding the share of national income held by industrial activities, Ethiopia's economy remains heavily agricultural. The agricultural sector accounted for nearly half of all economic activity in 1992, the most recent official data available (Exhibit IV-2). This was up from about 43 percent in 1988 and 1989; furthermore, it is likely that agriculture's share has continued to increase since 1992. However, published statistics for the years prior to relaxing price controls in 1991 may have understated agriculture's true market share.

Exhibit IV-2. Contributions of Selected Economic Sectors to Ethiopia's GDP (Million Real Birr[1])

	1988	1989	1990	1991	1992
Total GDP	9,199.1	9,347.7	9,261.4	9,153.6	8,479.3
Amount due to:					
Agriculture	3,923.7	4,011.4	4,020.5	4,342.9	4,169.2
Manufacturing	757.9	770.7	736.5	539.4	503.4
Cottage industry	357.0	365.9	357.0	349.9	360.4
Percent Due to:					
Agriculture	42.7	42.9	43.4	47.4	49.2
Manufacturing	8.2	8.2	8.0	5.9	5.9
Cottage industry	3.9	3.9	3.9	3.8	4.3

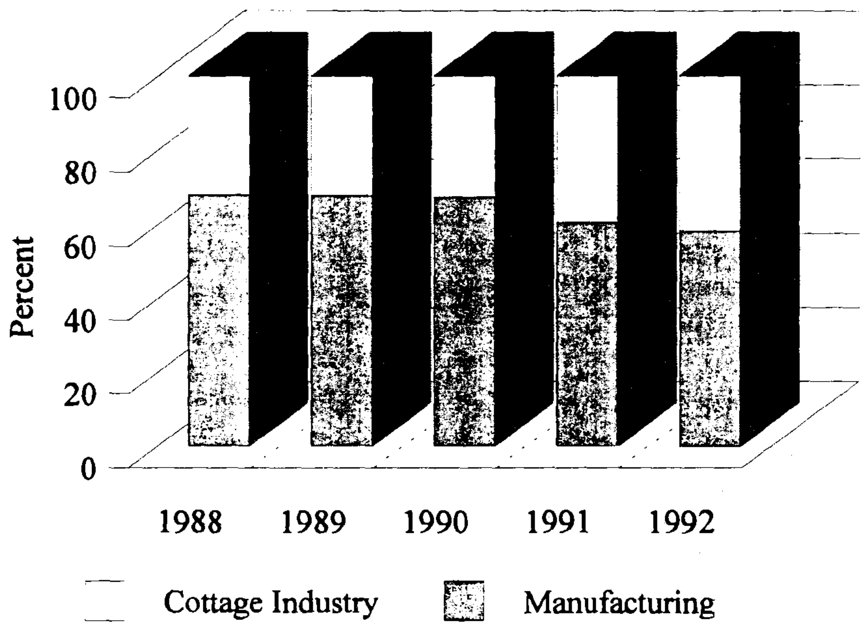
Source: Ethiopia Statistical Abstract, 1992.
[1]Deflated using 1980 = 100.

The share of GDP held by manufacturing (which includes textile manufacturing) fell from over 8 percent to under 6 percent (Exhibit IV-2). Furthermore, all industrial activity (which includes manufacturing, mining, construction, utilities, handicrafts, and small industries) accounted for only about 14 percent of GDP in 1992.

While the manufacturing sector continues to erode, handicraft manufacturers and small scale industry, which is comprised mostly of private enterprises, has recorded increases in relative and absolute terms. This cottage industry sector has quietly grown from 3.9 percent of GDP in 1988 to 4.2 percent in 1992 (Exhibit IV-2). Taking the gross value added by manufacturing and cottage industry combined, cottage industry has increased from 32 percent of the total in 1988 to 42 percent in 1992 (Exhibit IV-3).

Exhibit IV-3. Shares of Gross Value Added

Manufacturing and Cottage Industry Combined



A2. Distribution of Spending

The Ethiopian economy is heavy in national account expenditures. The most recent statistics indicate that personal consumption expenditures accounted for almost 85 percent of all economic activity (Exhibit IV-4). By comparison, in most industrialized countries such as the United States and those in the European Union, personal consumption averages about two-thirds of GDP.

Exhibit IV-4. Distribution of National Spending in Ethiopia, 1992

Category	Amount (Mil. Br)	Share (%)
Personal consumption	11,738.9	84.7
Direct government spending	2,164.9	15.6
Gross fixed capital formation	1,241.7	9.0
Net exports	-1,286.6	-9.3
Exports	936.8	6.8
Imports	2,223.4	16.0

Direct government spending accounted for the second largest share of total expenditures with almost 16 percent (Exhibit IV-4). Capital investment accounted for only 9 percent of all spending. Ethiopia had a trade deficit of almost Br 1.3 million.

Clearly, Ethiopia needs to increase the level of investment in the country. This must be done either by attracting foreign investment or by increasing domestic savings rates. Past government efforts to control consumption and savings proved futile, as capital spending as a percent of GDP contracted constantly from 1988 to 1992. The savings rate of any nation is directly tied to growth of per capita personal income; therefore, improved structural efficiencies that enable higher incomes would alleviate the problem of inadequate domestic investment.

A3. Population Distribution

The dominance of agriculture in the Ethiopian economy is reflected in the fact that about 85 percent of the population live in rural areas. Addis Ababa is the only large city; it has approximately 2.7 million people, or about 5 percent of the total population and about 28 percent of the urban population. If the population of Addis Ababa is subtracted from the total, rural dwellers account for about 90 percent of the remaining population.

Despite its rural nature, the population is geographically concentrated in the center of the country. Of the country's 14 provinces, only two, Shewa and Hararage, account for nearly one-third of the total population of the country. By adding two more provinces, Sidamo to the south and Gojjam to the north, over half of the nation's population is captured. In none of these four provinces does the urban population account for more than 13 percent of the people.

The distribution of the population presents a dichotomy in the demand for textiles. The urban consumer has largely shifted to ready-made imported clothing, due in part to the superior styles, variety, and competitive prices of these textiles. The large rural population has become a mainstay in the demand for traditional fabrics such as *abujedid* and *asnatkech*. But these fabrics have extremely low margins and are made with increasing disregard to quality. A large position of imported apparel textiles offer a combination of easy-care durability and color fastness, often through the use of fibers such as polyester and nylon, which withstand the harsh environment of rural areas. These textiles increasingly draw rural consumers away from domestically produced textiles.

B. Critical Issues Regarding Management and Marketing Success

This section examines the structural issues internal to the industry. The objective is to examine internal inefficiencies that impact management and marketing success, identify critical problems, and understand how they arise and why they persist. We begin, however, with a strong word of caution about the problems of treating the symptoms of an economic sickness without removing its causes.

The lack of managerial and technical competence in Ethiopia's textile sector has been previously well documented in a joint 1990 study conducted by IBERC and Werner International, and a 1994 study conducted by the Irish Trade Development Institute. Throughout the duration of these studies, textile sector management experienced a great deal of turnover, yet managers always agreed that they do not employ the necessary technical and marketing skills to succeed. The following questions need to be answered:

70

- Why do the same inefficiencies and inadequacies persist in repeated examinations of textile sector management?

- Why have successive managers failed to seek remedies to problems or skills to overcome shortcomings?

- Why do private sector managers in Ethiopia, with no more formal marketing training than the public sector managers, demonstrate a grasp of effective marketing practices?

- Why have the management boards of public sector enterprises not made recruiting such talent a priority?

If these questions are not confronted and answered, further cycles of replacing managers, providing training, infusing capital, and absorbing losses will continue to be as ineffective as they have been in the past. The status quo that persists is structural in nature and resistant to making the *viability* of the cotton textile sector the primary objective. Viability implies *adaptability* to an environment for survival. Public sector enterprises, which are fundamentally political in nature, try to use political means to make the environment accommodate their rigidity. Most of the recommendations made here and elsewhere in this report will not work unless structural incentives and disincentives are provided.

B1. Cotton Versus Textile Production Capacities

In a developing country such as Ethiopia, the connection between the availability of domestic cotton production and the potential growth of the textile manufacturing sector is vital. No such connection exists with garment manufacturing, unless import policies make foreign fabrics unavailable. But the logistical, financial, and management problems involved with importing a large share of the raw fibers required to feed the domestic textile factories make it very difficult to compete without an adequate domestic fiber supply. In Ethiopia, this *implies* an adequate supply of *cotton*.

Yet there is clearly a limited capability for cotton production in Ethiopia, which cannot be addressed without enabling large-scale, commercial cotton farms. In Section III of this report, the three-year average (1993-95) for cotton production in Ethiopia was estimated at 13,556 tons. Furthermore, an optimistic projection for domestic cotton production would be an increase of 23 percent to 16,648 tons (Exhibit IV-5).

Using representative parameters for spinning and assuming that existing textile spinning plants in Ethiopia could operate at 100 percent of their rated capacity, the fiber consumption of existing spinning enterprises approximates 59,876 tons (Exhibit IV-6). This is slightly more than four times larger than current cotton production and slightly less than four times larger than the optimistic scenario projected for cotton production. If Ethiopian spinning plants were to manage to achieve 95 percent efficiency—a goal expressed by most of the enterprises—then projected cotton production would still be only 29 percent as large as spinning requirements. Even if textile capacity were to settle at the uneconomic level of 75 percent, projected cotton production would reach only 37 percent of spinning requirements. *Therefore, to balance with projected cotton production capacity, capacity utilization in the spinning sub-sector would have to equalize at only 28 percent.*

The scenario summarized above is clearly not feasible. Some combination of the following adjustments must occur:

- The spinning industry will have to down-size to an economically sustainable level.
- The cotton production industry must be enabled to increase its production capacity.
- The spinning industry will have to import additional cotton and other types of fibers.

Exhibit VI-5. Existing Versus Projected Cotton Production in Ethiopia

Farm Enterprises	Average for 1993-95			Projected Production (tons)	Projected Increase (percent)
	Area (ha)	Yield (kg/ha)	Production (tons)		
Abobo	1,365	224	306	413	35
Middle Awash	3,964	749	2,971	3,417	15
North Omo	2,643	309	817	1,430	75
Tendaho	6,045	439	2,653	3,449	30
Public Sector Farms	14,017	481	6,747	8,709	29
Private Commercial Farms	8,530	456	3,898	5,028	29
Peasant Farms	16,800	173	2,911	2,911	0
Total			**13,556**	**16,648**	**23**

Exhibit IV-6. Annual Cotton Consumption Capacity of Spinning Plants in Ethiopia (in Tons)

Type of Spinning	Capacity Utilization				
	100%	**95%**	**85%**	**75%**	**28%**
Ring[1]	56,385	53,566	47,927	42,289	15,788
Rotor[2]	3,491	3,316	2,968	2,618	977
Total	**59,876**	**56,882**	**50,895**	**44,907**	**16,765**

[1]Assumes a representative yarn count of 30/1 Nm, a TM of 664, a front roll rpm of 190, and a spindle speed of 10,050 rpm.
[2]Assumes a representative yarn count of 30/1 Nm, a TM of 746, and a rotor speed of 45,000 rpm.

Further implications are that (1) yarn imports will be necessary to enable weaving plants to survive and grow, and (2) fabric imports will be necessary to enable garment plants to survive and grow. Otherwise, the inability of a commercial cotton production sub-sector to develop will effectively prevent the development of any downstream textile industries.

B2. Import Competition and Regulation

Soon after taking power, the TGE liberalized many imports to meet critical shortages of necessities across the country. Until a year ago, however, textiles remained on the "Negative List," which included imports the government considered would have a negative impact on the nation's economic development. Many "luxury" products such as televisions and video recorders made this list. Other products, such as textiles, were included in an attempt to preserve the viability of domestic manufacturers who were thought essential to long-term Ethiopian development.

In the final years of the Derg, 41 percent of direct government spending and 15 percent of GDP was committed to the military. Accordingly, the demand for military uniforms provided the rationale for making domestic textile mills a matter of national security. When the TGE reduced the military commitment to 20 percent of government spending and five percent of GDP (which is equal in proportion to defense spending in the United States), the strategic value of the domestic textile industry declined and the textile trade was liberalized. Of course, the impact on the domestic textile sector was dramatic because it lost its largest single customer and was confronted with increased competition in civilian markets.

Before liberalization, textiles could enter the country, but they could only be paid for with external financing. This stipulation created the *franco valuta,* a black market that allowed people to import "negative list" products by claiming that the hard currency or the product had been supplied by an expatriate friend or relative. Although this deception was transparent, it was practiced widely, and only flagrant abusers risked retribution.

In 1992, after the collapse of the Derg and the liberalization of trade, legal textile imports surged. In 1993 and 1994, legal textile imports fell back to near pre-liberalization levels (Exhibit IV-7). In the case of garments, legal imports in 1994 were even less than before liberalization. Yet the physical evidence in the marketplace indicated that the availability of imported textiles had not decreased. Indeed, it indicated that the imports had continued to increase.

The contradiction between declining import statistics and increasing import dominance in the marketplace strongly supports the claim made by fabric and garment distributors that a growing portion of imported textile and apparel trade is conducted illegally.

Further evidence of potential irregularities in the textile import market is provided by the number of major exporters of fabrics and garments to Ethiopia. Neighboring Djibouti and the United Arab Emirates, neither of which have substantial textile manufacturing capabilities, are listed as leading exporters of textile products to the Ethiopian market. In fact, several United Arab Emirates suppliers have been cited for transhipments and fraudulent violations of quotas in the United States.

Exhibit IV-7. Textile and Garment Imports to Ethiopia
(Thousand Kg)

Commodity	1990	1991	1992	1993	1994
Yarns	1,638.4	1,058.0	4,674.0	2,504.0	3,033.0
Cotton	NA	38.0	2,104.0	950.0	500.0
Man-made	NA	920.0	2,506.0	1,538.0	2,523.0
Other	NA	100.0	1.0	18.0	10.0
Woven fabrics	362.3	1,391.6	5,515.5	2,070.0	2,028.0
Cotton	71.4	83.7	211.5	92.0	48.0
Man-made	288.5	1,304.5	5,234.5	1,975.0	1,980.0
Other	2.4	3.4	69.5	3.0	0.0
Woven garments	310.6	97.0	553.0	180.0	206.0
Cotton	NA	31.0	248.0	41.0	22.0
Man-made	NA	16.0	78.0	70.0	25.0
Other	310.6	50.0	227.0	69.0	159.0
Knitted garments	24.0	19.0	89.0	35.0	72.0
Cotton	NA	0.0	0.0	17.0	5.0
Man-made	NA	15.0	79.0	15.0	7.0
Other	NA	4.0	10.0	3.0	60.0
Blankets	NA	168.0	274.0	188.0	130.4
Cotton	NA	31.0	26.0	13.0	0.7
Wool	NA	65.0	124.0	136.0	5.7
Other	NA	72.0	124.0	39.0	12.4
Other home textiles	NA	15.0	18.1	13.1	23.2

Why have textile imports returned to the underground economy? In field interviews, fabric distributors and legitimate importers claimed that the continued high tariffs of 79 percent topped by a 10 percent sales tax, make importing very expensive. But because the domestic industry is clearly not able to meet textile needs of the population—now estimated to be 57 million and growing at an annual rate of 3 percent—fabric and garment imports must enter the country. In addition, they perceive a growing demand for man-made fiber fabrics and made-up goods that the domestic industry does not supply.

Because import consumption has been driven outside legal marketing channels by punitive tariffs, actual data on import market share or rates of growth are unavailable. Furthermore, because illegal imports pay only what is necessary to get them into the country as contraband, they are sold at competitive prices. Legitimate Ethiopian garment manufacturers cannot compete with these illegal imports in meeting domestic demand for man-made fabrics (on which they must pay tariffs and taxes). Both the manufacturers and the distributors of domestic fabrics and garments believe that substantially reduced tariffs would enable their legitimate companies to again compete and would make it feasible to bring the textile markets out of the underground economy.

Currently, because of the limited availability and high cost of man-made fiber yarns and fabrics, the domestic textile industry cannot make many fabrics that can compete with those used in imported ready-made products. More easily accessible imported fabrics would allow for the growth of private sector garment manufacturers, who in turn would become more viable customers of fabrics produced competitively in Ethiopia.

Import barriers on garment accessories and sundries (buttons, zippers, etc.) also handicap legitimate manufacturers of textile products. The domestic supply of such inputs is limited and of poor quality. All garment manufacturers interviewed, both public and private, complained about the shortage and poor quality of non-fabric materials. This issue was also highlighted by a national survey conducted by the Ethiopian Private Industry Association (EPIA), in which respondents cited the lack of quality raw materials as one of the greatest constraints to growth in the private sector.

In addition to high tariffs and difficult regulations on imports, the unpredictable and arbitrary procedures used by the customs service add to the risk and cost of importing. In some cases, it is less expensive to import ready-made garments than it is to bring in the components and manufacture the product in Ethiopia.

B3. Globalization and the Information Imperative

By partially opening their economy, Ethiopia is experiencing increased impacts of globalization. These impacts do not exclusively, or even primarily, affect export capabilities. Fundamental shifts in perceptions and practices must occur to compete on a global basis. The effects are felt in the Mercato in Addis Ababa as surely as they are in European market centers. Competition becomes much more dynamic and timely information more critical for a country to compete successfully.

During marketing field interviews in Ethiopia, distributors, retailers, and some mill managers quickly recognized the benefits of functioning in a more globalized environment. Most understood that freeing up the marketplace created an environment for new types of products, new applications for existing products, and new designs and finishes. Many are beginning to investigate new products to fill their capacity short-falls. Some decided through their own observation that cotton and polyester are not necessarily competing fibers; that consumers may demand both to fulfill different needs and wants. Rudimentary evidence indicates that specialization and targeting of market niches will, if allowed to mature, result in new opportunities and greater efficiency.

To exploit the benefits of globalization, the economic infrastructure of the country must be enhanced. Two prerequisites for effective competition in a globalized environment are (1) the ability to communicate quickly and continually with suppliers and customers, and (2) the ability to analyze, internalize, and respond to changing market demands. Fulfilling these prerequisites requires that a capable management have access to an adequate infrastructure. For example, Ethiopia's dominant global competitors—India, Pakistan, South Korea, and Japan—have evolved advanced communications practices to link marketing and production departments as well as customers and suppliers. Note that the operative word is "practices," not "technologies." Japan's technology is quite different from India's, but both have purposeful and effective information collection and coordination.

In the public cotton textile sector of Ethiopia, information is still predominantly collected by hand and stored on paper. Consider the following:

- All responses to a PESA survey of textile mill activity were submitted on typed or hand-written sheets of paper.

- Office automation was observed at only one sales office of the publicly held mills that were visited. Observations indicated that information regarding the mills' and distributors' performance is stored on paper and obtained only with substantial effort.

- Out of seven mill responses to the PESA survey, five contained readily identifiable errors in the historical sales data. One was so flawed that it was returned to be redone.

- During management interviews, data considered essential and readily accessible in a market-oriented business, such as the average profit margin for each product line or product performance by distribution channel, were unavailable or accessible after committing the bookkeeping staff to hours of work.

As the number of potential competitors and customers increase in a globalized environment, businesses need to be able to access and share all facets of the business' performance across the enterprise's functional groups. A paper-based information system severely compromises this ability.

In contrast to the public sector, office automation was observed to be an integral part of small private sector business in Ethiopia. In visits to a representative set of private sector garment manufacturers, importers, and distributors, team members observed that *every one* of the offices was equipped with current office automation technologies, including the newly released Windows 95, which compares favorably with similar practices in the United States. And much information that was difficult or impossible to obtain from the public sector enterprises was readily available from private enterprises.[1]

Ethiopia does not presently have the telecommunications infrastructure needed to compete in export markets or against global competition in its own domestic market. Consider the following:

- Multi-line telephones are a rarity.

- Public faxing facilities are illegal outside the Addis Hilton and the government-run telecommunications office.

- Cellular phone service does not exist at all.

[1]It is not shocking that private sector firms in Ethiopia are automated, in view of a recent study of Ethiopian small business development, conducted on behalf of the World Bank, which concluded that 37 percent of new small business owners possessed college degrees. This is higher than in the United States, where studies have found a strong correlation between the owner's level of education and the propensity to automate.

- International telephone service, when available, is extremely expensive.

- The internet and the electronic mail services it supports, which is rapidly becoming the communications medium of choice for many businesses, is unknown in Ethiopia.

Such regulatory strangling of communication capabilities—for the transparent purpose of enabling a government monopoly over telecommunications technology—imposes great disadvantages on domestic enterprises. Competitors on another continent can now communicate with and serve Ethiopian markets better than domestic enterprises. This lack of a reliable and cost-effective communications network obviously hampers the Ethiopian industry's ability to sell in foreign markets.

B4. The Management Imperative

Even if public sector firms were able to improve access to business information, using such knowledge requires the ability to interpret and disseminate it, and determine an appropriate response. Professional management should have this ability; however, after 20 years of centralized distribution of supplies and finished products through the Ethiopia Domestic Distribution Corporation (EDDC), Ethiopia's cotton textile sector lacks such management.

Public sector textile enterprises have become so dependent on their distributors for marketing that sales are perceived to end at the factory gate. Information on sales, profits, and returns are not tracked or used in decision making. The value of this kind of information and ways to use it must be reestablished. Managers must understand how the information being tracked is useful in understanding market issues, setting priorities in factory operations, and making strategic business plans. The enterprises apparently have no institutional memory about tracking customer data to benefit their business.

Without a doubt, the fastest approach to developing an indigenous management capability that is part of the modern information culture is through the so-called "tyranny of the marketplace." This is done by exposing enterprises to the consequences of failure, making the risks associated with doing nothing commensurate with the risks of trying to engage the market. Current government policy encourages bureaucratic paralysis and retards the transition to a market orientation.

Two fundamental observations about management capability will be emphasized in this section:

- An obvious implication of the lack of sophisticated management expertise in Ethiopia is that businesses become large before they have time to mature. Most businesses should remain small for awhile. Small businesses usually have only one or two key decision makers; communication is relatively simple and straightforward. With large-size comes more complex communication, increased bureaucracy, geographically dispersed decision-making processes, etc. In short, large businesses require a specialized management class that cannot be indigenously sourced except over many years.

- Notwithstanding Ethiopia's inherently weak management, other structural/institutional reasons prevent the establishment of proper managerial foundations. Not all managers who have been cycled through public sector cotton textile enterprises during the last five years were incompetent. The symptoms of structural dilemmas are many; because they are treated in the previous section on organization and management, they will not be elaborated here.

B5. Organizational Structure

The current organizational structure (see Exhibit IV-8) apparently has changed very little since the time of the Derg. A general manager has responsibility for the enterprise, with a commercial manager and an operations manager reporting directly to him. The commercial manager is responsible for all buying and selling while the operations manager is responsible for all production decisions (including product development). This arrangement is counterproductive to a market-driven environment. If someone has responsibility for both buying and selling, structural incentives will make him become the sales agent of his suppliers. His focus will be on selling what is produced, rather than on producing what customers want to buy.

Exhibit IV-8. Current Organizational Structure

General Manager (Focused on cost containment)		
Commercial Manager		**Operations Manager**
Selling		Production scheduling
Marketing and advertising		Equipment maintenance
Equipment purchase		Product design
Materials management		
Vendor selection		

Placing product development under the operations manager causes further structural distortion because operations personnel focus on products rather than what the customer needs. The imperatives of consumer demand tend to be eclipsed by real or perceived technical limitations.

In a structure more appropriate in a market-driven environment (see Exhibit IV-9), product development responsibilities are shifted out of operations and put under the responsibility of the commercial manager. Also, a customer service entity is established under the commercial manager, which together with product development personnel, advocates for customer demand to balance the viewpoint of the operations manager whose goal is to minimize costs and simplify production activities. Conversely, vendor selection, purchasing, and materials management are shifted from the commercial manager to the operations manager to ensure that proper equipment, raw materials, and supplies are obtained for production.

To succeed in a demand driven environment, an enterprise must stay informed about consumer demand and respond to market changes. It must develop existing products and identify new products, market niches, and customers. It must be structured to debate core assumptions and move toward new approaches. While seamless teamwork is necessary for excellence, it must incorporate conflict that tolerates or even encourages the debates that lead to new ideas. A customer advocate ensures the market is serviced, and a production advocate works to contain costs and achieve technical efficiency.

Exhibit IV-9. Alternative Organizational Structure

General Manager (Focused on quality control and cost containment)	
Marketing Manager	**Operations Manager**
Selling	Production scheduling
Marketing and advertising	Equipment maintenance
Product design	Equipment purchase
Customer service	Materials management
	Vendor selection

B6. Domestic Market Data

The lack of market information in Ethiopia has been repeatedly observed. The European Union cited the absence of data as a reason for relying on field interviews to examine commercial lending to microenterprises; this information was considered necessary to rationalize bank lending practices to the informal sector.

The efficient allocation and distribution of resources in a market system can occur only to the extent that information is accurate and available. Of course, no transaction takes place under conditions of perfect information, but the paucity of information available to the Ethiopian market is extreme. The most recently published data on general economic conditions are for 1991-1992. The 1992-1993 data are not scheduled to be released until early 1996-1997. This four-year lag becomes a six-year lag for more detailed industry data. Such lags are incompatible with the government's commitment to market reform. The lack of current trade data, especially regarding imports, is a great disadvantage to Ethiopian businesses concerned with supplying domestic markets. Given the Ethiopian government's commitment to exporting as an economic development tool, its failure to collect and disseminate export statistics is baffling.

As already noted, textile consumption is sensitive to changes in income and population. Therefore, timely and accurate information on (1) income growth and its components, and (2) population shifts provide the basis for informed market segmentation, product development, and production scheduling.

Under a Marxist regime, resources are allocated on an command basis. Collecting market data is seen as redundant and potentially embarrassing. Thus, no meaningful historical market data are available in Ethiopia. Furthermore, in an economy emerging from 20 years of authoritarian rule, consumers are reluctant to provide information on personal consumption, especially in areas where technically illegal activities dominant. Buyers in the central markets of Harar and Addis Ababa, for example, were concerned about government inquiries when asked about purchasing patterns.

In discussions about the critical lack of economic and market information, one Ethiopian government official expressed the opinion that "it is up to the enterprises to collect this data." However, much of this data would be too costly for individual enterprises (or even individual industries) to collect. This task is an integral part of infrastructure, such as roads, communication, and energy generation and delivery. Cumulative benefits are very large compared to cumulative costs, but cumulative costs are so large that they must be spread over the entire economy. It is one example of where government funding (using general tax revenues) should be channeled.

Two peripheral reasons for the Ethiopian government to consider building up an information infrastructure include:

- Opportunities for cooperation between the government and Ethiopian business, and public and private enterprise sectors, to foster a culture of cooperation rather than distrust. Trade and professional associations that represent business enterprises become the government's natural allies in building up information infrastructure.

- Assistance in developing an information infrastructure may be requested from, and will likely be favorably considered by, other governments with experience with gathering, analyzing, and disseminating data and other information. Developed countries see this as a *bona fide* part of building up a developing country's total infrastructure. (For example, the International Statistical Programming Center (ISPC) in the U.S. Bureau of the Census has assisted several Eastern European countries and former Soviet states in developing market and industry monitoring capabilities.)

B7. Marketing Issues

Marketing may be defined as the practice of identifying and maximizing the satisfaction of the customer through the limited resources of the enterprise. To do this, the market is segmented by the needs, behaviors, and characteristics, and product uses relevant to customers. Products, channels of distribution, and advertising means are then designed to target profitable segments.

Segmenting a market requires evaluating the relative size, growth rate, spending power, and risk of each identifiable segment, and then choosing from among them. Ethiopian textile managers do not have the information and the knowledge to evaluate the relative value of one segment over another; therefore, they will not risk ignoring some markets in favor of others. As a result, all the factories produce a similar range of fabric for a homogeneous consumer market. An example of this behavior is the Awasa Textile Factory:

- Awasa manufacturers 29 varieties of 13 different constructions. To maximize efficiency, a mill of that size should be running no more than four different constructions with at most four variations or styles per construction. Which constructions should be emphasized and which abandoned?

- Awasa's dyed and printed twills and drills account for about 53 percent of its current volume and 68 percent of the value of its sales. Yet these fabrics are primarily suited to uniforms and are too heavy for much of the non-uniform market. Should it expand output of these heavier fabrics or shift production toward lighter weight fabrics?

- Greige goods account for a large share of Awasa's sales and are their only export product. Should it nevertheless move to produce more printed and dyed fabrics? (This decision could be impacted by negotiations with the European Investment Bank to install new printing capacity in the Bahir Dar Textile Factory.)

- Rural Ethiopian consumers are the major customers for greige fabric. Should Awasa focus on capturing a larger share of that market? This decision requires information on variables such as (1) the rate of income growth in rural versus urban areas, (2) regional differences and trends in income, (3) proportion of rural disposable income spent on made-up clothing and fabrics and how this proportion changes as family income increases, and (4) differences in regional employment patterns and their influence on the trade-offs between made-up clothes and greige fabrics?

Answers to these and many other questions are currently unavailable and would be much too expensive for a single enterprise such as Awasa to collect. The result is that this enterprise cannot determine which segments are better risks than others. The observed tendency, here and elsewhere in Ethiopia, is to minimize perceived risk by serving as many markets as possible. Although inefficient, this choice is not irrational given management has little more than last year's sales data on which to base their decisions.

In addition to this handicap, most public sector textile managers do not understand marketing in its entirety. Marketing is commonly misperceived as sales and advertising. None of those interviewed understood that product development was a marketing function; they saw it as a part of production. A distributor who served the home sewing and decorative fabrics markets indicated that fabric designs were selected on the basis of those that had sold well in the past. When asked which designs were intended for home sewing and which for curtains, the interviewee explained that any fabric could be used for any end-use. This is, however, untrue. Any supplier who provides products for specific markets is likely to win the competition for the targeted segment. This is one more illustration of the supply-driven approach to marketing that dominates Ethiopia.

Little advertising is done, and when it is, there is no evidence that customers have been defined and targeted. For example:

- One enterprise had an advertising budget for television, radio, and newspapers but made no attempt to target customers. Television was thought to be sufficient for building sales to government agencies because "they watch television just like everyone else." One garment factory runs television and radio advertisements to promote the factory, yet the factory's name is omitted from the garment labels because consumers tend to discriminate against clothing made in Ethiopia.

- Only one textile mill had a printed brochure, but it said nothing about the uniqueness of the company or the segments it served. Some said they intended to produce brochures, while others said they were too costly to print. Still others simply stated that sales was the distributor's job. None of the mills visited displayed a corporate logo in their sales offices.

When asked to describe their market, several enterprise managers listed their distributor or distributors, which indicated a confusion between channels of distribution and markets. The attitude seems to be that sales and product responsibilities end at the factory gate. Managers commonly complained that distributors were not serving the enterprises well enough, revealing a failure to understand that people trying to make sales in an open market must serve the buyer, their customer.

Perhaps because of the dearth of market information, textile enterprises have come to rely on sales data as a proxy for consumer demand. This practice is misleading and can be justified only if the market is static, with no changes in consumer expectations or competing products. This is clearly not the case in Ethiopia, however, where consumer choices expanding and domestic consumers are becoming more heterogeneous. By looking back at sales data instead of forecasting consumer demand, enterprises will completely miss the changes revealed by national income and demographic statistics.

Changes in consumer demand are somewhat difficult to discern because they are obscured by low per capita income levels; the dominance of rural consumers; and a single, attenuated season for clothing textiles that runs from fall harvest to spring planting. More diversified, industrialized countries have distinct changes of season and several clothing "seasons." Ethiopia has only one major season, however, so change can be more difficult to detect and easier to ignore.

Nevertheless, one cannot assume that the Ethiopian economy is static and that marketing decisions will hold for extended periods. Consider that, in just the last five years, the government has:

- Liberalized the labor market to allow for mobility among industries (although regional restrictions remain)
- Liberalized trade, thus increasing the number of competitors and the selection of products in the marketplace
- Removed some of the most restrictive price controls

The imposition of these structural changes on an economy makes the use of past production and sales totally invalid as indicators of current and future market behavior.

B8. Passive Marketing Behavior

The lack of understanding of how of textile marketing functions in an open, competitive market follows from almost two decades of no-engagement sales activities and a less than full range of marketing activities. The failure to make efficient, productive, and profitable operation the basis for determining whether a public sector enterprise continues to exist has fostered a passive attitude toward marketing that is unworkable in an open market.

Until very recently, most textile enterprises have limited their means of distributing goods to a single wholesaler or distributor (sales agent) to whom each mill gave exclusive distribution rights. Wholesalers, however, were not committed to excluding other domestic or imported textile products from their portfolio. To grant such one-way exclusivity is an extremely naive and passive attitude. Public enterprise management expected the distributor to do all the marketing, and then felt betrayed when distributors served customers rather than suppliers. A more basic failure is the inability to understand the needs of textile consumers. Distributors have not insisted that public sector enterprises solve production and marketing problems because they are not part of the management of these enterprises. Instead, they solve the problems of those they do business with as a condition of that relationship. Distributors have increasingly had to use other suppliers to satisfy their customers.

Passive marketing behavior is equally apparent in institutional products such as uniforms, bedding, and towels. For example:

- All public sector textile enterprises have watched the construction of the new Sheraton Hotel with no attempt to solicit a contract to supply textile products. The explanation is that everyone was waiting for the Sheraton to issue a tender, an ineffectual habit that persists even though the market has been liberalized. Meanwhile, a private sector garment manufacturer took the initiative and obtained a contract. There are complaints that this private sector enterprise did something wrong; however, it really did something right and has provided an object lesson to the public sector.

- No public sector manufacturers of bed sheets were observed to focus on marketing to institutions such as hospitals, the military, or hotels. Discussions about this revealed that no distinction is made between home versus institutional needs. Again, no public sector enterprise showed an inclination to visit with representatives of these institutions until a tender was issued.

This passivity extends into export marketing as well, with the textile industry relying almost totally on foreign buyers' agents to obtain sales. On several occasions, when relationships with these agents have soured, the mill has been left with no contacts and no means of replacing lost sales. There are no export marketing budgets, no promotional materials, and no systematic development of contact lists. An Ethiopian uniform manufacturer expressed a desire for catalogs published by foreign manufacturers to assist the enterprise in creating new product lines. To obtain such information, many global uniform manufacturers attend the Uniform and Professional Apparel Show, which is held simultaneously with the Fall IGEDO Show in Dusseldorf, Germany. In two or three days, manufacturers meet with potential customers, explore potential partnerships, size up the competition, and study new product designs for the entire European market. Of course, substantial amounts of money must be budgeted and enormous amounts of creative energy expended in such activities to build export markets. Even then, success will come only with timely delivery of high quality products.

B9. Product Innovation and Copyright Protection

Product innovation is an integral part of marketing. It is important for success in domestic and international markets, but it is more critical for international competition. The market intelligence required to identify a need precedes the design and construction tasks needed to fulfill that need. After success in these areas, manufacturing the product is relatively easy and inexpensive. Therefore, if the legal system permits competitors to simply copy and sell the products, the enterprise which developed the product is denied the chance to recoup development costs and make the money to pay for such innovation. Unfortunately, such design piracy is allowed in Ethiopia; stopping it will require adequate copyright protection.

Interviews with exporters revealed their awareness that Ethiopian fabric and garment manufacturers have no real design capabilities; they cannot make fashions for higher value garments in men's or women's wear. Interviews with managers of textile enterprises revealed their awareness of the cost of developing special designs. Without the capability to protect the investment made in product design, an exclusive focus on cost containment becomes the rational choice. This is especially true in a developing country such as Ethiopia—with its atomized consumer market, undeveloped communications, and inadequate transportation—because market research and product innovation in made more expensive by environmental conditions.

C. Analysis of Major Textile Market Segments

There are at least seven distinct market segments for textile products in Ethiopia, as follows:

- Made-up apparel
- Apparel and decorative fabrics for home sewing
- Salvage clothing
- Uniforms for state enterprises
- Uniforms for private enterprises
- Bed sheets for home use
- Bed sheets for institutional use

As noted earlier, it is impossible to gauge the relative strengths or sizes of these markets. There are no accurate, detailed data on population and income, institutional textile markets, or the ways in which other economic sectors respond to changes in government policy. Restrictive policies and inconsistent programs of the past drove most economic activity underground and ensured that little reliable historical data would be available. Today, although there have been changes, much of the textile market remains underground due to extremely high tariffs. Therefore, quantitative analysis of the market is not possible.

Exhibit IV-10 represents a qualitative summary of characteristics of these seven market segments and the dominant products in each segment. Industry participants disagree as to what extent these separate market segments compete among them. For example, some believe that salvage clothing amounts to what economists call an inferior good; i.e., the quantity demanded decreases as income increases. If this is true, economic growth will progressively remove the clothing from the market. Others believe that salvage clothing offers consumers enough design features, fiber variety, and basic value that there will continue to be a demand for it regardless of income growth. If this is true, only improved domestic textile products will displace salvage clothing.

C1. Made-up Apparel

This market probably represents the greatest threat and the greatest opportunity to the domestic textile industry; it will probably be the dominant market in the future. By all accounts, imports of ready-made garments are growing; however, the lack of trade data since 1992 make confirmation of this impossible. Visual inspections and discussions at several major marketplaces in Ethiopia corroborated the fact that foreign goods dominate the market. Many retailers claimed that they do not stock Ethiopian-made garments because their customers did not want them. Others who did stock them hid them among imported garments to avoid customer discrimination.

Exhibit IV-10. Summary of Major Textile Market Segments in Ethiopia

Market	Characteristics	Products
Made-up apparel	Higher income market; urban customer; discriminating customers; sophisticated designs; differentiated product	Many imports; man-made fibers; rich prints and highly designed; domestic products seen as inferior
Fabrics for home sewing	Lower income market; rural customer; traditional fabrics; simpler designs and greige fabric	Abujedid; Asnecketch; white mull; poplins and sheetings; cotton; dark colors
Salvage clothing	Lower income market; foreign made; informal infrastructure and black market; diverse quality	Wide variety and international styles; dominated by knit constructions
State enterprise uniforms	Stagnant or declining market; unmotivated consumer; lack of design; import share increasing	Heavy weight twills and drills; overalls and coveralls; uniforms - low pricing point
Private enterprise uniforms	Moderately growing market; very discriminating consumer; no labor union influence	Highly designed for function and looks; lower quantity per employee; higher pricing point
Bedding and blankets for homes	Moderately growing market; discriminating consumer; demands more differentiation	Growing imports; growing polyester content; growing share of prints
Bedding and blankets for institutions	Diverse customer needs; large volume and low margin; requires account management	Bleached white is common; durability rather than design

Both importers and retail shops seemed to believe that consumers preferred the higher man-made fiber content that is provided by the imported textiles. Domestic garment manufacturers are discouraged from diversifying the fiber they use by the high tariffs applied to imported fabrics; currently, the majority of domestic fabrics are 100 percent cotton. To participate in the growth of this market, however, Ethiopian textile factories must shift toward the use of polyester, which will require importation of polyester fibers and yarns. In addition to higher man-made fiber content, the made-up garment market demands sophisticated, high quality prints and more stylish designs. Domestic manufacturers also face high tariffs on the sundries, notions, and other accessories needed to manufacture stylish garments.

There appears to be a risk that the domestic garment industry will be denied the opportunity to compete to keep them structurally tied to the domestic textile manufacturing industry. Restricting finished garment imports will encourage the domestic industry's status quo and drive even more of this trade onto the black market. Even if highly repressive measures succeeded in restricting consumer access to preferred products, it would amount to hurting millions of Ethiopian consumers to benefit only thousands of textile workers. The net loss to the entire Ethiopian economy would be astronomical.

This market segment requires far greater commitment to customer service than the domestic textile industry has been able to make. For domestic garment manufacturers to be responsive, they must have access to shorter fabric runs with more varied finishes. Given the very imprecise market and consumer preference information available in Ethiopia, distributors must order a variety of designs in short runs at the beginning of the season to limit their risk. Domestic garment manufacturers and fabric distributors both claimed that they were being driven reluctantly to more expensive imported fabrics because domestic mills were unwilling to meet the more exacting requirements of this higher value-added market segment.

The textile factories, with their strong bias toward production, tend to see this problem as outside their domain. They tell the distributors that their facilities are designed for long runs and that they cannot handle short runs; however, if the designs succeed they will then supply the long runs. But the market is simply too dynamic for such tactics to succeed. The same foreign sources that supply the initial orders also compete for the longer runs—and are well positioned to do so. *Thus, by not finding a way to supply initial short run orders, the mills lose out on the long run orders that would greatly increase their profit potential.*

C2. Fabrics for Home Sewing

Consumer apparel fabrics account for 65-75 percent of the domestic textile factories' output in square meters. The vast majority of this is in traditional Ethiopian fabrics: abujedid, asnaketch, and white mull. While the domestic textile enterprises seem to believe that this is a safe haven, this market is probably also being squeezed by ready-made apparel on the upper end and salvage clothing at the lower end. In interviews with fabric shops in Dire Dawa, Harar, and the Mercato in Addis, these fabrics are stocked only because a residual demand for traditional dress remains. The increased opportunities for more and different types of work will probably reduce the prevalence of home sewing. At the same time, alternatives to home sewing (ready-made apparel and salvage clothing) are becoming less expensive, which will further erode this activity. Thus, what was once thought to be a core market may also be vulnerable.

The traditional garment market has two major sub-segments. One is highly stylized, ceremonial garments that are largely supplied by home looms. The other is simple everyday garments, the sub-segment available to the domestic textile factories. Obviously, this market is dominated by the lowest income, most price sensitive consumers.

Managers of public sector textile enterprises gave the following reasons for focusing on the low-margin constructions used for traditional, everyday garments:

- They are locked into this market because their technology restricts their output to 100 percent cotton fabrics.

- The quality of available cotton is not sufficient to produce the finer yarns needed for higher quality fabrics (such as shirting fabrics).

- They are not technically capable of producing finished fabric at a level of quality competitive with imported fabrics.

This project's technical team concluded that these assumptions are true for some but not all enterprises. These assumptions no doubt help explain why the share of industry output of home sewing fabrics is increasing. But the dismal performance of these fabrics in the marketplace is obvious; large inventories of them currently sit in distribution channels and retail stores.

C3. Salvage Clothing

Demand in the salvage clothing market appears to be driven by two factors: income and lack of reasonable substitutes. Used clothing seems to be most popular option among the poorest people, whether in Ethiopia or other African countries. Clothing is imported by the bale and resold in specialty markets outside major cities. The United States is the largest supplier of used clothes to Africa; they are the eighth largest export item from the United States to the African continent.

Recent recommendations by U.S. businesses to legalize this trade and establish an inspection and distribution center serving all of East Africa from Ethiopia was met with unqualified resistance from the Prime Minister's office. Resistance is apparently due to the belief that salvage clothes will displace traditional home-sewn clothing made from domestically woven 100-percent cotton fabric among the rural poor. While there is no data to prove this assumption, qualitative evidence and economic theory contradict it. Regardless, denying rural consumers a choice will further impoverish an already impoverished group. A more humane response would allow the domestic textile sector to compete freely to become the chosen supplier of rural consumers.

The higher priced salvage clothing market apparently fills an otherwise unmet demand for western styles, colors, and finishes. Particularly in this market, a reduction in import duties on man-made fiber fabrics would foster the development of a domestic garment manufacturing sector that could offer consumers a more competitive alternative to the salvage clothing market.

The ability to compete with the quality of cast-off imported garments is a necessary condition for successfully exporting to those countries. For example, many children's garments enter the salvage clothing market in a like new state. One U.S. children's wear manufacturer, the largest in the country, guarantees that the child will grow out of the clothes before the garment wears out. Because of this, purchasing second-hand clothing for children has become an acceptable practice in the United States even among middle income households. The Ethiopia textile sector will have to learn to compete with this stiff competition.

C4. State Enterprise Uniforms

Fabrics for state enterprise uniform apparel accounts for a substantial share of domestic mill output. Twills and drills that go into overalls and similar worker uniforms account for about

26 percent of textile mill output, second only to traditional apparel fabrics such as abujedid and asnaketch (which account for about 38 percent). The current demand for uniforms in the state-owned enterprises is driven more by labor union contracts than by actual product use. The size of the uniform apparel market is artificially inflated by labor agreements that require employers to provide all workers with a specified number of uniforms every year. These contracts are obviously intended to serve the mills and not the workers; in some cases, even the name of the mill from which the fabric must be sourced is included in the contract.

Workers know that uniforms are not a necessary requirement for their continued employment, so they try to convert excess uniforms into income by selling them. On roadsides not far from Addis Ababa, people sell overalls and other work wear that have been purchased from factory workers. Managers of textile factories know that these uniforms will be worn as required or sold into the second-hand market; therefore, they have little or no concern about fabric quality.

So many uniforms, especially overalls, have found their way into resale markets that managers of non-textile public enterprises now find that they can partially meet the requirement to provide uniforms by repurchasing them. This nonsense persists because the damage done from creating an artificial demand is not well understood. These labor contracts serve to prevent the textile industry from shifting to products that would have a higher social value. The inevitable contraction of the public enterprise sector in Ethiopia ensures that this market is in an irreversible decline.

C5. Private Sector Uniforms

The private sector uniform market has much more in common with the ready-made market in consumer apparel than it does with the market for state enterprise uniforms. The three major sub-sectors in this market are industrial uniforms, service sector uniforms, and school uniforms. In all of them, the purchase decision is made by the worker or the enterprise owner. In either case, the buyer is focused on product quality, performance, and value. While this is a more discriminating and competitive market, it offers successful participants higher margins because of the attention to performance and quality. This is ensured by the following:

- In industrial end-uses, performance is directly related to durability. Consequently, those mills capable of switching to polyester fabrics can succeed in this market.

- In service sector end-uses, finishes are of primary importance. The fabric must be stain resistant, possess color fastness, and maintain an attractive appearance over time. Consistent dyeing and printing capabilities within runs and over time are critical.

- School uniforms, purchased by parents but worn by children, require competitive pricing, durability, and easy care.

The private sector uniform market requires polyester and polyester blends and a management that emphasizes quality control.

C6. Bedding and Blankets for Homes

Decorator and domestic fabrics are perhaps the least exploited market in Ethiopia. The lack of quality and variety in printed fabrics, along with the refusal to commit to designing fabrics specific to home furnishings have kept domestic manufacturers from competing for the upper end of this market. This is supported by the expressed belief of textile enterprise managers and distributors that all the prints produced could be used in any application ranging from women's apparel to bed sheeting to window treatments.

When design is a factor, domestic products are discriminated against to a great extent. In the Mercato in Addis, even Awasa's solid-dyed sheets are relabeled with "Made in Taiwan" to mislead the consumer. Domestically produced sheets are as ridiculed as domestic apparel fabrics. However, this is less of a problem with lower-end children's bedding, as illustrated by one customer who commented, "It doesn't matter as much what my child wets." While the strong birth rate may provide opportunities in children' bedding, margins are thin and almost every factory has identified these products as something it can make. Currently, the price competition is fierce.

C7. Bedding and Blankets for Institutions

This market again demonstrates the unwillingness of Ethiopian textile enterprises to isolate and target specific opportunities. Performance requirements of, for example, a sheet used in an institutional environment are different from the requirements of a sheet for home use. Such institutional products will undergo more washing and more abuse (e.g., hospital sheets are sterilized).

Different institutions, such as the military, prisons, hotels, or schools, have different product performance and customer service requirements. Yet managers of textile factories that produce bedsheeting do not seem to recognize this. One manager that actually advertises on television insisted that the same commercials could serve both home and institutional users.

Institutional bedding customers tend to order large volumes in bulk, while spreading deliveries out over time. Because of their volume purchases, they tend to expect special discounts, credit terms, and preferential treatment when there are shortages of raw materials. Nevertheless, they are often motivated by factors other than price, such as product reliability, guaranteed flow of supply, and strict quality controls. Yet both textile mills and garment factories often leave their institutional customers in the hands of the same third party distributors that serve consumer markets. None maintain a sales representative to work directly with government agencies.

D. Textile Manufacturing Sector Profile

The commercial textile manufacturing industry is comprised of eight publicly held enterprises and one jointly held enterprise (Ethio-Japan). They account for an estimated 90 percent of textile production in Ethiopia. In addition, the government operates two yarn spinning facilities. The eight factories make a broad range of fabrics for domestic consumption. Aside from a small amount of knitted fabric produced by Adei Ababa, the entire industry output is in woven fabrics.

Before fiscal year 1991-92, the Ethiopian textile industry was governed by the National Textile Corporation (NTC), which attempted to manage supply and demand through strict price controls. The factories were allocated raw materials, and EDDC allocated their outputs. In 1991, the Derg Regime was removed from power, the EDDC dissolved, and import restrictions lessened. In 1992, price controls were lifted and the Public Enterprises Proclamation No. 25/1992 was enacted. In 1993, the NTC was officially dismantled.

Since all decisions regarding production volumes, sales, product selection, or prices before 1992 were quite arbitrary and unrelated to market forces, any time series or trend analysis on these markets would be meaningless and misleading. Sales data back to 1989-90 are useful only to the extent that they provide a sense of the transitional upheaval (Exhibit IV-11). For all the industry's products, sales plunged to about half the pre-transition level; since then, only blanket sales have returned to and exceeded former levels.

One of the most pronounced changes since the liberalization of the industry has been a shift of industry production toward low margin, traditional greige fabrics and solid bedsheeting (Exhibit IV-12). The conventional wisdom driving this trend follows from a lack of market orientation and a dearth of market data from which to develop and test independent hypotheses. Somewhat surprising is that public textile sector's share of heavy weight twills and drills eroded. With a mandated uniform market during the 17 years of the Derg, the industry should have the advantage in manufacturing these constructions; however, it did not develop domestic or export markets in which this fabric construction could be sold, and yet maintained production capacity. The dramatic reduction in military needs also contributed to the reduction in demand for heavy weight drills. Canvas fabrics have been particularly hard hit. The industry has failed to compete effectively even within its own borders for the remaining uniform business. For example, the national police department recently chose to source its most recent order from a South Korean apparel manufacturer.

Quality problems cause the contraction and the concentration of textiles manufactured. Domestic manufacturers find themselves unable to compete against higher quality imported fabrics and finished products. Therefore, they shift toward the only textile products that importers do not supply; evidence suggests that domestic consumers are moving away from 100 percent cotton abujedid or asnaketch toward polyester and nylon finished garments and salvage clothing. As a result, domestic mills are shaving margins, reducing quality further, and concentrating even more. This vicious cycle must be stopped to turn this industry around. This reversal can only be achieved through increased market intelligence coupled with incentives to accept the risk inherent in developing market outlets. Both of these requisites are currently missing from the industry.

E. Evaluation of Private Sector Textile and Apparel Enterprises

The private manufacturing sector in Ethiopia was largely disabled by sweeping nationalization in 1975 and has been subjected to persistent suppression over the last two decades. In 1989-90, the last year for which any detailed economic data are available, the private sector contributed less than four percent to gross value of production in manufacturing, about five percent to wages and salaries, less than six percent to employment, about three percent to value added, and about two percent to fixed capital assets.

There would be no private sector textile industry in Ethiopia except for the Ethio-Japanese Nylon factory, which is half-owned by the government. In addition to this integrated textile factory, seven knitting establishments and three apparel manufacturing enterprises are privately owned.

Exhibit IV-11. Ethiopian Textile Industry Sales

	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
Fabrics (thousand square meters)						
Akaki Textile Factory	22,676	10,133	12,272	14,209	12,374	16,447
Arba Minch Textile Factory	--	--	--	3,209	3,896	3,137
Awasa Textile Factory	6,011	8,129	5,701	3,116	4,434	4,611
Bahir Dar Textile Factory	12,308	8,817	8,936	7,352	9,295	13,143
Dire Dawa Textile Factory	26,890	5,665	4,180	8,972	12,578	11,113
Ethio-Japan Textile Factory	5,000	2,978	2,408	2,971	5,079	5,161
Kombolcha Textile Factory	9,463	5,475	3,711	3,518	6,987	9,929
Debre Birhan Blanket Factory	54	55	6	30	18	7
Total	82,402	41,252	37,214	43,377	54,661	63,548
Cotton Yarn (thousand kg)						
Akaki Textile Factory	1,365	224	1,440	397	810	683
Adei Ababa Textile Factory	2,684	1,898	1,367	954	1,177	1,121
Arba Minch Textile Factory	--	--	--	89	300	327
Awasa Textile Factory	6	68	59	0	8	93
Bahir Dar Textile Factory	37	16	71	10	9	282
Dire Dawa Textile Factory	1,800	775	674	737	1,486	1,392
Edget Yarn Factory	1,414	1,264	1,257	1,020	1,030	774
Kombolcha Textile Factory	376	95	49	224	260	254
Total	7,682	4,340	4,917	3,431	5,080	4,926
Acrylic Yarn (thousand kg)						
Dire Dawa Textile Factory	664	201	94	456	486	535
Blankets (thousand square meters)						
Akaki Textile Factory	1,235	808	688	1,365	882	847
Adei Ababa Textile Factory	939	856	383	716	808	985
Debre Birhan Blanket Factory	1,335	373	422	2,298	3,170	3,470
Total	3,509	2,037	1,493	4,379	4,860	5,302

Exhibit IV-12. Changing Market Shares of Woven Fabric Constructions (Percent)

Constructions	1990-91	1994-95
Bedsheeting	10.9	16.0
Other domestics	7.2	1.7
NSK	10.3	2.6
Poplin/broadcloth	16.5	5.5
Sheeting	0.0	0.1
Shirting	1.9	3.6
Traditional	29.9	59.6
Twills/drills	23.2	10.9

Ethiopia's official statistics do not include the pervasive hand-loom industry. The *Statistical Abstract of Ethiopia* includes only those manufacturing establishments "which have 10 or more persons engaged and use power-driven machines." This large cottage industry or informal sub-sector, which accounts for a substantial number of jobs, is discussed in greater depth below. Based on the above definition, however, Exhibit IV-13 summarizes available data on the economic contributions of the entire formal textile sector versus the private formal sub-sector, both relative to the economic contribution of Ethiopia's total manufacturing base. It shows that the textile sector's contribution was approximately 18 percent, 30 percent, and 40 percent to gross value of production, fixed assets, and employment, respectively, while the private sector contribution and share was nonexistent.

There is some hope for private sector development in private small-scale textile and apparel manufacturing enterprises not included in the *Statistical Abstract of Ethiopia*. As shown in Exhibit IV-14, data available for 1986-87 indicate that there were 7,600 small-scale manufacturing enterprises in Ethiopia, with about 28 percent in textiles. Moreover, the textile enterprises employed about 25 percent of all workers in these small-scale industries.

Under the Derg Regime, cooperatives were established with a significant amount of coercion, then began to disband after the regime ended. Surveys made by the Ministry of Trade and Industry in 1986-87 indicate that there were 737 cooperatives (Exhibit IV-15). With 54 percent in tailoring and 35 percent in weaving cooperatives, the two categories accounted for 86 percent of all cooperative members in Ethiopia. It is assumed that some of these cooperatives still exist and that the members of those that disbanded have continued to function as small or microenterprises. This sector's share of total fabric production is unknown; however, hand-loomed fabrics account for almost all formal traditional or ceremonial dress.

Exhibit IV-13. Contributions of Textiles Versus Private Textiles Relative to Contribution of Ethiopia's Total Manufacturing Base, 1989-90

Manufacturing Sector	Gross Value of Production		Value of Fixed Assets		Employees	
	Thou. Br	%	Thou. Br	%	Number	%
Textile sector	451,925	18.2	251,049	29.9	33,073	40.2
Private textile sub-sector	5,659	0.2	619	*	401	0.5
All Manufacturing	2,486,102	100.0	839,122	100.0	82,379	100.0

*Less than one-tenth of one percent.
Source: *Statistical Abstract of Ethiopia*, 1992

Exhibit IV-14. Data on Small-scale Manufacturing Enterprises in Ethiopia, 1986-87

Manufacturing Sector	Enterprises		Employees	
	No.	%	No.	%
Food and beverage	3,884	51.1	1,826	47.2
Textiles	**2,146**	**28.2**	**9,631**	**24.9**
Wood	466	6.1	1,982	5.1
Metals	317	4.2	3,134	8.1
Leather	276	3.6	2,101	5.4
Chemicals	78	1.0	1,313	3.4
Non-metals	88	1.2	1,024	2.6
Paper and printing	38	6.5	513	1.3
Others	307	4.0	711	1.8
Total	7,600	100.0	38,678	100.0

Source: *Profile of the Internal sector in Ethiopia*, Semachew, 1993.

Exhibit IV-15. Data on Cooperative Enterprises in Ethiopia, 1986-87

Category	Enterprises		Members	
	No.	%	No.	%
Tailoring	400	54.3	12,144	36.2
Weaving	260	35.3	16,626	49.5
Others	77	10.4	4,755	14.2
Total	737	100.0	33,525	100.0

Despite the obstacles created by the command economy, small and microenterprises have survived because they have the following attributes:

- They are lean and flexible, adjusting rapidly to constraints and opportunities.

- They are flexible use of local resources when external resources become scarce. They form close links to some public sector textile factories during the command economy.

- They adopt appropriate local technologies and informal trade techniques (which was necessary when foreign exchange was inaccessible to most of them during the command economy). Now, for example, tailoring enterprises in the retail markets of Harar, Dire Dawa, and Addis Ababa obtain quality imported fabrics, improved packaging materials, and stitched foreign brands.

- They create high rates of employment, relative to the amount of capital invested.

There are numerous constraints on private sector development in textile and apparel manufacturing; in many cases, the constraints are more severe for informal enterprises outside the legal framework for business organization. Major constraints include:

- The lack of private property rights adds to risk and instability. This constraint is greater for enterprises that attempt to advance from an informal to a formal business status because increased capital requirements accompany the transition. *This constraint greatly reduces the rate of job creation because most new jobs come from the relatively small portion of little businesses that transition into large ones.*

- The lack of attention given to public sector enterprises depletes the credit and other resources that small private businesses need to succeed. (The cumulative overdrafts of the public sector textile enterprises, given even though they cannot be repaid, could fund many private sector successes.)

- The denial of investment incentives is a major disadvantage faced by small enterprises. The investment proclamation allows local investors tax holidays and free importation of machinery, subject to an investment that exceeds Br 350,000. Many successful businesses could be started for less than that, but comparable incentives would make it more likely that people would try. The arbitrary advantage given to public sector and other large enterprises increases the scarcity and the prices of raw materials available to small private sector businesses, thus squeezing them out of the competition.

F. Export Potential

The public textile sector is currently incapable of consistent competition in global markets; it is unlikely that it could develop and participate in regional African markets. The inability to serve global markets adequately is ensured by an unsuitable product mix, lack of quality controls, managerial inexperience, lack of technical ability and knowledge, and inadequate infrastructure. Recent annual export shipments of textiles and apparel have been tiny; they amount to approximately Br 25 million, divided fairly evenly between the United States and Europe. They appear to be comprised of small orders used primarily to test the suitability of products and fill intermittent, temporary needs. No foreign buyers contacted in the global survey undertaken as part of this study considered Ethiopia to be a primary business partner.

As the 1990 IBERC study of the Ethiopian textile industry pointed out, no country has achieved a globally competitive textile industry within the confines of a public enterprise structure, with the notable exception of the People's Republic of China. Its success is due to (1) a large population that endures high degrees of repression and exploitation without disrupting production; (2) its unique position, both geographic and political, in the Asian theater; and (3) its ability to leverage the political/military priorities of the Soviet Union and the security/economic priorities of the United States. No other country, certainly not Ethiopia, has these unique circumstances.

Two primary reasons were observed for the unsatisfactory situation of Ethiopian textile exports:

- Lack of quality control results in high rejection rates and canceled orders after a few shipments. An integral part of total quality control is consistent, timely production and delivery. The United States is the most advanced in quick response (QR) marketing practices and Electronic Data Interchange (EDI) technologies, but the European market is moving in the same direction.

- Lack of technical expertise results in the lack of coordination by plant managers. Some openly questioned management's understanding of the production capabilities of their plants. They had no confidence that management could accurately estimate the cost of producing an order and the time needed to deliver it.

F1. Markets in the United States and the European Union

Exhibit IV-16 summarizes total fiber consumption in the United States versus the European Union during the 1988-93 period. A comparative examination of the United States and European textile markets reveals that there has been a difference in recent years between the growth rates in total fiber consumption. This was due to a lack of economic growth in Europe, causing a textile recession to persist through 1993. In the U.S. market, a combination of moderate economic growth and declining retail textile prices resulted in significant consumption growth in 1992 and 1993.

Exhibit IV-16. Fiber Consumption in the European Union and the United States, 1988-1993 (Thousand Metric Tons)

		1988	1989	1990	1991	1992	1993
European Union - 12[1]							
Cotton	Amount	1,292.8	1,295.1	1,281.1	1,185.0	1,102.9	1,153.8
	Share	28.1%	27.2%	27.7%	26.0%	24.3%	25.9%
Cellulosic	Amount	408.7	408.6	369.9	338.3	336.1	324.9
	Share	8.9%	8.7%	8.0%	7.4	7.4%	7.3
Synthetic	Amount	2,464.2	2,542.4	2,586.9	2,615.6	2,661.2	2,547.6
	Share	53.6%	54.4%	55.8%	57.3%	58.6%	57.1%
Wool	Amount	431.2	423.9	396.0	424.7	440.8	432.4
	Share	9.3%	8.8%	8.5%	9.3%	9.7%	9.7%
Total		4,596.9	4,670.0	4,634.6	4,563.6	4,541.0	4,458.7
United States[2]							
Cotton	Amount	1,840.4	2,039.2	2,065.1	2,212.7	2,385.9	2,486.7
	Share	31.9%	33.1%	33.8%	35.2%	35.4%	35.3%
Cellulosic	Amount	258.8	230.7	258.7	237.8	237.3	252.8
	Share	4.5%	3.7%	4.2%	3.8%	3. 5%	3.6%
Synthetic	Amount	3,606.3	3,822.1	3,716.5	3,745.2	4,032.9	4,203.9
	Share	63.4%	61.9%	60.8%	59.6%	59.8%	59.7%
Wool	Amount	71.0	75.6	73.9	86.4	88.1	96.2
	Share	1.2%	1.2%	1.2%	1.4%	1.3%	1.4%
Total		5,776.9	6,167.6	6,114.2	6,282.0	6,744.2	7,039.6

[1]Source: Comité International de Rayonne et Fibre Synthétique (CIRFS)
[2]Source: Textile Economics Bureau, *Textile Organon*

Currently, growth in consumption is slow in both global markets. Long-term growth will track with income and population growth; therefore, participation in these markets on a consistent basis will require Ethiopia's textile sector to compete with other global textile suppliers for market share. The sector must offer some combination of higher quality, better service, and lower prices. The industry is clearly unable to do this even within Ethiopian domestic markets. Succeeding in these export markets is substantially more difficult. The same inefficiencies and barriers that make it difficult for imports to penetrate the domestic market (tariffs, customs delays, transportation failures, etc.) also make it difficult for Ethiopian exports to penetrate foreign markets.

Cotton's share of total fiber consumption in the European Union decreased from 28.1 percent in 1988 to 25.9 percent in 1993 (Exhibit IV-16). In the United States, however, it increased from 31.9 percent to 35.3 percent. Therefore, by 1993, cotton's share in the United States was 9.4 percentage points above the share in the European Union.

Exhibit IV-17 provides data on cotton's share in two major end-use categories, apparel and home furnishings. In these two categories, cotton accounts for a minority of the total fibers consumed in apparel and home furnishings within the European Union, but for a majority within the United States. For apparel, cotton's share is 25.3 percentage points higher in the United States than in the European Union. For home furnishings, cotton's share is 21.4 percentage points higher in the United States.

The higher consumption of cotton in the United States is explained partly by greater consumer demand and partly by higher availability and lower relative cost of cotton versus synthetics. The textile industries of developed countries readily adjust the shares of alternative fibers according to their expectations about relative prices of these fibers. The extent of the adjustments made depends on the willingness of consumers to buy alternative fibers, which in turn depends significantly on the relative prices charged for textile products.[3]

F2. The Transitional Phases Involved in Developing a Textile Export Industry

The ability of Ethiopia's textile industry, or that of any country, to compete for a share of export markets follows from its ability to defend its share of domestic markets. Of course, to ready itself for foreign competition, it cannot rely on government-created barriers to competition within its domestic markets. It must be even more fit to survive in export markets than it is to survive in domestic markets. Ethiopia cannot circumvent this natural progression.

The textile industry sparked the industrial age in the United Kingdom and the United States in the late eighteenth and early nineteenth centuries. Textiles and apparel have since been closely associated with industrial development. Nations still look to textiles and apparel for a foothold in industrial development, gravitating toward textiles, clothing, footwear, and leather goods because they are lower order industries that use domestic agricultural sector output.

---

[3]Textile manufacturers will even make minute adjustments within the limits allowed by law for designated fiber blends. For example, a product that is labeled as a blend of 50 percent cotton and 50 percent polyester in the United States may legally vary the share of each fiber up to 3 percentage points. Thus, if cotton is priced significantly less than polyester, it will likely constitute 53 percent of the blend. If cotton prices become high relative to polyester prices, then cotton's exact share will likely decrease to near 47 percent. In the United States, therefore, a swing of 6 percentage points in domestic mill use may occur within a few months, regardless of the situation at the retail level. If relative price changes between fibers are large, it becomes more likely that labeled blend levels will also be altered to give consumers the option of a lower priced textile product. Those consumers with a strong preference for cotton may pay more to get cotton textile products, but those with a somewhat weaker preference may choose to switch to a blend with a lower percentage of cotton.

Of course, retailers of textile products in the United States do not control the minute shifts in fiber shares allowed by the labeling laws. However, they will readily collaborate in adjustments in labeled blends to give consumers the choices they demand. Such adjustments are also readily seen in these retail enterprises' imports of textile products.

Exhibit IV-17. Fiber Consumption by Selected End Uses in the European Union and the United States, 1990-1993 (Thousand Metric Tons)

	Apparel			Home Furnishings		
	Total	**Cotton**	**Cotton's Share**	**Total**	**Cotton**	**Cotton's Share**
European Union - 12[1]						
1990	2,214.3	732.0	33.1 percent	941.9	399.1	42.4 percent
1991	2,136.8	662.1	31.0 percent	931.3	382.3	41.1 percent
1992	2,099.7	596.5	28.4 percent	925.7	366.0	39.5 percent
1993	2,024.7	626.7	31.0 percent	912.7	376.0	41.2 percent
United States[2]						
1990	2,360.3	1,313.9	55.7 percent	1,013.8	601.2	59.3 percent
1991	2,465.1	1,399.9	56.8 percent	1,061.5	654.3	61.6 percent
1992	2,706.8	1,530.7	56.6 percent	1,118.0	699.8	62.6 percent
1993	2,809.1	2,809.1	56.3 percent	1,181.8	740.2	62.6 percent

[1]Source: Comité International de Rayonne et Fibre Synthétique (CIRFS)
[2]Source: Textile Economics Bureau, *Textile Organon*

The natural path of development has been to work from the least capital and technology intensive manufacturing processes into more capital intensive industries as wage rates and the standard of living rise. In textiles, this means beginning with the manufacturing of apparel and other end-use products, a situation which is the reverse of most other products. Most products tend to be less technologically intensive at the raw material or intermediate product stage and become more sophisticated at the finished product stage. Once the knitted, woven, or non-woven fabric is formed and finished, relatively little capital or labor is required to make the final product.

Historically, as domestic apparel industries grow and flourish, capital accumulation is achieved through export sales. Domestic textiles grow by supplying the domestic apparel industry. Other industrial dimensions, such as dyeing and finishing chemicals, man-made fibers, etc., develop as the textile manufacturing industry matures. This path has been successfully negotiated by many Asian leaders in the global textile industry, and is being executed in parts of Latin America and Africa.

The foregoing development process is often referred to as the four product stages of development, which include:

Stage 1. Importation allows technology transfer to take place by allowing new products into the market. In the case of apparel, technology transfer usually comes in the form of adapting foreign designs and products to local tastes and customs.

Stage 2. Import substitution by local manufacturers displaces foreign suppliers with locally adapted, and usually less expensive, products. Money that had gone to buying imported items is spent on raw materials.

Stage 3. Exportation takes place after establishing a local industry that can compete against foreign products in its own market. Local income increases as the industry grows and becomes more sophisticated and competitive. Local producers of inputs begin to emerge, creating opportunities to capture a larger share of the total value that is added in the creation of end products. (Thus, the upstream parts of the industry—the ones making inputs—make the transition into the import substitution stage.)

Stage 4. Re-importation occurs as the input manufacturers enter the exportation phase and begin selling to industries of competing countries, making the domestic industry less important to the nation's economic development. It eventually becomes less important than the industries that grew up to support it.[4]

The foregoing development model contradicts the simplistic "infant industry" policies that are frequently applied by developing countries, including Ethiopia. The "infant industry" doctrine assumes that the prevention of imports helps secure local demand for the product for local suppliers. In the case of textiles, however, this market protection stifles domestic industry by denying it vital inputs, retarding product development capability, and preventing a vigorous infusion of new production methods. When a closed market is combined with a centralized, bureaucratic structure in the domestic industry, the disadvantages are magnified by the lack of management knowledge, marketing skills, and focus on quality control.

Ethiopia has tried to skip the first iteration of the development cycle by becoming a globally competitive manufacturer of intermediate products. The current development priorities of the Ethiopian government are really a reflection of supply-driven characteristics already discussed at length. The intention of current policy is to use the domestic textile industry to consume domestic cotton and to employ domestic labor, rather than emphasizing *what* is to be produced, *for whom* it is to be produced, and *how* it must be done. *The market is intended to serve the industry and its workers, rather than vice versa.* Until this policy viewpoint changes, a competitive textile sector cannot evolve.

[4]*Managing Restructuring in the Textile and Garment Sub-sector*, Economic Development Institute of the World Bank, July 1994.

G. Lessons from Other Countries' Development Experiences

This section presents three case studies: the Republic of Korea, Mauritius, and the Dominican Republic. Each are at different stages of development, but their experiences are strikingly similar. For instance:

- All based their economic development on foreign investment, rather than foreign aid. The governments relinquished currency controls, established stock markets, and allowed for foreign ownership of private property. In all cases, the development was due in great part to *a single investor nation* with strong economic and/or strategic ties to the developing country.

- All domestic government investment was directed toward natural monopolies, such as communications, utilities, and development banks. Some government investment occurred in capital intensive raw material production facilities, such as steel mills. In all cases except Korean banks, however, government investment fell short of government ownership.

- None of the governments owned textile or apparel plants. In all cases, the government granted and upheld their independence, even in those cases where government assistance in the form of direct subsidies or loan credits played a critical role in the businesses' finances.

- All domestic governments made strong commitments to the timely development of transportation and communication networks. The governments did not resist or stifle the use of labor-saving technology by the textile enterprises.

- All governments allowed unfettered access to imported raw materials consumed by export-oriented businesses. Thus, they accepted the fact that domestic suppliers of inputs would have to face greater competition so that the export-oriented industries to have access to needed materials at competitive prices.

G1. Republic of Korea (South Korea)

While the Korean model is in many ways instructive for Ethiopia, some of the key circumstances of the Korean experience will never be replicated by Ethiopia. Korea occupied a unique position in the post-war arena and benefited from global political and trade structures that no longer exist. Especially pertinent are the following:

- As a former Japanese colony and U.S. protectorate, Korea had an internal transportation network built for it. The first railroad was built by the Japanese in 1899 as a defensive response to the Trans-Siberian Railway. As a colony from 1910 to 1945, Korea enjoyed significant infrastructural development, especially during the war years. While much of the industrial base was destroyed during the Korean War, the rail, communications, and air transport facilities were repaired and extensively developed by the United States in establishing defenses following the end of overt hostilities. (North and South Korea have never officially signed a treaty ending the Korean War.)

- Korea was an immediate beneficiary of the textile trade restraints placed on Japan in the 1950's and 1960's. First the Short Term Agreement (STA), then the Long Term

Agreement (LTA), and finally the multi-lateral Multi-Fiber Arrangement (MFA) placed limits on access to the American market by the Japanese and eventually by others (including Korea). As Japan moved first into apparel, then textiles, and finally into man-made fiber production, Japanese businesses invested in off-shore customers of the intermediate products they were beginning to exploit. Faced with quota limitations on apparel exports to the United States, Japan helped to finance Korean apparel manufacturing to lock in customers for its own emerging textile industry. Later, as textile quotas were imposed on them, Japanese investors again allocated funds for Korean mills that would purchase Japanese fibers.

- South Korea played a critical role during the cold war, as a first line of defense and a showcase for market-oriented development. Today, it is often forgotten that South Korea was initially the poorer, more agricultural, of the two Korean economies. It has received more generous treatment in its trade negotiations with the United States than other countries of less strategic importance.[5]

G1a. Background

Over the 30 years since the Park Chung Hee government launched the First Five-Year Economic Development Plan in 1962, the South Korean economy has grown enormously and the economic structure has been radically transformed. South Korea's real gross national product (GNP) expanded by an average of more than 8 percent per year, from US$2.3 billion in 1962 to US$204 billion in 1989. Real per capita annual income grew from US$87 in 1962 to US$4,830 in 1989. The manufacturing sector grew from 14.3 percent of the GNP in 1962 to 30.3 percent in 1987. Commodity trade volume rose from US$480 million in 1962 to a projected US$127.9 billion in 1990. The ratio of domestic savings to GNP grew from 3.3 percent in 1962 to 35.8 percent in 1989.

The most significant factor in rapid industrialization was the adoption of an export-oriented policy in the early 1960's. This strategy was particularly well suited to South Korea at that time. Like Ethiopia today, South Korea of the early 1960's had an extremely poor natural resource base, a low savings rate, and tiny domestic demand base. The strategy was intended to promote economic growth through labor-intensive manufactured exports, in which South Korea could develop a competitive advantage. Government initiatives played an important role in this process. The inflow of foreign capital investment was greatly encouraged to supplement the shortage of domestic savings. These efforts enabled South Korea to achieve rapid growth in exports and subsequent increases in income.

This policy marked a distinct shift from that of Syngman Rhee's government in the 1950's which focused on financing infrastructural development through foreign aid. The dependence on foreign largesse had created a cabal of political favorites who controlled much of the wealth these investment programs were generating. The resulting efforts to control the distribution of wealth constrained growth. In fact, the Park government came to power as a result of a military coup in response to wide-spread political and financial corruption.

[5] Even into the 1980's, the U.S. State Department designated Korea as a "special case" during textile trade negotiations.

South Korea did benefit greatly from U.S. foreign aid which went to build an infrastructure, including a nationwide network of primary and secondary schools, modern roads, and a modern communications network. By 1961, South Korea had a well-educated young work force and a modern infrastructure that provided the Park government with a solid foundation for economic growth.[6]

The Park administration decided that the central government must play a key role in economic development because no other South Korean institution had the capacity or resources to direct such drastic change in a short time. The resulting economic system incorporated elements of both state capitalism and free enterprise. The economy was dominated by a group of "chaebol," large private conglomerates (to be discussed at length later), and by a significant number of public corporations in areas such as iron and steel, utilities, communications, and other heavy industries. The government guided private industry through a series of export and production targets using the control of credit, informal means of pressure and persuasion, and traditional monetary and fiscal policies.

Park extended government control over business by nationalizing the banks and merging the agricultural cooperative movement with the agricultural bank. The government's direct control over all institutional credit further extended Park's command over the business community. The Economic Planning Board was created in 1961 and became the nerve center of Park's plan to promote economic development. Beginning in the 1960's, the board allocated resources, directed the flow of credit, and formulated all of South Korea's economic plans.

Park's first major goal was to establish a self-reliant industrial economy independent of massive waves of U.S. aid. Significant economic policies included strengthening key industries, increasing employment, and developing more effective management systems. A major government objective was to increase the level of exports significantly. This had to be achieved by stressing greater international competitiveness and higher productivity because of South Korea's dependence on foreign sources of raw materials, especially oil, whose price rose dramatically through the 1960's and 1970's.

The government successfully combined a policy of import substitution with the export-led approach. New industries were nurtured by making the importation of some goods difficult but making the importation of raw materials very easy. "*When the new industry was on its feet*, the government worked to create good conditions for its export."[7] Incentives for exports included a reduction of corporate and private income taxes for exporters, tariff exemptions for raw materials imported for export production, business tax exemptions, and accelerated depreciation allowances. It should be noted that South Korea did not attempt to thrust businesses that were not ready for export into global markets in which they could not compete.

[6]In contrast to this situation, both past and present Ethiopian governments have retarded the development of a technologically advanced telecommunications infrastructure. Current limitations on the importation of personal computers and fax machines, the government monopoly on telephone equipment, and the recent decision to prevent the development of satellite communications all work in this direction. Without modern means to collect and disseminate information quickly and cost-effectively, Ethiopia will never be able to develop the information intensive management systems needed to compete in the 21st century.

[7]Quoted from a U.S. Army Briefing Paper on the Korean Peninsula, 1994.

G1b. Financial Development

A critical problem in South Korea was raising funds to foster needed industrial development. Domestic savings were very low, and due to the devastation of the war, there was little available domestic capital. These obstacles were overcome—without resorting to creating industries through foreign aid—by enabling foreign loans, attractive domestic interest rates, and tax incentives for saving. To realize its growth targets while maintaining domestic sovereignty, it was decided to achieve a gross domestic savings rate that exceeded the domestic investment rate. Only then could the financing of future economic growth come entirely from domestic sources. The most recent plan calls for reducing foreign debt by US$2 billion a year so that South Korea would become a net creditor nation by the mid-1990's. Through the promotion and reform of the securities markets, especially the stock market, the government encouraged the diversification of sources and types of corporate finance, especially equity finance. Because of the introduction of tax and financing incentives by the government that encouraged companies to list their shares on the stock market, the Korean Stock Exchange grew rapidly.

Domestic savings were very low before the mid-1960's, equivalent to less than 2 percent of GNP in the 1960-62 period. The savings rate jumped to 10 percent between 1970 and 1972, due in large part to banks offering depositors rates of 20 percent or more on savings accounts. The savings rate increased to 16.8 percent of GNP in 1975 and 28 percent in 1979. In 1980, due to a precipitous rise in oil prices, the savings rate dropped to 20.8 percent in 1980. After 1980, as incomes rose, the savings rate recovered and reached new heights—36.3 percent in 1987 and 35.8 percent in 1989.

Business financing was obtained primarily through bank loans or borrowing on the informal and high-interest curb market of private lenders. The curb market served individuals who needed cash urgently, less reputable business people who engaged in speculation, and the multitudes of smaller companies that needed operating funds but could not procure bank financing. The loans they received, often in exchange for weak collateral, had very high interest rates. The curb market played a critical role in the 1960's and 1970's, pumping money into the economy and assisting the growth of smaller corporations.

The Economic Planning Board established export targets that, if met, yielded additional government-subsidized credit and further access to the growing domestic market. Failure to meet such targets led to Seoul's withdrawal of credit.[8]

The share of government spending devoted to investment and other capital formation activities increased steadily through the first and second five-year plans (1962-1971), peaking at more than 41 percent of the budget in 1969. The economic development was further leveraged by a dramatic build-up of foreign debt, totaling US$46.8 billion in 1985 and making South Korea the fourth largest third world debtor. Further leverage came from huge corporate investments, which were primarily of Japanese origin.

---

[8]This contrasts current Ethiopian policy, which extends unsecured credit without any improvement in the quality or profitability of the factories. The Korean banks offered no second chances. Failure meant closure, not more loans.

G1c. The Chaebol

Immediately following the Korean War, foreign aid became the most important source of funds for the reconstruction and rehabilitation of the economy. Most of the surviving Japanese-built industrial facilities were turned over to private owners, removing them from the public sector. During this highly transitional period, a group of entrepreneurs began companies that later became the chaebol, or business conglomerates. The chaebol were groups of specialized companies with interrelated management. These groupings of affiliated companies became quite dominant in South Korea's economy by the late 1980's. They included businesses involved in heavy machinery and equipment, consumer goods, electric and electronic goods, trading companies, and real estate and insurance concerns.

Thus, the major industries on which the export-oriented development policies were based were in private hands from the outset. The chaebol were powerful independent entities acting in the economy and politics, but they sometimes cooperated with the government in the areas of planning and innovation. It is noteworthy that the government worked hard to encourage competition among the chaebol in certain areas and avoid total monopolies.

The ability of the chaebol to grow was fostered by domestic and foreign loans, special favors, and access to foreign technology. Under the guise of guided capitalism, the government selected companies to undertake projects and channeled funds from foreign loans. Furthermore, the government guaranteed repayment to the foreign lenders should a company be unable to repay its loans. Additional loans were made available from domestic banks, often with a focus on assisting with access to foreign technology. *Rather than having to develop new areas through research and technology, South Korean firms were enabled to purchase foreign patents and technology, then produce the same goods made elsewhere at lower costs.* This policy revealed an aggressive acceptance of the importance of intellectual property rights that currently does not exist in Ethiopia.

G1d. The Role of Public Enterprise

A government-led economic development policy during the 1960's was necessary because less experienced and capital-poor private entrepreneurs lacked the wherewithal to develop several critical industries necessary to the nation's economic growth. The Park government determined that establishing public corporations to develop and manage these highly strategic industries was the optimum alternative for fostering growth in key areas. During the 1960's, public enterprises were concentrated in electrification, banking, communications, and other so-called natural monopolies.[9]

G1e. Textiles and Footwear

Textiles, clothing, and leather products made up about 24 percent of South Korea's manufacturing output in 1980. Textiles have played a critical role in Seoul's exports over the years, accounting for US$11.9 billion, or 19.6 percent of total export earnings. In 1989, the export of textiles (valued at US$15,340 million) grew 8.5 percent over the 1988 level. Although a major contributor to the success of Korea's export-orient development, *no textile mill or*

[9]It should be noted that the concept of natural monopolies, which has been questioned by modern economic thought for some time, is now being undone by the globalization of national economies.

apparel plant was ever publicly held or managed. Nor were textile enterprises ever within the chaebol network. In fact, one of the hallmarks of South Korea's textile industry is the central role played by small private enterprises. In 1978, for example, over 10,000 textile and footwear enterprises employed more than four workers each, while 34,000 smaller shops also manufactured such products.

Now, in fact, the textile industry in South Korea is beginning to play the role internationally that Japan once played for it. Textile manufacturers, concerned about diminishing export competitiveness because of wage increases and won revaluation, have expanded their overseas investments. Most of these investments are located in the Caribbean Basin region and Southeast Asia. Upgrading product lines—particularly toward high fashion—and further shifting to the expanding domestic market are helping South Korea move into the re-import phase in textiles, apparel, and footwear.

G2. Mauritius

As in the case of Korea, the parallels that can be drawn between Mauritius and Ethiopia are limited. Mauritius was formerly a colony under three different European nations. It has strong legal, economic, and cultural ties to the European Union. In fact, as a member of the British Commonwealth, Mauritius enjoyed favored access to other markets as well.

As a small island nation in the Indian Ocean, Mauritius was heavily dependent on trade long before European colonization. In addition, due in large part to transplantation of foreign populations during the French and British occupations, Mauritius has an extremely polyglot population with ethnic ties throughout the third world. (This contrasts with Ethiopia, which has an almost isolationist sense of independence.)

Mauritius is also unusual among African nations in that it never embraced socialism, even within a democratic context. Thus, it has a well-established legal tradition of private property rights. Nor have there ever been any state-owned enterprises to divest or bureaucracies to dismantle.

Mauritius is disadvantaged by (1) limited natural resources, (2) a tiny capital base, and (3) a dense population. It has had to build its development on labor intensive, low technology industry. Currently, agriculture accounts for only 10 percent of the GDP of Mauritius (compared to 85 percent for Ethiopia).

G2a. Background

Mauritius has a long association with the European market. It was discovered by the Dutch in 1598 and colonized by them in 1638. Dutch interest in Mauritius was limited to its strategic location along the trade routes around the Horn of Africa; it was not itself a trading partner. As a result, the Dutch never established a strong vested interest in the colony and offered no resistance to a take-over by the French in the late seventeenth century.

The French maintained Mauritius as a sugar plantation by importing Creole labor. Although French authority was usurped in Britain in 1834, Mauritius has maintained much of its French culture and heritage. English is the official language and is taught in the schools, but Creole is the most commonly spoken language. French remains the language of business. Most Mauritians speak all three languages.

The British occupation was the most enduring, lasting well over a century. Mauritius obtained Commonwealth states in 1948 and became independent in 1968. Its current form of government is a constitutional republic which has been in place only since 1992. The British Privy Council continues to function as the nation's supreme court, but Mauritius maintains strong legal traditions within the Napoleonic Code.

Its geographic position and colonial history have together ensured that Mauritius is extremely dependent on trade. Exports account for 64 percent of GDP, about triple the level of other countries of similar size and development. Unlike most African nations, manufactured goods account for the most exports; principal among these are textiles and finished apparel.

G2b. Financial Development

As with Korea, Mauritius depended very heavily on foreign investment to finance economic development. Mauritius was quick to establish a stock exchange after its independence, both to attract foreign investment and to provide a venue for local savings. It a Commonwealth member, so the Mauritius rupee has always been freely exchanged. As of 1991, private investment accounted for 28 percent of GDP, putting Mauritius slightly above the average for developing economies. Unlike other developing nations, Mauritius does not suffer from a negative savings rate. In fact, consumption's share of GDP, at 65 percent, is similar to that of the United States.

An open trade policy, discussed below, has helped to contain domestic inflation to an average of 8.1 percent during 1980-1992. This is well below the inflation rate of most countries in Africa and the Indian Ocean over the same period. The reason is attributed to fiscally conservative government spending and maintenance of a balanced budget. This relative price stability has made Mauritius more attractive than other countries as an investment opportunity.

The government of Mauritius has aggressively adopted policies that will support an expanding financial services industry, sufficient not only to accommodate its own trade growth, but to provide regional financial services as well. Therefore, the import substitution phase of development, discussed in section F2, is being achieved in trade and financial services, not just in manufactured products.

G2c. Infrastructure Investment

Despite low government spending Mauritius has a literacy rate of 85 percent, slightly above the African average. Primary school enrollment is 100 percent, and secondary enrollment is 52 percent.

One of the primary reasons for Mauritius' success is its well-developed telecommunications structure. The telecommunications industry is state owned; nevertheless, access to it is not restricted and major investment has been made in new technology. It is rated as one of the most advanced among developing nations.

G2d. Trade Policy

To support a vital export-oriented manufacturing base, the government of Mauritius has ensured that domestic businesses have competitive access to imports, through maintenance of an extremely open trade policy. The result has been for the terms of trade to move slowly in

Mauritius' favor over the last decade, allowing Mauritius to achieve an average annual GDP growth rate of 6.7 percent and an average per capita income growth of 6.1 percent.

Industrial development has so far been the dominant source of economic expansion. Manufacturing output expanded at a rate of 11.2 percent per annum during 1980-1991, while the service sector expanded by 5.8 percent per annum. As would be expected, Mauritius' principal trading partners are the United Kingdom and France. The role that these two nations have played for Mauritius is similar to the one that Japan has played for Korea. By serving as a cut-and-sew center of British and French garment manufacturers, Mauritius has been able to create a viable garment industry without foreign aid and very little foreign debt.

Ethiopia should note two critically important characteristics of Mauritius' development process in garment manufacturing. They are:

- Mauritian garment facilities were financed through foreign investment by policies that established an investor friendly environment. This approach requires the existence of property rights and a freely convertible currency.
- Mauritius has succeeded in exporting by accommodating importing. The garment industry was grown for its own sake, not to serve domestic textile capacity. By allowing freedom to obtain inputs from all sources available, the garment industry was enabled to produce competitive products.

G3. The Dominican Republic

The Dominican Republic has several characteristics similar to Ethiopia, including (1) a 30-year history of state involvement in industries that are now in the throes of extensive privatization, (2) exports that were heavily dependent on cash crops such as sugar and tobacco, and (3) the advantage of cheap labor to drive industrial development. But unlike Ethiopia, the Dominican Republic has focused on removing or alleviating the structural impediments to industrial development.

Recognizing that a reduction in direct government involvement in industry will result in substantial worker displacement, the Governor of the Central Bank of the Dominican Republic recently wrote, "In winning the race for progress the national authorities know that there is no universal formula that assures the sustained development of everyone. But to deny the necessary changes, with the framework of a world on the way to integration, would be to prolong the inefficiencies that are contained within the economy and to run the risk of isolating us from international markets."[10]

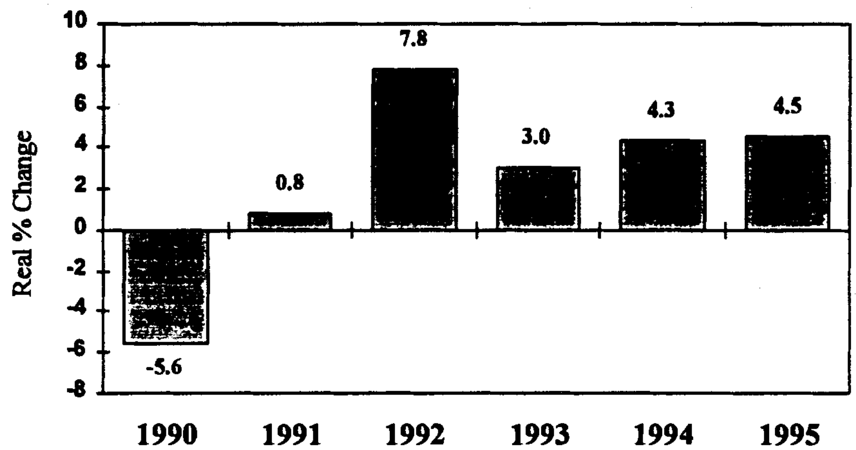
In 1991, the Dominican government announced a series of reforms to enhance the competitiveness of the Dominican economy through liberalized trade and investment and reduced government ownership in key industries. As for both Korea and Mauritius, the shift from reliance on foreign government aid to foreign business investment has also been a critical ingredient in the Dominican Republic's economic development. In fact, for the Dominican Republic, the benefits of liberalization outweighed costs even in the short term. The balance of payments, overall, went from a deficit of US$380.3 million in 1991 to a surplus of US$469 million in 1994. While total

[10] *The Dominican Republic, 1995: An Investor's Guide,* Santo Domingo News.

foreign debt for all of Latin America has climbed 17 percent over the last five years, the Dominican Republic has reduced its debt by 15 percent. In total, it has reduced its total foreign debt by US$692 million since 1991; in 1994, it was the only Caribbean country to reduce its debt.

This debt servicing is even more impressive when seen as a percent of Gross Domestic Product (GDP). After posting a sharp drop in GDP for 1990, the Dominican economy has outperformed the rest of the world in every year since 1991. Per capita GDP growth has increased an average of 4.9 percent during 1992-95 (Exhibit IV-18). The 4.5 percent growth rate reported for 1995 was achieved despite that year having the worst hurricane season in recent memory.

Exhibit IV-18. GDP Growth Rates in the Dominican Republic



As a result of strong economic growth and increased government fiscal discipline, foreign debt as a percent of GDP has fallen from 59 percent in 1991 to 37 percent in 1994. Furthermore, it is estimated to have fallen to near 30 percent in 1995.

G3a. Structural Reform

In its annual report to the Americas Society, the Central Bank of the Dominican Republic reported that "Dominican authorities and the business community are aware that in order to face the challenges and take advantage of the opportunities that the 'new international order' represents, great institutional changes are needed. *Globalization* is the frame of reference that is required *if the economy is to function.*" To achieve this goal, "structural reforms were implemented with the purpose of modernizing the economy and basic institutions in order to secure insertion in today's competitive world." Thus, the Dominican Republic has concluded that it is not possible to reform the business environment without first reforming the structure and institutions within which those businesses must function.

Those structural reforms focused on four core areas:

- Improving the country's capacity to attract and hold investment

- Stimulating the manufacturing sector's international competitiveness
- Making more transparent the functionality of democracy and the rule of law
- Increasing efficiency of supporting infrastructures through assured competition and independent regulation.

G3b. Investment Reform

To "adapt its [financial] institutions to the challenges of an increasingly open and competitive international economy," the Dominican Congress (the national assembly of the Dominican Republic) enacted the Foreign Investment Law of 1992 based on the principle of equal treatment of foreign and domestic investors as well as equality of obligations and rights.

G3c. Legal Reform

Specific reforms include:

- Removing restrictions on foreign investment participation in certain areas of the economy. (Note: The law still requires that 51 percent of an enterprise be held by a Dominican national or a permanent resident of the Dominican Republic.)
- Granting equal jurisdictional treatment to all investors in accordance with international legal norms.
- Harmonizing the criteria for the registration of technology transfer with existing international regulations.
- Clearly defining regulations for foreign investors (i.e., protecting foreign investors from arbitrary actions by the government).
- Permitting the infusion of intangible technology ("know-how"), i.e., allowing the placement of foreign nationals in key managerial positions in Dominican enterprises.
- Simplifying procedures for the placement of freely exchangeable currency at an authorized banking entity in preparation for floating the Dominican dollar.

In drafting this legislation, the Dominican government solicited the advice of the Interamerican Investment Corporation, a subsidiary of the Interamerican Development Bank, and the Association of Foreign Investment Companies (ASIEX).

These structural and institutional reforms allowed foreign investors to participate in security markets; acquiring shares, bonds, and other negotiable instruments without risk of arbitrary government actions and without having to create a local presence. These allowances greatly reduced the nonpecuniary costs of investment, helping to increase foreign investment dramatically, while simultaneously reducing the prime interest rate from 49 percent to 24.2 percent and reducing the interest paid on deposits from 18.4 percent to 10.7 percent.

G3d. Competitiveness and Infrastructure Reform

A central component of plans to enable a competitive industrial base has been the creation of 26 industrial zones, which allow for the timely and duty-free importation and re-export of products that have been transformed by domestic labor. Through these zones, the Dominican Republic has become the fifth largest foreign supplier of garments to the United States and ranks first in six garment sub-categories. U.S. textile companies with major operations in them include the Johnson & Johnson Corporation and the Hanes Corporation. Other types of companies with major operations there include the Westinghouse Corporation (doing product assembly) and the American Airlines Corporation (with a major data processing center).

Enabling success of these free trade zones required more than just expediting the shipment of raw materials. Important regulatory changes included the following:

- Tariff barriers were greatly reduced and standardized for all products, not just those intended for re-export.
- Tariff schedules were modified to ensure uniformity among all of the laws and rates. The new rates ranged from a minimum of 3 percent to a maximum of 35 percent, with an aggregate effective tariff rate of 16 percent.
- Simplified procedures were developed in many areas that facilitated foreign-based business operations; e.g., re-training of workers, automating port-of-entry operations, and, very important, reducing paperwork.

Another critically important step taken was passage of a new Labor Code which "modernized management-labor relations," shifting government policy from one of advocating labor rights to functioning as an honest broker of management-labor disputes. It also enabled putting the total costs of labor (the combined direct labor costs and indirect social costs) into parity with the international marketplace.[11]

More strategically, in 1993, a ten-year Plan for Education was established. Its aim is to advance basic education, increase the literacy rate (currently at only 73 percent), and expedite the evolution of new job skills. This is an infrastructure issue.

Undergirding the foregoing changes were other basic changes relating to infrastructure; most of them were aimed at increasing the productivity and international competitiveness of support sectors such as transportation, communication, and electrical power. The Dominican Republic introduced an "open skies" policy with respect to air transportation and is privatizing all major port services. It has opened the contract process for telecommunications and today has a state-of-the-art microwave telecommunication system. The Dominican Republic Congress is currently debating a General Energy Act, intended to initiate the privatization of the state-owned Dominican Electric Corporation; already, a significant share of the nation's electric grid is supplied through private sector contracts.

[11]Ethiopian leadership must come to terms with the fact that current labor regulations discourage foreign investment and that labor relations in the public sector makes the situation almost impossible to manage.

H. The Issue of Free Trade Zones in Ethiopia

The use of free trade zones has been considered by many Ethiopians who desire that the country find a way to enter into international competition. It is thought to be most relevant for garment manufacturing enterprises. Certainly garment manufacturing offers a superior alternative to textile manufacturing as a major employer of low-skilled workers.

Given the closed and highly regulated nature of the Ethiopian economy, the creative use of free trade zones for garments and textiles may be the only way to enable the necessary foreign investment and competitive performance in the foreseeable future. To have a chance for success, however, the following points must be addressed:

- Foreign capital will not be invested in free trade zone factories as long as it appears that the same public enterprises responsible for the problems that now exist have any control over private sector production and marketing decisions.

- Foreign investors will require either outright ownership of property or a long-term arrangement that imparts complete control of the property to them. To create a free trade zone, the Ethiopian government should expect to create a separate set of property rights that apply to them.

- Besides secure property rights, foreign investors will be looking for unfettered access to foreign currency and free exchange of currencies; unrestricted access to foreign suppliers of inputs such as fabric, dyes, yarn, and sundries; a cooperative government bureaucracy; a highly functional telecommunications system; employment regulations that do not usurp the right to hire and fire workers or the right to recruit necessary management and technical expertise; and an overall regulatory environment that allows the flexibility to maintain competitiveness.

I. Conclusions and Recommendations

While significant changes have occurred in the Ethiopian economy during the last five years, most have not been at the structural level. Rather, an attempt has been made to regulate the conduct of economic sectors without altering the structure within which these sectors must function. Consumer access to textile products has increased, and the consumer market is dominated by small, unregulated businesses. But the production segment remains publicly held and highly regulated. This combination results in (1) a retail environment that provides diverse alternatives to Ethiopian consumers, but (2) a textile manufacturing sector that is ill-equipped to understand and respond to the competition for consumers' textile expenditures.

The requirements for successful free trade zones have been unacceptable to the Ethiopian government, which was chosen to pursue other approaches. Thus, a 1992 study by Werner International suggested the possibility of establishing five state-financed garment factories to serve as customers of the public sector fabric mills. One was built, the Nazareth Garment Factory, which is now bankrupt. The failure of this experiment suggests that developing an open-market industry with the express purpose of providing an outlet for a supplier, rather than serving as a market, is impossible. A viable garment industry cannot be established if it is required to serve Ethiopia's yarn and fabric manufacturers.

To perpetuate the industries now represented by the public textile sector, the market must be made subservient to the industry. This is clearly impossible with respect to export markets. It could possibly be done in domestic markets, but only at the price of impoverishing millions of consumers for the sake of thousands of producers. Furthermore, taking this approach necessarily precludes the development of a globally competitive textile industry in Ethiopia.

Does the People's Republic of China offer an alternative for successful exportation to world markets while controlling resources and revenues made by business enterprises? Possibly, but only if production capability is huge, and the workers are willing to accept bare subsistence. The people of any country are consumers as well as producers. The Chinese approach denies domestic consumers basic choices and threatens the stability of their labor force, both of which make for an untenable situation. In any case, Ethiopia does not have the capability China does to leverage itself into global trading channels.

Some in the Ethiopian government and public sector bureaucracies insist there must be a third way to enable public sector enterprises to be "efficient, productive, and profitable," as specified in Public Enterprise Proclamation No. 25/1992. This implies that public sector enterprises can behave as if they had to be profitable to survive, as if they had to respond to market demands, and as if satisfying customers were fundamentally important. To prove this, they must explain why public sector structural incentives are consistent with the conduct that must be evidenced to get the performance (i.e., efficiency, productivity, and profitability) desired. There is no evidence to support their assertion.

Additional structural changes must be undertaken first. There cannot be tactical solutions for strategic problems. Unless the structural disincentives to improved economic performance are alleviated, fine-tuned tactics will be useless. In the structural area, we recommend the following:

- Undertake a systematic examination of how public sector textile enterprises stand with regard to legal criteria (as indicated in the Public Enterprise Proclamation No. 25/1992) for viability. For those that are not viable, establish a plan for dissolution or down-sizing that meets necessary social obligations to workers. For those enterprises determined to be viable, establish what the governments's obligation to them is if they continue to be viable or if they cease to meet the criteria for viability. This should include stated plans for meeting necessary social obligations to workers. This approach will establish the structure on top of the legal foundation that appears to have been laid. If this is not politically feasible, then the legal foundations of public sector enterprises should be restructured.

- Undertake a systematic examination of the trade-offs necessary in the nation's laws, regulations, and institutions, to enable Ethiopia to become a substantial producer of cotton. This includes (1) giving cotton growers the right to prevent livestock grazing versus allowing cattle owners full grazing rights, (2) preventing government interference in sales decisions as opposed to having dictatorial powers over buying and selling, and (3) allowing the market to set prices for cotton versus imposing them artificially. If resolving such trade-offs is infeasible or unacceptable, then policies and programs must focus on accommodating the raw fiber needs of the domestic textile sector through imports.

- Undertake a systematic examination of the trade-offs necessary in the nation's laws, regulations, and institutions, to make Ethiopia competitive for private, foreign investment in textile manufacturing activities. Carry the conclusions reached from this examination to the highest levels of government. These trade-offs include (1) eliminating currency controls versus artificially setting them above or below market values, (2) passing pro-business labor laws to enable job creation and elimination versus keeping laws that prevent job elimination and discourage job creation, (3) allowing regional labor mobility versus controlling labor migration and industry location. If resolving such trade-offs is not acceptable, then this avenue to establishing a viable textile sector should be abandoned.

- An alternative to enabling a competitive textile industry is to enable an exclusively export-oriented textile industry. This will almost certainly involve free trade zones and a focus on a garment export industry. Undertake a systematic examination of the trade-offs necessary in the nation's laws, regulations, and institutions that would enable this. These trade-offs include (1) allowing more liberal property rights within free-trade zones versus maintaining restrictive property rights throughout, (2) allowing more liberal labor laws within free-trade zones versus maintaining restrictive labor laws throughout, and (3) requiring the Customs Service to be a speedy enforcer of trade regulations versus allowing it to arbitrate socially responsible trading. If these issues cannot be resolved in favor of facilitating trade, this avenue of development should also be abandoned.

- Undertake a systematic examination of infrastructure requirements (including energy, transportation, communication) and set priorities for Ethiopia during the next decade or so. Examine the implications of these priorities for textile and garment manufacturing and for the feasibility of further development in textiles and garments. (Infrastructural constraints will limit the development of yarn and fabric manufacturing much more than they will the development of garment manufacturing.) Incorporate these implications into plans relating to textiles.

- Give special consideration to communications in general and to telecommunications in particular because these abilities are increasingly critical for functioning in globalized textiles markets. Only after the textile industry has the ability to communicate quickly and continually with suppliers and customers will it benefit from the managerial capacity to analyze, internalize, and respond to available market information. Maintaining a monopoly over the country's communication system is incompatible with competition in a global market. Emerging communication technologies make it increasingly difficult to argue that a natural monopoly is possible in telecommunications.

- Establish a task force (consisting of public and private enterprises, government agencies, and trade associations) to set priorities on market data and information needed by textile (and other) businesses in Ethiopia. Governments of countries with advanced economic monitoring capabilities could assist with this undertaking, which should lead to the development of an information gathering and disseminating system appropriate for Ethiopia. Projects such as this have been funded by USAID in several developing countries and have been assisted by the International Statistical Program Center (ISPC) in the U.S. Bureau of the Census.

- Undertake a process to establish straightforward copyright protection laws sufficient to ensure that designs and product constructions cannot be copied by other businesses. In textiles and apparel, and in most other product manufacturing industries, this is necessary to make it worthwhile to invest in and take the risks entailed by product innovation.

- Undertake a systematic examination of policy and regulatory changes that would enable the rationalization of domestic and foreign sourcing of textile fibers, yarns, and fabrics. If some textile enterprises find ways to pay for these inputs legitimately, they will need flexibility in sourcing them. Investors considering the establishment of new textile factories will require this flexibility.

- Undertake a systematic examination of policy and regulatory changes that would rationalize the imports of salvage clothing and enable the entry of this supply segment into the legal market, thereby minimizing the underground market. The key is a workable balance between reasonable tariffs and aggressive enforcement of import laws. If legitimate businesses are enabled to compete effectively with illegitimate ones, then effective enforcement can ensure that the legal market dominates and the government collects the tariffs and taxes generated by it.

Convincing movement by the government on the foregoing structural issues will enable movement in other initiatives to improve the conduct and performance of the textile sector. After actions on these structural issues are clearly under way, the following recommendations apply:

- In preparation for making each enterprise responsible for its survival, undertake a systematic examination of each enterprise's debt situation, determine how much of its debt will be forgiven and taken over by the government, and remove the liability from the financial statements.

- Involve a task force (which may include selected representatives from management and boards) in the task of deciding how to assist public cotton/textile sector managers in meeting the challenges of the open market and in making the necessary changes in organizational structure and employment. At this juncture, the need to confront the realities of unproductive capital equipment and excess labor will be unavoidable. Downsizing and privatization will appear as more attractive alternatives. Alternatives for getting and empowering management expertise in technical and marketing areas will become the focus for those enterprises that are viable.

- For each enterprise with a stable management team, obtain assistance to help it undertake a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis of the enterprise to determine which niche(s) can be targeted in the marketplace. This will take weeks to accomplish under expert guidance. It should yield a conclusion on the enterprise's market segment(s) and a mission statement on how each segment will be served.

- Following the execution of the SWOT analysis, each enterprise should establish a marketing strategy and make a plan of action for executing it which includes a detailed budget. Active marketing costs money, but changing the passive marketing behavior that permeates the public sector textile industry is a necessary condition for future viability.

- Include in the processes of analysis and planning for each enterprise the opportunity to consider cooperation with other enterprises to achieve mutual objectives. To the extent possible, cooperation with existing or potential private sector enterprises should be emphasized. Survivors will almost certainly be out-sourced to small private enterprises for repairs and maintenance, inputs, etc. Small private enterprises could result from the down-sizing or dissolution of some public sector enterprises. Every effort should be made to help them work with the public sector.

- Assist in the identification and funding of education and training programs in technical, marketing, and management areas. These should be extended to public and private sector personnel; the distinction between them in cotton, textile, and apparel enterprises should become increasingly unimportant over the next few years.

SECTION V

EVALUATION OF PUBLIC COTTON SECTOR

SECTION V
EVALUATION OF PUBLIC COTTON SECTOR

The purpose of this section is to (1) assess the status of state enterprise farms, (2) recommend changes to improve their operational efficiency, and (3) identify structural adjustments needed to enhance their performance. In conducting the study, data and review materials were collected from several sources, including the U.S. Agency for International Development, the Textile Sector Task Force under the Public Enterprise Supervising Authority (PESA), and the state enterprise farms examined. Visits were also made to two enterprises, six enterprise farms, three ginneries (one privately owned), and one textile plant. An effort was made to visit private farms, but no visits were arranged.

Recommended background reading is Appendix III, Cotton Growing Report, of the Ethiopian Cotton Sector Assessment by Cargill Technical Services, Inc. The report gives an overview of the production sector without focusing on state enterprises, and describes the extent to which the privatization of state farms has been accomplished to date.[1]

Another item worth noting is that the data reported here on cotton quantities are based on *lint cotton* (after the seed and waste matter have been removed by ginning), the international standard for reporting on cotton quantities. Ethiopian data are sometimes reported in units of *seed cotton*, which includes the seed, waste, and lint weight combined (before ginning). In the data reported here, conversions have been made using the following relationship:

$$\text{weight of lint cotton} = 0.35 \text{ (weight of seed cotton)}$$

Section III of this report provides an overview of the country's cotton sector, including comparisons between the entire sector and state enterprise farms. A summary of the four Agriculture Development Enterprises (North Omo, Middle Awash, Tendaho, and Abobo) follows. The report then presents conclusions and recommendations for changes in state enterprise operations. Separate descriptions and analyses of the four enterprises are presented in Annexes C, D, E, and F.

A. Overview of the State Enterprise Farm Sector

A1. Cotton Production

Cotton is produced in Ethiopia through three vehicles: state owned and operated farms (the state enterprise farm system), private commercial farms, and peasant farms (Cargill). Cotton produced on the state farms and private commercial farms is used in commercial textile

[1]The Cargill report will provide a broader context for this report. However, there are some differences between the reports in terms of data used and consequently in some of the estimates. For example, land area in cotton and total cotton production are smaller in this report than in the Cargill report. This report uses the area and production data published by the International Cotton Advisory Committee (ICAC), while Cargill's estimates were derived from information provided by individuals within Ethiopia. While the Cargill report provides a perspective on the cotton sector, this report provides greater detail on state enterprise farms. For more on the technical aspects of producing cotton, see the symposium proceedings edited by Abeba (see the list of references at the end of this section). The papers from that symposium are somewhat dated (1982), but some information on the production system is useful.

manufacturing, while that produced on peasant farms may enter the commercial market or the hand loom industry (in-home production through hand spinning and weaving). It is uncertain how much cotton is produced by peasant farms and how much cotton the hand loom industry consumes. Differences in these estimates may partially explain the differences in production estimated by the International Cotton Advisory Committee (ICAC) and Cargill. The ICAC has reported that production has averaged around 14,000 metric tons in recent years (Exhibit V-1). This may exclude some cotton produced by the peasant farm sector; data on that sector are practically impossible to obtain.

Exhibit V-1 shows that state farm enterprises comprise about 38 percent of the land area planted to cotton in Ethiopia and produce about 50 percent of the country's cotton. Yields are 31 percent above the national average. Resources in state enterprise cotton production are therefore important to the fiber sector of the country. Data are not available to disaggregate the remainder of Ethiopia's land area and production between private commercial farms and peasant farms. However, Cargill estimated the 1993-1994 production of private commercial farms at 3,898 metric tons of lint cotton on 8,530 ha of land. This yields an average of 456 kg lint/ha, which is slightly above the average for the state enterprise farms. Furthermore, partial information on a few private farms suggests that yields on private commercial farms may be even higher than the Cargill estimate.

If Cargill's estimates of areas and production are representative of the private commercial sector, then about 16,800 ha and 2,911 tons of cotton were produced on peasant farms (with an implied yield of 173 kg lint/ha). These rough estimates suggest that 29 percent of production was from private commercial farms and 21 percent was from peasant farms. If state farms were converted to private commercial farms, cotton production levels would be maintained or slightly increase (unless, of course, farmers chose to produce crops other than cotton). On the one hand, conversion to peasant farms would substantially decrease cotton production.

A2. Cotton Marketing and Pricing

Existing flows of cotton and marketing channels in Ethiopia are illustrated in Exhibit V-2. State enterprise farms gin exclusively with their respective enterprise ginneries, which are under the same management. Cotton is priced from a price schedule, occurring at pricing point D in Exhibit V-2. Representatives of enterprise farms and textile plants negotiate the price schedule annually—sometimes by the time the crop is planted, but sometimes not until June or July of a crop year. Exhibit V-3 presents the price schedule used for the 1995 crop, and shows a substantial price increase from the previous year. These prices and price differentials based on quality result from negotiations between representatives of the enterprise farms and the textile plants (pricing point D in Exhibit V-2). Price differences based on quality exist, but they are small; the difference between the highest and lowest prices in Exhibit V-3 is only 13 percent.

Private commercial farms have three channels available for marketing cotton. They can sell seed cotton to a merchant, in which case a price is established at point A in Exhibit V-2. In this case, the merchant may have the cotton ginned at private or enterprise gins.

Exhibit V-1. Cotton Production in Ethiopia and the State Enterprise Farms, 1992/93-1994/95

Year	Ethiopia[1]	Enterprises[2]				
		Middle Awash	North Omo	Tendaho	Abobo	TOTAL
1992/93						
Area (ha)	40,000	4,953	2,859	5,078	1,120	14,010
Yield (kg lint/ha)	250	746	234	368	387	475
Prod. (m. tons)	10,000	3,689	668	1,869	433	6,659
1993/94						
Area (ha)	41,000	1,813	2,473	6,120	1,608	12,014
Yield (kg lint/ha)	366	496	485	376	118	402
Prod. (m. tons)	15,000	899	1,199	2,303	433	4,834
1994/95						
Area (ha)	42,000	5,125	2,597	6,936	1,366	16,024
Yield (kg lint/ha)	392	844	260	546	217	567
Prod. (m. tons)	16,000	4,325	674	3,787	296	9,082
Average						
Area (ha)	41,000	3,964	2,643	6,045	1,365	14,017
Yield (kg lint/ha)	333	749	309	439	224	437
Prod. (m. tons)	13,667	2,971	847	2,653	387	6,858

[1]Source: International Cotton Advisory Committee.
[2]Source: Individual enterprise farm records and data provided by the Textile Sector Task Force.

Exhibit V-2. Market Channels and Pricing Points for Cotton in Ethiopia

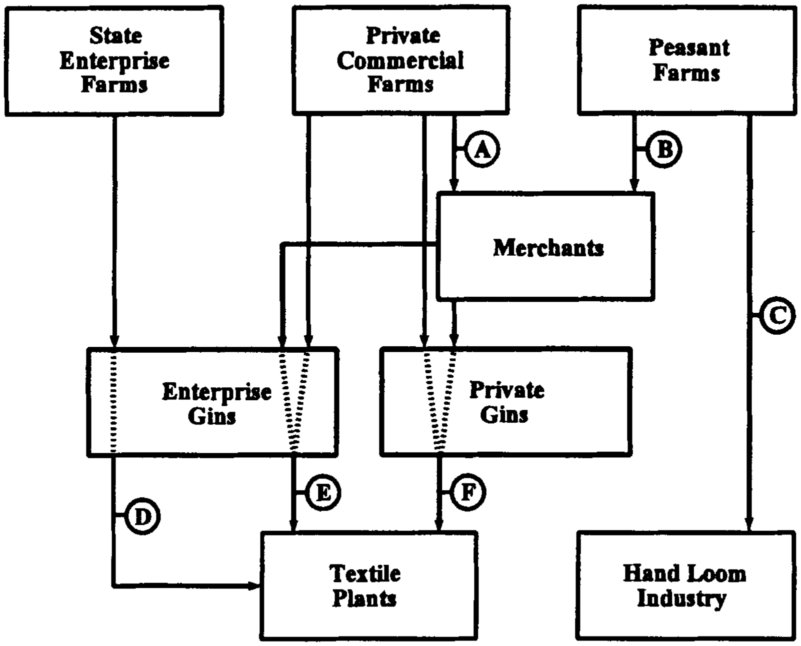


Exhibit V-3. Price Schedule for Cotton with Alternate Grades and Staples, for State Enterprises in Ethiopia, 1995 (Br/100 kg lint cotton)

Staple (in)	Grade								
	GM	SM/GM	SM	M/SM	M	SLM/M	SLM	LM/SLM	LM
1 ¼	1144.885	1140.316	1135.102	1126.115	1116.493	1107.316	1098.107	1084.391	1071.279
1 7/32	1140.297	1135.264	1131.079	1121.063	1111.904	1102.724	1093.552	1179.804	1066.058
1 3/16	1135.291	1130.238	1125.187	1116.026	1109.203	1097.691	1088.512	1074.766	1061.020
1 5/32	1131.602	1126.563	1121.531	1112.368	1103.207	1094,034	1084.861	1071.109	1057.362
1 1/8	1128.396	1123.357	1118.320	1109.161	1100.000	1090.822	1081.648	1067.899	1054.150
1 3/32	1026.106	1122.450	1116.032	1106.868	1097.682	1088.520	1079.361	1065.611	1051.876
1 1/16	1121.531	1116.939	1112.354	1103.193	1094.134	1084.865	1075.681	1061.932	1048.183
1 1/32	1103.207	1098.620	1088.540	1084.859	1075.675	1066.519	1057.362	1048.200	1039.040
1	1081.647	1077.058	1072.471	1063.314	1056.378	1044.993	1039.041	1029.866	1020.689
7/8	1066.538	1061.949	1057.362	1048.200	1039.041	1029.866	1020.689	1011.526	1002.369

Source: Textile Sector Task Force.

Alternatively, the commercial farm may retain ownership of the cotton, have it ginned (by private or enterprise gins at a commercial rate of 20-30 birr/100 kg of seed cotton). Seed cotton is sometimes hauled distances of several hundred kilometers for ginning. Commercial farms then sell to a textile plant, thus establishing the pricing points E and F in Exhibit V-2. If this market is competitive and quality of ginning is equal, arbitrage should cause prices at E and F to be equal. How the prices at points E and F compare to prices at point D is not known. Prices at points A and B may be similar if arbitrage is effective, but they may also be different if the marketing knowledge and/or market information of commercial and peasant farmers differs.

Transactions between peasant farmers and the hand loom industry is a separate market, and the prices established at point C are likely different from the others (perhaps with a different pricing structure).

Grading cotton quality by "classing" the cotton can assist in its marketing. Ethiopia uses a composite grade that considers whiteness, trash content, and staple (fiber length). Both of these grade factors are evaluated by a classer's subjective judgement. Textile mills reportedly evaluate these factors in the same manner, and may use the micronaire (an indicator of fineness and maturity), the pressley or stelometer (measures of fiber strength), or the Shirley analyzer (a measure of non-lint content), etc. When seed cotton is sold, it is also reportedly graded using the same standards as lint cotton. On occasion, the cotton is graded before and after ginning.

Graders are licensed, but it is unclear whether their judgments are checked and validated. The system appears to be subject to potential inaccuracies and abuse. Moreover, the lack of an effective system of price reporting makes market price discovery difficult.

After ginning, seed is sold to oil mills, where it is separated into components—linters, seed hulls, oil, and meal—and further marketed and processed. The crude processed oil may go to a refinery, where it is further processed for edible/cooking oil. State enterprises do not process seeds, except for replanting.

A3. Evidence on Cotton Fiber Properties

To arrive at authoritative measurements of the principal fiber properties of cotton grown in Ethiopia, a ginned lint sample of cotton was taken from the Middle Awash Agricultural Development Enterprise. The sample was taken from the fiber transport system of the gin just before the cotton lint was to enter the gin press. The sample was shipped back to the International Textile Center at Texas Tech University, where it was tested by a full range of instruments under ambient conditions that meet specifications for classing. The test results are summarized in Exhibit V-4.

The manager at the Middle Awash Agricultural Development Enterprise indicated that the variety of cotton sampled was Delta Pine 90. The test results obtained are consistent with the properties of this variety; indeed, they are generally equal to or better than the properties exhibited by the Delta Pine 90 grown in the United States. One exception is the amount of foreign matter measured by the Shirley Analyzer. With U.S. harvesting and ginning, total waste would be below 5 percent, rather than the 8.16 percent obtained for the sample from Middle Awash.

There was also a great discrepancy between the fiber strength as measured by the HVI versus the Stelometer. The Stelometer strength reading is typically about 26 percent below the HVI strength reading, but it is rare for it to be 35 percent lower, as shown in Exhibit V-4. These results were verified with additional testing, but an explanation for the large difference cannot be given.

With cotton of this quality, a modern spinning plant could easily make high quality yarns in the upper ranges of the medium counts. The upper range of yarn counts that are commercially feasible would be near Ne 50.

Exhibit V-4. Cotton Fiber Test Data on Sample Collected from the Middle Awash Agricultural Development Enterprise

Test	Test Result
High Volume Instrument (HVI) Data	
Micronaire index	4.2
Upper half mean length (in)	1.18
Upper half mean length (mm)	30
Length uniformity index (%)	83
Strength (g/tex)	31.5
Elongation (%)	6.0
Leaf grade	1
Color grade	41
Advanced Fiber Information System (AFIS) Data	
Upper quartile length (in)	1.18
Upper quartile length (mm)	30
Short fiber content (%)	8.6
Visible foreign matter (%)	1.68
Trash particles (no./g)	80
Neps (no./g)	190
Stelometer Data	
Strength (g/tex)	20.4
Elongation (%)	6.2
Shirley Fineness & Maturity (FMT III) Data	
Maturity (%)	89
Fineness (um)	159
Shirley Analyzer Data	
Visible foreign matter (%)	7.44
Invisible loss (%)	0.72
Total (%)	8.16

Source: International Textile Center, Texas Tech University

B. Farm Enterprise Analysis

The North Omo, Middle Awash, Tendaho, and Abobo enterprises are distinct facilities in organization, physical characteristics and resources, and management. While they operate separately, they have some similarities in terms of organization, methods of operation, and common problems. This section focuses on their major similarities and differences, particularly as they may relate to the resolution of their problems. Descriptions of the enterprise units, evaluations made from site visits and meetings with numerous individuals, and enterprise data, are provided in Annex C (North Omo), Annex D (Middle Awash), Annex E (Tendaho), and Annex F (Abobo).

B1. Production Costs

Using the 1993-1995 crop years as a basis, the weighted average cost of producing a kg of lint (excluding land rent and seed value) by the four public sector enterprises is approximately Br 10.24. This is high compared to the production costs of other cotton producing countries as shown in Exhibit V-5. The production costs summarized there exclude land rent and seed value and are expressed in U.S. dollars. The value of the seed ranges 10 to 20 percent of the value of the cotton lint. If the seed value is known, the costs shown in the table can be reduced by an appropriate percentage. It is, however, practically impossible to know the seed value for many countries.

With an estimated cost of $1.64/kg, public sector enterprises in Ethiopia are clearly among the countries having the highest cotton production costs. Ethiopia will thus be unable to compete in the major export markets, except during years of global cotton shortage. (To compete consistently in export markets, the cost should be lowered to $1.10-$1.20/ kg; i.e., Br7.00-Br7.50/kg.)

Exhibit V-5. Comparative Costs of Producing Upland Cotton in Selected Countries (Excluding Land Rent and Seed Value)

Country	US$ per Ha	US$ per Kg
Argentina[1]	650.06	1.08
Australia[1]	1,172.82	1.15
Bolivia[2]	768.80	1.13
Côte d'Ivoire[2]	486.31	0.92
Ecuador[2]	1,039.11	1.73
Ethiopia[3]	**736.38**	**1.64**
Guatemala[1]	1,672.82	1.54
Israel[2]	3,503.94	1.95
Mexico[2]	1,463.45	1.18
Nicaragua[1]	1,181.26	1.43
Pakistan[2]	731.89	1.03
Paraguay[2]	846.82	1.72

Country	US$ per Ha	US$ per Kg
Turkey[1]	1,855.52	1.43
Uganda[1]	322.53	1.65
United States of America[2]	868.99	1.41
Zimbabwe[2]	406.23	1.11

Sources: All data taken from ICAC except for Ethiopia.
[1]Based on 1991 crop year.
[2]Based on 1995 crop year.
[3]Based on 1992-95 crop years.

B2. Production Practices

All farm units tend to have similar field operations. Although not all field operations were observed, observations of field preparations and descriptions of other cultural practices indicate that they do not vary much, except for irrigation practices. Irrigation differs mostly at Tendaho, where farmers pump water and use some flood irrigation, and at Abobo, where there is no irrigation. The other two enterprises use gravity flow and furrow irrigation. There were no indications of serious plant disease problems and the insect pest problems seemed to be manageable with insecticides; all farms indicated that they use insect scouting in their insect control programs. None of the farms currently receive fertilizer applications; North Omo was fertilized in prior years, but stopped several years ago. Likewise, none of the enterprises periodically plant with certified seed. They replant gin-run seed which diminishes seed vigor and limits the introduction of new varieties.

Foregoing the use of fertilizer and new seed suppress yield potential. Research indicates that cotton responds well to carefully developed fertilizer applications, and that soil fertility programs are economical on all soils *except* those recently placed under cultivation. Most of the experimental data in Ethiopia are out of date, having been drawn from areas put into cultivation years ago. Research shows that cotton yields and quality attributes (fiber length, strength, fineness, etc.) begin to decline after two to three years of replanting seed, and that replanting the same seed is detrimental after three to five years. Scientific evidence suggests that certified seed should be used *at least* every five years.

The practice of hand cutting and burning cotton stalks could be replaced by a more cost-efficient method. Using mechanical stalk cutters or shredders to chop stalks into small pieces and working the stalks back into the soil with disk or moldboard plows has the advantage of adding organic matter to the soil and may be less expensive than disposing of them by hand. The cost of investing in equipment is low, and its repair and maintenance are not difficult.

The three irrigated enterprises experience soil salinity build-up, a problem that is worsened by applying more water than needed. It is not known how well the drainage system under construction at Middle Awash will work, but systems such as this are not economically feasible if farms are required to bear their cost. The land may have to be abandoned after a period of years, as is happening at North Omo and Tendaho, or perhaps salt tolerant crops can be introduced.

Irrigation also deposits silt in canals and pipes, a problem that can be resolved by dredging and cleaning. The silt problem makes underground pipes impractical.

Damage from uncontrolled livestock grazing is a major problem, especially at the two eastern enterprises (Middle Awash and Tendaho). Traditional property rights involving livestock grazing grew out of a pastoral society, but the costs in terms of crop production are great. Reducing the problem requires government intervention and probably redefinition of livestock owners' rights, which is politically unpopular. Cotton enterprises can minimize the cost of livestock damage by planting some areas for grazing thus mitigating damage to cotton. Perhaps a policy compromise could allow farms to provide improved pasture (perhaps even on saline soils) in exchange for the right to prohibit livestock on cropland.

The ginneries have the physical capacity to process all the cotton produced, at least with some modernization and refurbishment. Employee training on machine adjustments and maintenance is needed, with an emphasis on preserving the quality of the cotton. The investment required in equipment is probably not large by investment standards in the industry. A larger problem is the unreliable public power supply. Power outages and fluctuations cause numerous problems, all of which substantially increase the cost of ginning and cause serious problems in the quality of ginned lint.

Farm equipment and its maintenance appear to vary considerably among enterprise units. Improved availability of parts and supplies would solve many problems, as would better management of maintenance functions.

B3. Management Practices

The task force emphasized three primary management areas: employment practices, financial management, and analysis of costs and revenues. The most obvious input misallocation—the employment of too many people (the situation at Abobo *may* be an exception to this generalization)—is a result of the socialist system and is unrealistic given the enterprises' current goals. The enterprises are required by government decree, local political pressure, or both, to support a local welfare system, which is inconsistent with efficient operation of the enterprise. Whatever welfare system the country wishes to have must be supported by the citizenry at large, not by specific enterprises. This team believes that the number of permanent employees is too large by *at least* fifty percent, and by more at some enterprises. Eliminating this work force would increase production, increasing efficiency and reducing costs. Management also needs the authority and responsibility to hire and retain employees based on productivity considerations, as well as the prerogative to tie wage rates to productivity and labor market considerations. Management's attention to personnel supervision and direction varied between the two enterprises visited. Management seems to have the attitude that they are not *accountable* for the outcomes of enterprise activities. They also perceive that no consequences are associated with the positive or negative results of their actions.

The financial records and cooperation provided by the enterprises varied widely in clarity, completeness, and detail. Based on the records made available to the team, the accounting systems have not been implemented to facilitate accountability, management decisions, or identification of specific cost components. Terms such as "overhead" seem to be used to mean different things or refer to different categories of costs. Managers do not appear to view financial matters, such as borrowing, credit, interest, loans, etc. as "real" phenomena; they are viewed instead as abstractions recorded on paper that are unrelated to the activities of the enterprises.

Consequently, all costs except those that require a cash outlay are largely ignored in the decision making processes.

The enterprises are thus unable to borrow operating capital because of the long-term debt they have accumulated and the absence of assets to use as collateral. As a result, much cotton land is left out of production because they lack operating funds (even though most of the permanent labor force is kept on the payroll). The government has little choice but to absorb the accumulated debt; the enterprises were bankrupt even before they were reorganized back in 1992. The enterprises will never be able to pay their debts and with no private investor willing to assume them, the government will be left with the responsibility of the results of the previous structure.

Exhibit V-6 summarizes some costs and other performance indicators of the enterprises. Tendaho, the only enterprise showing a gross profit rather than a loss over the three-year period, also had the lowest payroll cost relative to total operating costs. Tendaho also had the highest average price received for lint over the period. Overall, Middle Awash showed the poorest economic performance, even though it had the highest yields. Abobo had the lowest yields and equaled Middle Awash for the highest cost per kg of cotton. Middle Awash is probably using too many inputs—especially labor, but perhaps machinery inputs[2] as well—as evidenced by the high costs per ha and kg of lint. Abobo is probably using too few inputs (weeding and harvesting labor), resulting in low average yields and high unit costs.

Exhibit V-6. Comparative Data on Cotton Production on the Ethiopian State Enterprise Farms, 1992/1993-1994/1995

Indicator	Enterprise			
	North Omo	Middle Awash	Tendaho	Abobo
Ha cotton/perm. employee	1.6	2.6	5.8	6.8
Yield (kg/ha)	309	749	439	224
Operating cost:				
Br/ha	3,211	7,996	4,525	2,393
Br/kg lint	10.00	10.66	10.31	10.68
Br/ kg seed cotton	3.64	3.74	3.61	3.74
Annual gross profit (loss):				
Total Br	(2,079,400)	(4,906,500)	806,100	(438,000)
Br/ ha	(787)	(1,238)	133	(321)
Br/permanent employee	(1,252)	(3,260)	774	(2,200)

[2]These costs could not be estimated because of the lack of detailed data.

Indicator	Enterprise			
	North Omo	Middle Awash	Tendaho	Abobo
Payroll as percent of operating cost	73	71[1]	47	93
Avg. price of lint (Br/kg)	7.8	9.0[2]	9.9[3]	8.3
Avg. revenue/kg seed cotton (Br)	2.73	3.16	3.86	3.24

[1]Actual price is higher, but the amount is uncertain.
[2]Actual price is lower because other revenue could not be separated from total revenue.
[3]Gross profit is positive, even though the price of lint is less than the operating cost/kg lint, because the enterprise has other revenue (primarily from seed and ginning).

A reason for the large differences in average prices is that annual prices are weighted by the annual volume of production during each of the three years covered; annual production varied significantly among the enterprises. Another reason for the differences is that Middle Awash and Tendaho both exported cotton one year, thus raising their average price. The differences highlight the importance of marketing for revenue and profit considerations. With only a 6-7 percent difference in cost between the highest and the lowest, the operating cost per kg of lint among the four enterprises is suspiciously close. This is very unusual for production units operating so differently in such different environments.

B4. Alternative Scenarios for the Enterprises

We now shift to the alternatives for improving each enterprise's economic situation. This exercise involves *assuming* certain conditions that appear feasible based on the data available, observations of the enterprises, and experience. This exercise is tailored to the enterprises visited, although its application to others will help illustrate how administration and management might evaluate possibilities.

It must be emphasized that this is an exercise in examining possibilities, not a set of projections. To project the outcomes of changes in structure and practices, a detailed study would be required using specialized management consultants.

Results of the post-restructuring cost and revenue scenarios are summarized for each of the public farm enterprises in Exhibit V-7. For comparison, three-year average cost and revenue data for each enterprise are included.

North Omo

To analyze impacts of alternative changes for the North Omo Agriculture Development Enterprise, make the following assumptions:

- Labor use is reduced by half, thereby reducing direct labor cost to an average of 758,750 Br per year (half of the 1,517,500 Br), its overhead cost to 2,236,400 Br, and its salaries to 107,700 Br. This would raise the enterprise's land area per permanent employee from 1.6 ha (see Exhibit V-6) to 3.2 ha.

- New tractors and equipment are purchased. The cost of new equipment is probably near the stated book value of the existing, worn out equipment. Thus, assumed depreciation or interest on equipment do not need to be adjusted in this scenario.

- Each year, twenty-five percent of the seed requirements are obtained by purchasing certified seed and a program of annual fertilization is established. To pay for this, allow a 15 percent increase in annual materials costs (from 844,700 Br to 971,400 Br). Assume a 75 percent increase in yields from cotton (which may be a conservative allowance in the case of North Omo), and the same prices (7.8 Br/kg from Exhibit V-6).

These assumed changes would transform an annual loss of Br 2 million into an annual profit of Br 5.6 million (see Exhibit V-7). The enterprise's payroll account would drop to 56 percent of total operating cost (down from 73 percent). Its total operating cost would decrease to 2,084 Br/ha (a reduction of 35 percent) and 3.85 Br/kg lint (a reduction of 62 percent).

Land has no monetary value in Ethiopia, but to account for its contribution to the value of production, assume a realistic asset value of 6,000 Br/ha for the cropland at North Omo (15.8 million Br for the 2,643 ha of cotton land). Using an interest rate of six percent to represent the opportunity cost of all capital assets, the interest cost on land (including improvements), machinery, and equipment would be about 1.8 million Br. This would result in a net revenue before taxes of about Br 3.8 million, or about 1,457 Br/ha (Exhibit V-7).

Middle Awash

In the case of the Middle Awash Agriculture Development Enterprise, assume that the labor force, and thus the payroll, is reduced by half, resulting in the numbers for direct labor and overhead shown in Exhibit V-6. (Note: Salaries are not reduced because they could not be identified in the data provided by the enterprise.) Assume the same 15 percent increase in direct materials cost as for North Omo (to pay for fertilizer and certified seed). Assume that yields are increased by 15 percent and revenues are increased by 10 percent. (Note: The enterprise has revenue from lint sales and other activities, but they cannot be separated because the requested data were not provided). Assume no change in direct machinery and operating expenses.

The scenario for Middle Awash transforms an annual loss of Br 4.9 million to a gross profit of Br 9.5 million. Allow 6,000 Br/ha valuation on land/improvements (the same as North Omo), assume machinery and equipment valued at Br 15 million, and use the same six percent interest rate. The result is a cost for the "other" category of Br 2,329,000 (Exhibit V-6).

Exhibit V-7. Impacts of Post Restructuring Cost and Revenue Scenarios on the State Enterprise Farms (1,000 Birr)

Item	Enterprise							
	North Omo		Middle Awash		Tendaho		Abobo	
	1993-95 Average	After Changes	1993-95 Average	After Changes	1993-95 Average	After Changes	1993-95 Average	After Changes
Revenues	6,376.8	11,159.4	26,789.5	29,468.5	29,266.7	37,048.5	2,829	3,722
Operating costs	8,482.9	5,507.1	31,696.0	19,929.8	27,354.3	25,883.9	3,267	4,053
Materials	844.7	971.4	1,766.3	2,031.2	5,143.9	5,915.5	404	506
Direct labor	1.517.5	958.8	3,514.3	1,757.2	6,104.9	4,883.9	394	394
Direct machinery	1,087.5	1,087.5	1,834.4	1,087.5	3,629.7	3,629.7	267	294
Overhead	4,472.8	2,236.4	19,054.3	9,527.2	7,306.5	6,708.6	2,202	2,202
Operating expenses	560.7	453.0	5,526.7	5,526.7	5,169.2	4,746.2	657	657
Gross profit	-2,079.4	5,652.3	-4,906.5	9,538.7	806.1	11,164.6	-438	-331
Other costs	2,353.5	1,802.0	6,585.1	2,329.0	8,663.2	3,378.3	441	1,080
Net revenue (before taxes)	-4,452.8	3,850.3	-11,491.6	7,210.7	-7,857.1	7,786.3	-879	-1,411

Operating costs under this scenario would become 5,028 Br/ha (a reduction of 37 percent) and 5.84 Br/kg lint (a reduction of 45 percent). The resulting annual net revenue would be Br 7.2 million.

Tendaho

The Tendaho Agriculture Development Enterprise faces the most serious livestock damage of all the enterprises. The estimates below are made assuming the problem is *not* resolved. If the regional government could help alleviate this problem, yields would increase substantially and cost/kg lint would be lower than estimated.

Since labor is not as much in excess at Tendaho, assume only a 20 percent decrease in the labor force. This reduces direct labor to Br 4,883,900 and salaries to Br 4,084,100 (see Exhibit E-2, Annex E). Assume no other changes in operating expenses and no changes in direct machinery expenses. As in the previous examples, assume a 15 percent increase in materials cost to cover fertilizer and certified seed. Limit the yield increase to 30 percent, allowing for the continued livestock damage. Continue with the assumed land/improvements value of 6,000 Br/ha (giving Br 36.3 million for 6,045 ha), assume Br 20 million worth of machinery and equipment, apply the same six percent interest rate, and add a 25,000 Br/year audit fee. This results in other costs of Br 3,378,300 (Exhibit V-6).

Achievement of the performance suggested by these assumptions would lower Tendaho's operating costs to 4,282 Br/ha (a five percent decrease) and 7.92 Br/kg lint (a 23 percent decrease). The resulting annual gross profit is Br 11.2 million (up from Br 0.8 million) and a net revenue before taxes of Br 7.8 million (compared to a *loss* of Br 7.9 million).

Abobo

The Abobo Agriculture Development Enterprise presents the most difficult case for which to project the impacts of changes. The following assumptions are used:

- A conversion to the use of herbicides adds 60 Br/ha (or a total of Br 81,900) and a conversion to the use of certified seed adds 15 Br/ha (or a total of Br 20,475). These changes would constitute a 25 percent increase in direct materials cost, to Br 506,000 (Exhibit V-6).

- Yields increase 35 percent, to 300 kg/ha, resulting in an increase in income of 32 percent, to Br 3,722,000 (see Exhibit V-6).

- Direct machinery costs increase 10 percent to cover operation of mechanical harvesting, but there is no change in direct labor, operating expense, or overhead (see Exhibit V-6).

These changes would cause an increase in annual operating costs of 24 percent (to Br 4,053,000), and a reduction in the annual operating loss of 24 percent (to Br 331,000).

Using the same 6,000 Br/ha land value as for the other enterprises (totaling Br 8.0 million for the cotton land), assume a value of Br 10 million for machinery and equipment (including mechanical harvesters), and use a six percent interest rate. This results in other costs of Br 1.08 million (Exhibit V-6).

The foregoing scenario would still leave Abobo with a net annual loss of Br 1.4 million (compared to the current three-year average loss of 0.9 million). If, however, the scenario happened to increase yields by 100 percent instead of 35 percent—which is possible, given the very low average yields—then operating costs would be lowered sufficiently to enable an annual profit of Br 1.6 million. This illustrates the sensitivity of the outcomes to assumptions made and points out the necessity for more in-depth analysis to enable more confident projections.

C. Conclusions and Recommendations

Even though these scenarios are illustrative, they are achievable. Fully realizing them, however, would require structural changes in the system, including the provision of incentives to induce the desired performance from managers and workers.

Our conclusions and recommendations are of two categories: policy and management. The policy conclusions and recommendations focus on problems the government must resolve because individual economic units, or individual industries, cannot. The recommendation for management include matters independent of government action on which the economic units can focus.

The policy conclusions and recommendations are presented first because they are the most critical. The changes management might make in approach and strategy will have little impact unless the structural changes outlined in the policy recommendations are implemented. We therefore recommend that the government implement the following recommendations before management takes action.

C1. Policy Conclusions and Recommendations

In the case of the farm enterprises, privatization should be carefully considered to avoid the destruction of resources already developed. This requires that the government recognize that the book value of these assets is not realistic or relevant to solving the problems; assets must be sold for a price that will enable buyers to make an adequate return on their investment. If the government does not sell them, they will continue to drain government resources that are desperately needed to achieve other objectives (discussed below). The enterprises may have to be broken into farm units for disposal, or in some cases farm units may have to be broken up. To foster the future production of cotton, or any crop other than basic food and staples, privatization must be accomplished in a manner that maintains commercial crop production on developed lands. Otherwise, the large social investment in development will be lost, and cotton production to support the country's textile industry will diminish or disappear. The government may need to reconsider its position on private ownership of land to allow commercial farm units to borrow for operating expenses. Allowing a degree of foreign ownership in commercial crop production could also attract the capital and management expertise that will help farming operations in the country function efficiently.

Focused **social programs** can deal with social issues that are independent of business activities. Business management must be allowed to make management decisions and build its own incentive structure without being required to bear the cost of the country's employment and poverty problems. Attempts to integrate social programs with business activity creates a system in which it is difficult to achieve either set of objectives.

The government should take a role in developing **infrastructure**—power, transportation, communication, and water supply—to advance the country economically. Without infrastructure, which only government can facilitate, the production/business sectors (agriculture included) cannot expand and progress over the long term. The agriculture, industrial, service, and other sectors cannot build this infrastructure on their own. For example, efficient ginning is possible only if electric power is dependable and reasonably priced. Products can be moved at reasonable costs if, and only if, reasonably priced rail facilities and/or roads that do not destroy transporting equipment are available. If people cannot communicate readily and economically, then markets do not function properly and production efficiency declines because of the lack of information.

Tax rates need to be structured to promote incentives; this incentive structure is essential for economic units to perform in the broader social interest. Economic units must help support government activities, but if tax rates are too high they discourage production. High tax rates mean that economic units produce less (and receive less income) and that the government receives less. Everybody then loses. If owners and managers do not expect to benefit from profits, then they have the incentive to use them rather than give them to the government. Managers view an excess payroll as superior to paying taxes because the gratitude of local citizens offers more benefits than serving a faceless government. This may partially explain why the average costs of production are almost the same across all farm enterprises, regardless of production practices and yields.

Policies must be developed to control **damage from livestock grazing** and implemented by, or in conjunction with, regional/local governments. Property rights, as they are now defined, will need to be re-examined from a political standpoint. All rights currently lie with livestock owners, but this policy imposes a high cost on the agricultural economy in the form of lost production and the multiplied revenue from it. If Ethiopia desires self-sufficient farms, then these farms must have the right to protect their cash crops from destruction. Denying them this is tantamount to denying their right to exist. A workable *balance* between the rights of livestock owners and crop producers must be found; otherwise, cotton farms cannot compete without subsidization.

C2. Management Conclusions and Recommendations

Incentive structures that induce labor and management to achieve efficiency (in production, processing, financing, etc.) must be developed. This structure should reward performance/results and penalize their absence, while recognizing and adjusting for abundances and shortages of skills and abilities in the market. Any fixed, administered wage/salary structure will threaten an enterprise that depends on productivity to survive. Incentive-based structures are more difficult to devise and administer effectively, but with good management and deliberate decisions, effective results can be achieved.

Records and accounting systems should be realistic and used for management and planning. Unless asset valuation is realistic and accurate, the true costs of operation cannot be known. Management must also be willing to absorb this information and act on it.

Management decisions should be re-focused to recognize alternative ways to carry out production, processing, and marketing activities. Management should also evaluate the likely cost and revenue effects of various alternatives. Additional education/training for managers and supervisors may be warranted. The use of management consultants could also be a high-return investment as would sending key people out of the country for specialized training/education.

Questioning and examining **input strategies** is important, especially when using fertilizers and planting seed. Current practices on public enterprise farms with respect to these inputs would benefit from the recommendations of scientific literature and practical experience.

List of References

Abebe, Mearin, ed. Cotton Production Under Irrigation in Ethiopia. Symposium Proceedings, Institute of Agricultural Research, Addis Ababa, October 1982.

Cargill Technical Services Inc. Ethiopia Cotton Sector Assessment Final Report, Appendix III, Cotton Growing Report. Prepared for United States Agency for International Development, Project No. 663-051P, November 1994.

International Cotton Advisory Committee. Documents of the ICAC, Vol. 2. Washington, D.C., April 1995 (CD-ROM).

SECTION VI

TECHNICAL EVALUATION OF PUBLIC TEXTILE SECTOR

PREVIOUS PAGE BLANK

SECTION VI
TECHNICAL EVALUATION OF PUBLIC TEXTILE SECTOR

The public textile sector is the primary focus of this study. For purposes of exposition in this report, the public textile sector consists of those enterprises engaged in the spinning, weaving, dyeing and finishing of cotton and other textile fibers, and the cutting and sewing operations that make garments from textile fabrics. Thus, in the public sector there are 14 textile enterprises: eight are integrated textile manufacturers (i.e., performing two or more major functions in the manufacture of fabrics), two deal primarily with yarns, and four are garment manufacturers (Exhibit VI-1).

The focus in this section will be on the issues and factors pertinent to the technical or operational efficiency of the enterprises in the public textile sector. Technical efficiency is absolutely necessary to compete in a domestic market, much less in export markets.

The technical team made on-site visits to all the textile enterprises. Three enterprises were selected as technical case studies; these were the Dire Dawa Textile Factory, the Kombolcha Textile Factory, and the Awasa Textile Factory. These are written up in Annex G (Dire Dawa), Annex H (Kombolcha), and Annex I (Awasa). More limited reports on other factories are given in Annex J (Arba Minch), Annex K (Bahar Dar), Annex L (Debre Birhan), Annex M (Adei Abeba), Annex N (Akaki), Annex O (Edget), and Annex P (Nefas).

This section provides a brief global perspective on Ethiopia's textile sector, as seen from the perspective of international textile engineers and technicians. The technical team's observations on the sector, organized around the major processes involved in textile manufacturing, follows. We focus on spinning, weaving, dyeing, finishing, and completed garments, as well as inspection, quality control, and the water treatment and boiler facilities that serve these factories. We identify problems and offer recommendations for improving the technical efficiency of each process.

A. Global Perspective

A1. Industry Size and Employment

Ethiopia's textile sector is one of its largest industries and over the last 20 years has become a repository of an inordinately large number of workers. Current estimates of employment by the 14 textile enterprises covered in this section put the total at 25,820 people (Exhibit VI-1), probably three times as many workers as would be employed in comparably sized private sector textile enterprises in the rest of the world.

If all Ethiopia's textile spinning machinery listed as viable on public sector records were capable of producing at its rated capacity, about 60,000 tons of cotton consumption would result if the machinery were run at 100 percent capacity utilization (see Exhibit IV-6). Good performance for Ethiopia would be 95 percent capacity, with about 57,000 tons of cotton consumption and about 53,000 tons of cotton yarn output. Assuming comparable standards for weaving capacity, the Ethiopian textile industry could weave this amount of yarn.

The team has observed enough of the industry to know that some spinning facilities, and significantly more weaving facilities, are technically unable to produce at their rated capacities.

136

Even if they were able to do so, however, the team believes that total employment in the textile sector could be reduced by half without jeopardizing the ability to achieve 95 percent capacity utilization. Indeed, distilling the labor force to a core of efficient operators is necessary to achieve consistently high levels of capacity utilization.

Only about 13 percent of the total employment of public sector textile enterprises is in the garment manufacturing segment. Garment manufacturing typically absorbs large amounts of labor because it is the least capital intensive and most labor intensive part of the textile sector. Garment manufacturing tends to migrate to regions and countries where labor costs are lowest. Section IV explains why this is not the case in Ethiopia.

Exhibit VI-1. Current Employment Levels in the Public Textile Sector of Ethiopia

Enterprises	Number of Employees
Integrated Textile Manufacturers	
■ Adei Abeba Yarn Factory	3,629
■ Akaki Textile Factory	4,878
■ Arba Minch Textile Factory	915
■ Awasa Textile Factory	1,260
■ Bahir Dar Textile Factory	2,507
■ Debre Birhan Blanket Factory	902
■ Dire Dawa Textile Factory	4,837
■ Kombolcha Textile Factory	2,306
	21,234
Yarn Manufacturers & Finishers	
■ Edget Yarn Factory	867
■ Nefas Silk Sewing Thread Factory	415
	1,282
Garment Manufacturers	
■ Akaki Garment Factory	
■ Addis Garment Factory	1,471
■ Gulelie Garment Factory	447
■ Nazareth Garment Factory	661
	725
	3,304
Total Employment	25,820

Source: Textile Task Force, PESA

A2. Industry Labor Costs

Labor costs in Ethiopia are low, as documented in Exhibit VI-2, which compares the hourly labor cost estimate for Ethiopia, as estimated by the study team, with estimates for other countries, as made by Werner International. Even allowing for inaccurate estimates, the estimated labor cost of 29 U.S. cents per hour (approximately Br 1.85 per hour) for Ethiopia compares favorably with the rest of the world. Only low labor productivity—or the failure of support structures such as energy, communication, transportation, and distribution—will prevent Ethiopia from competing in labor intensive industries.

Exhibit VI-2. Labor Cost Comparisons, 1994

Country	Hourly Cost (US$)
Japan	25.62
West Germany	20.77
USA	11.89
South Korea	4.00
Mexico	3.22
Peru	1.70
Poland	1.51
Egypt	0.64
India	0.58
China PR	0.48
Indonesia	0.46
Pakistan	0.45
Zambia	0.43
Sri Lanka	0.42
Kenya	0.41
Vietnam	0.39
Ethiopia	**0.29**
Bangladesh	0.26

Source: Estimate for Ethiopia made by project team. All others from Werner International, *Textile Month*, November 1995.

A3. Management, Maintenance, and Labor Productivity

A detailed discussion of management and organization issues is available in Section III. The brief comments here give the perspective of some international textile technicians. Visits to the front offices and production floors of the factories revealed that the management of the Ethiopian public textile sector does not have the authority necessary to command the laborers and to set guidelines for employee conduct. Responsibility without authority is a stressful and frustrating combination; this is true whether it applies to general managers, production managers, or department heads. Both management and labor conduct revealed that public sector textiles in

Ethiopia are a quasi-political fiefdom that precludes a strong focus on efficiency and productivity. The clues were many, including the following:

- Machinery is often stopped for coffee breaks, lunch, and shift changes.
- Workers fail workers to do obvious tasks needed to improve production processes.
- Training programs are not translated into work habits.
- Managers fail to make operational decisions without the approval of the board of directors.
- Surly attitudes of guards toward people whom they know to be in positions of authority.
- Parts and input inventories have been built up without considering need.

Pervasive evidence indicates that the details of design and construction have not had the benefit of management with strong textile engineering experience; rather, they appear to have been handled by committees, in consultation with machinery vendors. They give precedence to obtaining all equipment from one source, and in the process get obsolete technology, rather than selecting the machinery and equipment with the best and most appropriate technology. Cost-effective, environmentally friendly designs in finishing processes are also lacking. Facilities should have been designed to recover and reuse caustic solutions and steam, rather than simply releasing them into the environment.

Maintenance, beginning with basic cleanliness, needs to be addressed. Of course, repairs must be done on a timely basis, but a greater emphasis needs to be placed on *preventive* maintenance. Cleanliness is the first step toward an effective preventive maintenance program. It must also include training and scheduling to recognize developing problems, followed by actions to prevent machine failures, excessive wear, and poor performance. Such a program would add years to the life of expensive machinery and reduce repair costs significantly. Only by claiming the benefits that derive from a comprehensive approach to maintenance can Ethiopia hope to compete in a global market.

A4. Industry Cost Components

No business subject to open-market competition can survive unless its management has a working knowledge and control of the costs incurred in producing and marketing its products. The responsibility for administering and controlling costs rests with top management, who must calculate costs based on the fundamental selling units of the enterprise, such as kilograms of yarn, square meters of fabric, units of garments, etc. A common denominator for costing (and pricing) is a necessity.

A costing system for manufacturing enterprises has three general divisions: direct, indirect, and overhead. Each will be briefly discussed.

A4a. Direct Costs

The two major categories of direct costs are raw materials and labor. Even though the hourly cost of labor in Ethiopia is clearly low relative to global standards, the cost of labor must be determined by estimating how much labor is needed to produce one unit of output. If labor input is not efficient, a low hourly cost for labor can easily become a moderate or high labor cost per unit of product sold.

In determining the cost of raw materials, the price of a raw material such as cotton must be adjusted for the waste generated at each stage of the manufacturing process. Thus, if the waste resulting from opening and cleaning the baled cotton is 6 percent, then the price per kilo of cotton must be multiplied by 1.06 to determine its actual cost at that stage of the process. Furthermore, this adjustment procedure must be repeated at each stage of the manufacturing process (carding, drawing, combing, roving, spinning, weaving, dyeing and finishing, cutting and sewing, etc.). The cost thus accumulates because waste occurs at each stage. Obviously, a loss at the latter stages of a manufacturing process must also bear the burden of the total cost of all previous steps, including the accumulated cost of waste and the expense of executing the previous steps.

A4b. Indirect Costs

Even with acceptable efficiency in controlling direct costs, a competitive advantage may easily be lost by failing to control indirect costs. By definition, indirect cost items impact the per unit cost of every unit sold by an enterprise. If an enterprise is operating on borrowed money, the impact of these costs may become much more burdensome.

Major indirect cost items include:

Packaging materials. Whether for intermediate or final products shipped between enterprises or to customers, the costs of external and internal materials used to allow the products to arrive in satisfactory condition must be allocated to the per-unit cost of the products.

Transportation. Both the cost of moving the products and the packaging materials must be allocated to the per-unit cost of the products.

Replacement parts. Management must know, based on training and experience, how the normal replacement of parts (aprons for the drafting systems of roving and spinning, drop wires and shuttles for looms, etc.) is related to units of output. Knowledge of these relationships must be used to allocate the cost of replacement parts to the per-unit cost of products. The level of these costs may be greatly affected by interest costs if loans are used to meet the needs for replacement parts.

Replacement of capital equipment. A reasonable allowance for purchase and interest costs associated with the inevitable replacement of machinery and equipment must be made. The level of these costs may also be greatly affected by interest costs if loans are used for capital replacement.

Taxes. A transparent and simple tax code is very helpful in estimating and allocating tax costs. Management must do the best it can with the knowledge it has under uncertain conditions.

Depreciation. This is usually an integral part of tax codes; however, the costing of depreciation expenses and the allocation to per-unit cost of products is also affected by other realities.

Marketing costs. These costs include sales agents and sales staff, market research and development activities, transfer of marketing and sales information, product sample preparation and shipping, etc.

Employee benefits. These include allocated costs for vacation, sick leave, down-time, severance payments, insurance, employee transportation, etc. In a low-wage country such as Ethiopia, these costs commonly exceed legal wage costs.

Board member fees and benefits. These should be costed and allocated as are other labor costs.

Employee training. This necessary expense should be budgeted and allocated as are all others. In countries such as Ethiopia, this will add significantly to production costs.

A4c. Overhead Costs

Overhead costs contain substantial "fixed" components that continue to be incurred as long as the plant legally exists. In Ethiopia, nearly all the labor force comprises a somewhat fixed cost, but this is not true for most other countries.

Examples of typical overhead costs include:

Corporate and plant management. Since human resources are necessary to re-start or expand production; they constitute a logically fixed component of a viable enterprise. Salaries and benefits for them should be allocated like other labor costs.

Electricity and water services. These will have fixed and variable cost components; both components must be allocated to the per-unit cost of product production.

General maintenance. These costs include the upkeep and repair of the grounds, buildings, and general-use equipment such as boilers, water wells, compressors, and pneumatic systems, etc. Failure to include an adequate allowance for such expenses in per-unit costs and selling prices will result in taking on debt burdens to keep the enterprise operating.

B. Spinning Operations

Spinning operations include all stages of the manufacturing necessary to transform raw fibers into yarn. These stages include opening and cleaning, carding, drawing, lap forming and combing (for some types of applications), rovin (for ring spinning only), and spinning. These will be covered in turn.

B1. Quality Measurements

To provide information on the level and control of quality in spinning operations, the team collected samples at selected plants to measure key quality indicators. The samples were carefully packaged and transported to the International Textile Center at Texas Tech University, where all measurements were made in the Materials Evaluation Laboratory. Replicated measurements were made to minimize measurement and sample errors.

These samples are identified only by plant number; the intent is not to identify specific plants but provide representative observations. Where possible, the results obtained are compared to current Uster rankings for world quality levels.

B1a. Card Sliver

Uster evenness testing (the U percent measurement) was performed on usable samples of card slivers obtained from five plants. Exhibit VI-3 summarizes the results, which show that the evenness of the card slivers is generally poor. The best result came from plant 1, where the U percent of 3.36 is so low that 50 percent of the world's textile factories produce more even card slivers than does this plant. About 75 percent of the world's textile factories produce more even card slivers than plant 2; about 80 percent have better evenness than plants 4 and 5; and almost all other factories in the world have better evenness than plant 2.

Exhibit VI-3. Results of Uster Evenness U Percent Measurements on Card Slivers from Ethiopian Textile Plants

Plant	U Percent	World Rank
1	3.36	50
2	3.68	75
3	8.37	99
4	4.84	80
5	4.86	80

Source: International Textile Center, Texas Tech University

B1b. Breaker Drawing

Uster evenness testing (the U percent measurement) was performed on usable samples of slivers from breaker or "first passage" drawing frames from five plants. Exhibit VI-4 shows that the evenness of the slivers is no better than that of the card slivers. Only one plant had a U percent that ranked in the 50th percentile, with the others ranking between 75 and 99. These U percent results therefore put Ethiopian factories in the lowest quartile of global factories.

B1c. Finisher Drawing

Uster evenness testing (the U percent measurement) was performed on usable samples of slivers from finisher (or "second passage") drawing frames from five plants. Exhibit VI-5, summarizes the results, which indicate that the evenness of the slivers remains as poor as the breaker drawing silvers. Although one plant had a U percent that ranked in the 25th percentile, three ranked in the 90th percentile or worse.

Exhibit VI-4. Results of Uster Evenness U Percent Measurements on Breaker Drawing Slivers from Ethiopian Textile Plants

Plant	U percent	World Rank
1	4.86	75
2	3.51	50
3	9.06	99
4	6.46	95
5	4.80	75

Source: International Textile Center, Texas Tech University

Exhibit VI-5. Results of Uster Evenness U percent Measurements on Finisher Drawing Slivers from Ethiopian Textile Plants

Plant	U Percent	World Rank
1	5.00	90
2	2.98	25
3	6.99	95
4	6.43	95
5	4.56	75

Source: International Textile Center, Texas Tech University

B1d. Rovin

Uster evenness testing (the U percent measurement) was performed on usable samples of rovins from six plants. Exhibit VI-6 summarizes the results, showing that the evenness of the rovins ranks somewhat worse than that of the slivers. Only one plant had a U percent that ranked in the 75th percentile. The five other plants were in the 90th percentile or worse.

Samples for plants 3 and 5 exhibited very large differences between the front and back flyer lines, indicating that some parts on the rovin machines may be badly worn or damaged.

Exhibit VI-6. Results of Uster Evenness U Percent Measurements on Rovins from Ethiopian Textile Plants

Plant	Flyer Line	Hank Roving Count (Ne)	U Percent	World Rank
1	Front	.83	7.47	90
	Back	.83	8.26	90
2	Front	.82	8.14	90
	Back	.82	8.05	90
3	Front	.83	8.90	95
	Back	.83	10.94	95
4	Front	1.10	7.43	90
	Back	1.10	7.50	90
5	Front	1.20	7.27	75
	Back	1.20	5.89	75
6	Front	1.18	12.71	99
	Back	1.18	12.24	99

Source: International Textile Center, Texas Tech University

B1e. Yarn

Usable samples of yarns were obtained from eight plants. Exhibit VI-7 shows the nominal yarn counts that plant management indicated were being spun, along with the measurements of actual yarn counts taken at the International Textile Center. In global markets, a discount is required to sell yarns with a more than +/-1.5 percent variance from the nominal (stated) count or a count exhibiting a coefficient of variation of more than 2 percent. The data in Exhibit VI-7 reveal that six of the eight yarns spun do not meet this criterion. Four of the yarns have a Uster world rank of 75 or larger; these would move into world markets only at very large discounts.

Exhibit VI-7. Results of Yarn Count Measurements from Ethiopian Textile Plants

Plant	Nominal Count	Actual Count	Count Error	Standard Deviation	Coefficient of Variation	World Rank
	(Ne)	(Ne)	(%)		(%)	
1	32\1	31.4	-1.8	0.14	0.5	5
2	32\1	29.9	-6.6	1.01	3.4	75
3	30\1	29.9	-0.3	0.66	2.2	50
4	40\1	39.5	-1.3	0.11	0.3	5
5	40\1	38.3	-4.3	1.56	4.1	95
6	38\1	38.6	+1.6	0.87	2.3	50
7	14\1	14.3	+2.1	1.30	9.1	100
8	16\1	16.6	+3.8	0.39	2.3	75

Source: International Textile Center, Texas Tech University

Uster yarn evenness testing was performed on each yarn. Measurements included the coefficient of variation (CV), thin places per km, thick places per km, and neps per km (Exhibit VI-8). The results confirmed the fears of the technical team members. More than 80 percent of the yarn quality measurements received a rank of 95; in other words, 95 percent of all textile factories worldwide produce yarns superior to Ethiopian yarns. The remainder of the measurements received a ranking of 75. In the CV measurements, all yarns received a ranking of 95.

The quality of yarn output was inconsistent in some cases. One case, illustrated in Exhibit VI-9, occurred in plant 8. Out of ten replicated measurements taken with the Uster yarn evenness tester, three (numbers 6, 7, and 8) exhibited a much greater unevenness than did the other seven. The average of all ten provide the data in Exhibit VI-8, but the average of only the best seven measurements in Exhibit VI-9 is much more favorable for yarn measurements. For example, the CV is changed from 18.1 percent to 15.7 percent, which changes the Uster world ranking from 95 to 50. Such inconsistency is not attributable to inadequate equipment; rather, it is usually due to inconsistent material handling and machine operator practices.

Exhibit VI-8. Results of Uster Yarn Evenness Measurements from Ethiopian Textile Plants

Plant	Yarn Count	Coefficient of Variation		Thin Places / Km		Thin Places / Km		Neps / Km	
	(Ne)	(%)	(Rank)	(No.)	(Rank)	(No.)	(Rank)	(No.)	(Rank)
1	32\1	22.9	95	495	95	1,492	95	626	75
2	32\1	19.7	95	147	75	871	75	707	75
3	30\1	23.4	95	526	95	1,336	95	844	95
4	40\1	23.8	95	730	95	1,694	95	1,137	95
5	40\1	25.8	95	712	95	1,759	95	1,014	95
6	38\1	22.1	95	424	95	1,434	95	948	95
7	14\1	20.8	95	106	75	693	95	380	95
8	16\1	18.1	95	353	95	627	95	205	75

Source: International Textile Center, Texas Tech University

Exhibit VI-9. Results of Replicated Uster Yarn Evenness Measurements from Plant 8

Replication	Coefficient of Variation	Thin Places/Km	Thin Places/Km	Neps/Km
	(%)	(No.)	(No.)	(No.)
1	-15.31	0	120	89
2	15.19	2	136	101
3	15.26	0	144	95
4	16.41	9	150	77
5	16.06	7	131	73
6	23.53	431	554	88
7	23.03	448	516	73
8	24.81	514	509	67
9	15.60	0	123	83
10	15.70	2	126	76
Overall average	18.09	353	627	205
Avg. of best 7	15.65	7	332	212

Source: International Textile Center, Texas Tech University

Measurements were also taken of the breaking strength of the eight yarns sampled from these plants (Exhibit VI-10). The yarns from plants 3, 4, 5, 6, and 7 are quite weak. The breaking load CV is also very high in these yarns; in fact, all CVs are too high and should be below 10-11 percent.

Exhibit VI-10. Results of Uster Single-end Break Tests on Yarns from Ethiopian Textile Plants

Plant	Yarn Count	Breaking Load	Coefficient of Variation	Tenacity	Elongation
	(Ne)	(g)	(%)	(g/tex)	(%)
1	32/1	295.8	12.9	15.8	5.8
2	32/1	350.4	11.5	17.7	5.4
3	30/1	263.1	15.7	13.3	5.8
4	40/1	193.4	14.2	12.9	5.5
5	40/1	198.5	19.4	12.9	5.4
6	38/1	207.5	15.3	13.6	5.5
7	14/1	584.3	18.4	14.0	7.3
8	16/1	609.1	13.2	17.1	6.0

Source: International Textile Center, Texas Tech University

B2. Opening

Most plants do not have automatic bale feeders. This is not a fundamental problem if enough laborers could be applied to the task and take adequate care to properly open and blend the bales of cotton used in a mill lay-down. In all cases, however, the operators pulled large wads of cotton out of the bales, then pulling them from both sides in a tearing fashion, before loading the cotton on the lattice conveyor apron or the hopper of the feeder. This method will certainly break some fibers, resulting in a shorter staple length and increased short fiber content. Automatic feeder systems catch the fibers on one end only and slide the fibers out of the bale. This gentler process should be used by the people involving in opening the cotton.

In discussions with personnel at the plants, this rough opening procedure was justified with the explanation that it reduced the number of wraps and chokes that occurred on the doffer roll of the lifting spiked apron. Their observations may be accurate, but it is a costly short cut that should be avoided. The problem with wraps and chokes should be remedied by adjusting the equipment properly.

Automatic bale feeders and other opening and cleaning equipment are more robust and less temperamental than most textile machinery. Aside from scheduled cleaning and lubrication, relatively minor adjustments and a little maintenance will keep this equipment in top condition. Still, keeping it clean, properly lubricated, and maintained is important. The following situations should be addressed:

- All spikes on lift aprons, beater lags, and doffer rolls should be kept as free of nicks and hooks as possible, thereby preventing an elevated short fiber content. Sampling of the lint cotton at each opening room indicates that the staple length of the cotton fibers is marginal for many of the yarn counts produced; therefore, increasing the number of short fibers should be avoided if at all possible.

- Several opening beaters on pickers exhibited badly damaged lag sections, which also contributes to fiber damage. In at least one instance, plant personnel were aware of this problem and had replacement lags in the store, yet they made no effort to replace them because the picker was running and making its lap. This situation would certainly cause problems in subsequent processing stages, however.

- Air ducts are not checked frequently enough and are not adequately cleaned of accumulated fibers, trash, and dust. Pneumatic systems should operate consistently at near maximum efficiency.

B3. Carding

The carding process is critically important to spinning performance and yarn quality but is one of the most neglected processes in Ethiopian factories. Carelessness seems to be the biggest single problem, as reflected by the following conditions:

- The settings for the undercard screens are generally incorrect and variable. The screens are not handled carefully when removed for cleaning and reinstalled, as evidenced by their damaged appearance.

- The card flats are often loaded with excessive lint, leaf, and seed coat particles (which also indicates poor ginning).

- The flats are generally not as sharp as needed to do a high quality job.

- Frequently damaged doffer wire is due primarily to carelessness in cleaning the area around the doffer and crusher rolls.

- Crusher roll settings vary from side-to-side. These do not normally get out of adjustment easily, so they must have been ignored for long periods.

B4. Drawing

The high percentage of drawframes equipped with automatic leveling devices (autolevelers) is impressive. It is a pity, however, that few of them are operational. The reason why is consistently given as an electronic problem, but the most prominent factor is the variable, unreliable electrical supply to the factories which indicates the importance of a developed infrastructure to running a modern factory.

Significant and common maintenance problems observed include the following:

- Operators are negligent in clearing out the pneumatic cleaning systems for the drawing equipment, resulting in the pass through of unwanted lint, trash, and other debris detrimental to efficiency and quality.

147

- The coverings of top drafting rolls are allowed to wear too much before they are recovered; this adversely affects the evenness of the yarns produced. Weekly washing of the roll covering when processing 100 percent cotton should also be standard operating procedure; this procedure should be performed on a daily basis when processing blends of polyester and cotton, and once a shift when processing 100 percent polyester.

B5. Lap Forming and Combing

Very little combing equipment was operated during visits to the factories, and no one expected to use them in the near term because of lack of demand and/or a lack of polyester to blend with combed cotton.

Inspection of idle machines did reveal that the covered top rolls tended to be in poor condition. Also, top combing bars tended to be worn too much to do the job without damaging fibers. On one of the rare combing machines that was running, the timing of the piecing cycle needed adjustment.

B6. Rovin

A chronic and serious error is operating rovin spindles with missing aprons on the drafting system. Spare aprons should be kept on each roll stand section to replace damaged or broken aprons. Furthermore, avoiding excessive apron breaks requires (1) daily routine cleaning of the drafting system by the operators, and (2) a program for more vigorous cleaning, or "scouring." The frequency of scouring depends on raw material and operating conditions, but it should be done at least every six months. One factory indicated that it was done about once a year. Two men working at a normal pace can scour a rovin frame in about four hours, including the task of servicing the top rolls and aprons.

Most rovin frames are equipped with double-apron drafting systems. Improper spacers are used for the rovin counts produced. Also, the twist multipliers used for the rovin appear to be incorrect for the operating speeds and drafting systems used in the spinning processes. These should be checked and corrected if necessary.

Another chronic maintenance problem is the failure to replace grommets on the top of the flyers. If a grommet is missing, or has a significant build up of dirt and waxes, the associated position on the rovin frame will likely have inadequate tension, resulting in bobbins that are too soft.

For unknown reasons, there were relatively more rovin frame positions out of production due to a lack of minor spare parts. This condition will unbalance operating capacities within the plant and should not be allowed to occur.

B7. Ring Spinning

A positive observation is that practically all ring spinning frames in Ethiopia, regardless of their manufacturing date, are currently equipped with state-of-the-art drafting systems, which are capable of producing first-class yarn. The age of the basic frame is not critical; rather, it is the ages and types of drafting systems, spindles, creel holders, and the maintenance that are critical.

149

Maintenance pays big dividends anywhere, but especially in a country with low labor costs such as Ethiopia. In calculating costs, completely new equipment must be depreciated on the balance sheet, greatly increasing the capital cost of manufacturing for the first few years. Careful upgrading of existing equipment, accompanied by excellent maintenance, keeps these costs down. Decisions to purchase new capital equipment should be based on the emergence of new technology or on the changing cost structure and market positioning of the enterprise. In Ethiopia, these were not prime considerations in purchasing the ring spinning equipment

If an Ethiopian enterprise were to target a higher level domestic or export market for ring-spun yarns, it would probably have to install a *bona fide* air conditioning system to control temperature and relative humidity simultaneously. Such a system does not currently exist anywhere in Ethiopia, and would require a much higher level of capital investment to achieve. Furthermore, it would be inappropriate to attempt to do so until reliable electrical supplies are available.

The ring spinning equipment in Ethiopia is in pretty good condition. Only one ring spinning operation was observed to be too deteriorated to give adequate service.

Unfortunately, most plants visited have idle spinning capacity. Managers at some plants are stripping the idle frames to provide spare parts for others in operation. This practice renders some still valuable machinery to the status of junk; continuing to list it on balance and other data sheets is a questionable practice. Furthermore, this idle equipment compounds maintenance problems. It should be at least covered (e.g., with plastic sheeting) and periodically cleaned to avoid contaminating functioning equipment with lint and dirt.

The twists applied to various yarns are not necessarily the best for the performance of the spinning frames or the fabric produced. It is unclear how managers determined which twist factors to use, but they did not appear to vary much from one yarn to another. The following points should be kept in mind:

- Dual determinants of optimum twist are yarn *breaking strength* and yarn *elongation*; neither taken alone will suffice. (This is also true for optimizing the tensor spacing.)

- If the same yarn size is used for weft and warp yarns, different twist multipliers may be required for the weft than for the warp to give the desired feel or hand to fabrics woven from them. Alternatively, to avoid mixing yarns with different twists, one of the yarns may be sized slightly lighter or heavier (e.g., by one-half Ne).

Significant variations in twist multipliers were noted in some operations. This problem is not manifested as quickly in ring spinning frames equipped with tangential belt drives as it is in those frames with four spindle tape drives. Nevertheless, with sufficient wear, the tangential belt drive will also manifest this problem. More careful monitoring is warranted and requires regular use of a stroboscope, but few if any of the factories have functioning stroboscopes.

Other problems encountered included:

- Using a power factor meter, differences of more than 20 percent were detected in the electric power demand of similar type frames running at the same speed on the same yarn count. This is likely due to motors that are rewound in the factory's shop without care to control the gauge and type of wire used or the number of coils in the wind.

- Instances of receipt of defective parts were observed; while this can happen anywhere, plant management must be able to detect defective parts and be willing to require that suppliers provide good parts.

- During the spinning frames' frequent stops, it was noted that stopped frames still had pressure applied to the top weighting arms. If the frame is to be stopped for very long (e.g., for longer than a single shift), the pressure should be released.

Finally, a good, consistent spinning operation requires the effective use of overhead cleaners. Some spinning departments visited did not have overhead cleaners or they were not operational. In others, the output nozzles of the cleaners were missing or improperly placed to clean key sections effectively (such as the creels) of the frames. In addition, the maintenance of the overhead cleaners was especially poor.

B8. Open-End Rotor Spinning

The technical team saw only one example of open-end rotor spinning in Ethiopia, which was at the Arba Minch Textile Factory. This provides a striking example of the failure to obtain the technology needed to produce the types of yarns targeted. The technology is 25 years old and is appropriate for only a limited number of yarn products such as very coarse counts of yarn and medium-denier acrylic soft twist yarns. It is quite inappropriate, however, for cost-effective production of medium-count yarns. There are two major shortcomings:

- The spin box is not designed to operate at speeds above 45,000 rpm. Modern open-end rotor machines operate in excess of 100,000 rpm.

- The machine lacks an effective self-cleaning system, which has been common on other rotor machines for years, requiring that the spin box be cleaned often to produce a quality yarn.

With these disadvantages, management has little choice but to find market niches that can be effectively supplied by these machines and concentrate on getting as much efficiency from them as possible.

B9. Winding

Winding equipment is a real problem for the textile sector; one that demands attention. The team observed the following:

- Inconsistent package densities (either too soft or too hard) are common and cause multiple problems in subsequent processing steps. It is standard operating procedure in any well-run factory for the operators and supervisory technicians to check (by touch) the package firmness on the various spindles periodically. No evidence indicated that this was done at any of the factories; rather, if the package filled up without stopping, it is assumed to be adequate. For package yarn dyeing, these variable densities become crippling, whether they occur within or between packages.

- It is apparent that splicers and knotters are serviced only when they fail totally, a costly practice that not only affects the winding operation but contributes to excessive stops in subsequent processes such as doubling, twisting, warping, slashing, and weaving.

Splicers and knotters should receive daily inspections under a regimen of preventive maintenance.

Winders are not difficult machines to operate and maintain. Some basic training and insistence on cleaning in this area would bring substantial efficiency gains.

The winders at Arba Minch, like the rotor spinning machines there, exemplify the problem of installing new machinery that embodies obsolete technology (see discussion in Annex J).

B10. Doubling and Assembly Winding

All observed departments for doubling and assembly winding were quite unkept, with dirty guides and tensioning devices evident everywhere. Also, a tension variation in the range of fifty grams was measured using the tensiometer. For high quality yarns, this variation must be kept to two grams or less. This problem is so bad that twisted yarns look as if they are core-wrapped yarns.

B11. Twisting

This section will focus on two-for-one twisting because most plants were equipped with this. Excessive variations in twisting were made apparent by measurements with a stroboscope. Also, using a hand-held tachometer, discrepancies were found between the actual speeds and the speed indicated by the machines' tachometers.

A likely source of the twist variations measured is defective top draw roll coverings. A scheduled maintenance program to buff and replace these rolls is needed.

C. Weaving Operations

C1. Warping

Many of the failures obsérved in the winding, doubling, and twisting operations show up as problems in the warping, which contribute to rough and poorly formed beams. Additional problems in the warping area follow:

- In some cases, the layout of the creel is incorrect, resulting in a misalignment of some pirn sections. This causes tension variations that show up as high and low spots on the beams.

- In almost every case, lint, trash, natural waxes from the cotton, and/or shedding from polyester finishes have built up on the tension washer discs.

- Some operators crossed ends behind the reeds and/or adjusted the width of the expander comb improperly. (It was repeatedly observed that the operators took an unusually long time securing the warp ends to the new beam, yet this activity had little effect on the build of the beam. This time would be better spent checking the ends in the dents of the comb.)

C2. Slashing - Sizing

There was little evidence that attention was given to the gauges indicating dry can and size box temperatures, take-up speeds, moisture percentages, or yardage counters (Smit markers). All of these must be used to ensure a well-prepared beam for weaving.

It seemed quite common to run slashers more slowly than the manufacturer's recommendations. The most common explanation was low steam pressure (due to a boiler being out of service or too small or having been blown down, etc.). Further inspection revealed problems such as steam leakage at rotary joints and a lack of condensate traps with returns.

There were no heat and hot water recovery systems. While these systems require an initial investment, they actually lower costs within a short time by savings in fuel expenses. They also help stabilize the temperatures in equipment such as size boxes and dye ranges.

These problems contribute to a tendency to wind yarns onto warp beams that are not adequately dried. It is imperative that the temperature of the drier be maintained within a close range (within plus or minus two degrees centigrade) and that operating speed be kept constant, if the yarns are to pickup the right amount of size and dry correctly.

C3. Weaving

All previous processing problems reveal themselves at the weaving loom, resulting in lost production and poor fabric quality. Additional problems noted at several plants include:

- An excessive number of exposed rings due to broken and lost ends is evident in most plants, indicating that weavers are not required to perform their duties comprehensively.

- Weavers often do not patrol the looms but rely on signals from the knock-off indicators or on simply spotting stopped looms. Patrolling should be standard operating procedure. (In some cases, the looms are operated with the automatic knock-off system partially disabled. This is a poor practice even with an abundance of people in the area.)

- Looms were frequently noted with practically full beams on them, yet they had been stopped for some time (probably weeks), indicated by the collection of dirt and other debris on them. A productive operation does not waste a beam of warp yarn by leaving it on a loom that cannot be repaired expeditiously.

D. Dyeing and Finishing Operations

Among the problems common to most dyeing and finishing operations in the textile sector is the failure to maintain properly the vulcanized rubber squeeze rolls on machines such as washing and scouring machines, mercerizing machines, tenter frames, pad dyeing machines, shrinkage control machines, dryers, and fabric printing machines. Approximately 90 percent of all rolls observed, regardless of the age of the plant or its equipment, operated with rolls that should have been at the least reground or possibly replaced. Otherwise, the squeeze rolls will not deliver even pressure across the surface, causing a variation in the amount of liquid removed along the width of the fabric. If the roll is used at the pad dye machine, the result will shade the fabric from side to center to side due to the amount of dye left in different parts of the fabric. Similar results will also afflict printed fabrics.

A common practice throughout the finishing departments is to use a cold mercerizing process. This necessitates the use of a refrigeration system to keep the temperature of the caustic at the desired level during mixing because the caustic mixing process itself generates heat. In Ethiopian circumstances, a better approach may be to use a so-called hot mercerizing process because this would eliminate the need for expensive chillers during mixing. The hot system also uses a slightly lower level of caustic concentration, which reduces input costs. In addition, the hot system has proven to operate at a higher capacity. For these reasons, it has become the preferred process in the United States.

A curious practice observed in Ethiopia is the singeing of polyester and polyester blend fabrics. This would promote the formation of a minute, hard ball on the end of each individual polyester fiber, which would interfere with the dyeing process. This practice is very risky.

Steam is expensive to generate and should be used to its maximum potential, yet we observed plants executing boiler blow-downs (flushing out the steam tubes with fresh water) as frequently as once a shift. Water treatment would be far less expensive and detrimental to the steam lines and wet processing equipment, if the water is in fact this hard. Evidence suggests that frequent blow-downs are is a carry-over from when the plant could not adequately soften the water to protect the tubes. If so, this practice should be discontinued. A once-a-week blow-down, perhaps when the plant is stopped for the weekend, should be adequate.

Finally, steam traps are needed at the dryer cylinder inputs. These would save energy because the hot water could be returned to the boiler, thereby reducing energy input needed to keep the steam pressure at the desired level. Currently, the steam is released into the plant, causing additional ventilation problems in the working area.

E. Inspection and Quality Control

Fibre and yarn testing laboratories are not well equipped; even those with better equipment are not well utilized. Fiber properties of the cotton appear to be quite variable and not high quality; therefore, a better assessment of the fibres and better blending of the lay-downs in the opening room could greatly improve processing performance. No one checks to determine whether additional damage is done to fibre properties by the processing equipment. Neither are there procedures for monitoring yarn quality effectively.

Quality control inspections are normally done on greige and finished fabric; however, this was not generally part of an active quality control program. Inspection of greige fabrics chronically lags behind its production, in spite of the fact that current production is well below capacity. Inspection of finished fabrics should be done on a timely basis. In neither case is systematic feedback about defects built into the process, resulting in no attempt to correct the defects found.

Most fabrics produced by Ethiopian factories should have a good surface appearance to please consumers. Transmitted light is the appropriate method to use in inspection, yet most greige fabric inspection is performed using illuminated panels. This method determines structural problems (such as cloth density), but these may not be a concern to consumers. Both inspection techniques should be used, but in the Ethiopian context inspection by transmitted light may be the most useful.

Fabric strength tests are not done, either for finished fabrics or greige fabrics. Neither are pilling tests on cotton/polyester blend fabrics. The capability to do both tests will be necessary to reach consistently high quality levels, as well as satisfy the requirements of many export markets.

Most color laboratories are poorly equipped to meet commercial quality control and product development needs; even those that are better equipped are not used aggressively. Laboratory consistency requires automated, calibrated instruments (that are increasingly computerized). All color matching is currently done by visual inspection and is not dictated by the customer, a situation that will have to change if export markets are to be developed. While crocking and washing tests are common, light-fastness tests such as those with a xenon arc instrument are not. This capability is also necessary in the global market.

F. Water Treatment and Boilers

F1. Water Treatment

The treatment capacities for water supplies to the factories are generally adequate. However, the same cannot be said about the effluent treatment systems, which are almost non-existent.

Caustic recovery systems, except for at least one which is in the development stage, are almost non-existent. These would be beneficial from an environmental standpoint. They also offer the capability of achieving substantial savings through reduced purchases of new caustic supplies.

F2. Boilers

Maintenance of the boilers was above average, compared to the rest of plant maintenance. The same can be said for operator training.

A common complaint is that the boilers are either too small or not performing adequately. However, observations indicate that incorrect fuel-to-air ratios are used, resulting in excessive fuel use and sub-optimum heat generation. If this problem were systematically examined and corrected, the efficiency of some boilers could increase 20 to 30 percent in capacity.

G. Garment Manufacturing

Production of garments primarily involves cutting and sewing. This can be efficiently and competitively done using a much lower level of technology than is possible in modern textile manufacturing. The key requirement is low labor costs per unit of garments produced.

G1. Productivity and Plant Capability

The productivity of the four public sector garment factories is low. Using men's shirts as an example, the average production per operator per work shift in Ethiopia is five to seven shirts. In other less developed countries that have cutting and sewing machinery comparable to Ethiopia, such as Guatemala, the average production is 22-26 shirts per operator per work shift. This number is higher in the United States, due to the use of more sophisticated machinery and equipment, including a substantial amount of robotics technology.

Garment factories in Ethiopia are, however, manufacturing some complicated clothing such as work suits, fatigue jackets, and men's shirts. These capabilities can be translated into a multitude of export products, from the same dress shirts they are currently producing to ski jackets similar to other jackets already made. The fabrics and trim may not be available in the local market, but international partners could provide these inputs.

G2. Buildings, Machinery, and Equipment

The buildings are generally adequate for the machinery and equipment installed; warehouse space is relatively abundant. A reliable electricity supply is sorely lacking; however, this shortcoming is not nearly as damaging to the efficiency of garment manufacturing as it is to the textile manufacturing operations of spinning, weaving, dyeing, and finishing.

The cutting machinery used in the four plants is generally adequate and well maintained. The only significant problem noted was a multiplicity of brands used in one plant; this entails a higher inventory of spare parts, which is a disadvantage in Ethiopia. The spreading machines were high quality, semi-automatic machines which were in good condition. In some instances, cutting needed to be leveled more exactly.

Sewing machines are also generally adequate and well maintained. The most common machine is the manual Juki single-needle machines with back tackers; these machines are a standard in the industry and will last a long time. Generally, they are mixed with Juki safety stitch machines and Brother specialty machines. All of these are adequate. In some cases, there is a mix of machinery due to gifts made by machinery suppliers to the Ethiopian garment sector. The disadvantage of this is the need to keep a larger spare parts inventory.

Almost no specialty folders are used to enhance the efficiency of sewing operations. An exception is found in center front placket construction, where some folders are used.

Special folding tables are used in shirt factories. The Nazareth Garment Factory has vacuum tables, which enables much better quality control in the packaging of the garment. Nazareth was also the only factory where all stitching appeared to meet export standards.

While machinery maintenance is adequate, mechanics need technical training to be able to adjust the machinery so the operator can efficiently run it. For example, clutch and treadle adjustments can optimize the efficiency of the machinery. Garment factory mechanics should facilitate the interaction between machinery and operator, in addition to ensuring that the machine runs well. Operators also need to be trained in similar adjustments, such as keeping good needles in place, not interfering with proper thread tension, maintaining the proper placement of the thread stand, etc.

G3. Quality Control

One aspect that will have to be improved if the garment factories are to supply more demanding markets is quality control. No evidence was seen of specification sheets or measuring tools for line inspectors to use to track the consistency of the products produced by cutting and sewing lines; nor were there audits of specific cuts at the end of the line or in the finishing department. No monitoring of cutting activities occurred to ensure that the material was not wasted. These simple quality control tools need to be employed and incorporated into the daily management of garment production.

SECTION VII

SYNTHESIS AND ANALYSIS OF OPTIONS

PREVIOUS PAGE BLANK

SECTION VII
SYNTHESIS AND ANALYSIS OF OPTIONS

A. Financial and Technical Assessments of the Enterprises

The dire condition of the public cotton textile sector is well illustrated by the information summarized in Exhibit VII-1. Almost all the enterprises exhibit a negative or nearly negative net worth. Only the Debre Birhan Textile Factory and the Nazareth Garment Factory have significantly positive net worth values. Furthermore, all but one enterprise, the Nazareth Garment Factory, have a very high debt load; i.e., the total debt of the enterprise is greater than the net worth of the enterprise. The relatively better financial situation of the Nazareth Garment Factory only reflects the fact that it was the last enterprise established—in 1992—so that it has not had enough time for unprofitable operation to deplete its total assets. Taken as a whole, however, the public cotton textile sector is bankrupt.

The technical assessments summarized in Exhibit VII-1 provide guidance about the use-value remaining in the machinery and capital equipment within these enterprises. Those installations rated as good (G) have use-values that would interest someone wanting to manage the enterprise for a profit; a rating of very good (VG) is desirable from a technical standpoint. Anything rated as very poor (VP) would hold no interest to an owner or manager required to make a profit from the enterprise.

Predominantly good technical ratings are given to Arba Minch Textile Factory, Awasa Textile Factory, Debre Birhan Textile Factory, Kombolcha Textile Factory, Edget Yarn Factory, Akaki Garment Factory, Addis Garment Factory, Nazareth Garment Factory, and Middle Awash Agriculture Development Enterprise. Therefore, if the debt burden of these were absorbed and forgiven, these enterprises would have a positive monetary value in an open market. The exact value of the enterprise would depend on how profitable prospective owners and managers believe it to be.

Predominantly very poor technical ratings are given to Adei Abeba Textile Factory, Akaki Textile Factory, Dire Dawa Textile Factory, Nefas Silk Sewing Thread Factory, Abobo Agriculture Development Enterprise, and North Omo Agriculture Development Enterprise. Therefore, even if the debt burden were removed from these enterprises and the business regulatory environment made favorable, potential owners and managers aiming for profitable production would certainly prefer to begin with a new enterprise. These very poor enterprises would have little or no value in an open, competitive market. Prospective owners and managers would be interested only in the location, the buildings, the feasibility of establishing another type of business there.

Not summarized in Exhibit VII-1 are the technical ratings for the acrylic spinning operation in Dire Dawa, the knitting operation in Adei Abeba, and the sock knitting operation in Akaki. A good rating goes to acrylic spinning at Dire Dawa and to the knitting at Adei Abeba. A fair rating goes to the sock knitting at Akaki.

With the possible exceptions of the Debre Birhan Textile Factory and the Nazareth Garment Factory, the government could only sell these enterprises at a net loss; i.e., the liabilities accruing to the government are greater than the enterprise values. Furthermore, even

Exhibit VII-1. Key Financial and Technical Indicators for Cotton and Textile Enterprises

Enterprises	Financial Indicators		Technical Indicators					
	Net Worth	Debt Load	Spinning	Weaving	Dyeing & Finishing	Cutting & Sewing	Farming	Ginning
Integrated Textile Manufacturers								
◻ Adei Abeba Textile Factory	N[1]	VH	VP	VP	VP	--	--	--
◻ Akaki Textile Factory	N[2]	VH	VP	VP	VP	--	--	--
◻ Arba Minch Textile Factory	Q[3]	VH	G	G	--	--	--	--
◻ Awasa Textile Factory	Q[3]	VH	G	G	G	--	--	--
◻ Bahir Dar Textile Factory	N[1]	VH	F	VG	VP	--	--	--
◻ Debre Birhan Textile Factory	P	VH	G	G	G	--	--	--
◻ Dire Dawa Textile Factory	N[1]	VH	F	VP	VP	--	--	--
◻ Kombolcha Textile Factory	Q[3]	VH	G	G	F	--	--	--
Yarn Manufacturers & Finishers								
◻ Edget Yarn Factory	Q[3]	VH	G	--	G	--	--	--
◻ Nefas Silk Sewing Thread Factory	N	VH	--	--	VP	--	--	--
Garment Manufacturers								
◻ Akaki Garment Factory	Q[3]	VH	--	--	--	G	--	--
◻ Addis Garment Factory	N[1]	VH	--	--	--	G	--	--
◻ Gulelie Garment Factory	N[1]	VH	--	--	--	F	--	--
◻ Nazareth Garment Factory	P	M	--	--	--	VG	--	--
Cotton Producers								
◻ Abobo Ag. Dev. Enterprise	N	VH	--	--	--	--	VP	F
◻ Middle Awash Ag. Dev. Enterprise	N	VH	--	--	--	--	VG	G
◻ North Omo Ag. Dev. Enterprise	N[1]	VH	--	--	--	--	VP	P
◻ Tendaho Ag. Dev. Enterprise	N	VH	--	--	--	--	F	F

Key: N = negative; Q = questionable; P = positive; VH = very high (debt greater than net worth); M = moderate (debt between a third and a half of net worth); VP = very poor (not suitable for repair); P = poor (needs renovation and/or upgrading); F = fair; G = good; VG = very good (only normal maintenance needed).

[1]Artificially inflated by asset revaluation.

[2]Inflated asset values.

[3]Expected to be negative within a year or two.

Debre Birhan and Nazareth are very close to break-even situations for the government because the net income potential of these enterprises will not justify higher selling prices. It would be a fundamental error to assume otherwise and perpetuate ever-increasing debt levels. Re-capitalization of depleted enterprises would not generate enough net revenues to pay for the expense of re-capitalization; therefore, financial conditions would continue to deteriorate. The only effective way to increase the value of these enterprises (for either selling or operating them at a profit) is through deregulation, policy adjustments, changes in laws, etc., which will make it feasible for the enterprises to compete.

All phases of the textile operations that received technical ratings of very poor are clear candidates for dissolution. Given the severe textile manufacturing overcapacity—with regard to the size of the market and the amount of domestic cotton available to the textile industry—the dissolution of these enterprises would not adversely affect Ethiopian consumers. Rather, it would make it possible for the remaining textile enterprises to increase capacity utilization; this is a prerequisite for achieving positive net revenues. The most likely result of re-capitalization of dilapidated enterprises, even if accomplished with donor money, will be to lower the chances of success for other enterprises. While the remains of the dissolved enterprises might be used, they would have to be dissolved to free them from other liabilities, including labor, that would preclude interest in using them productively.

Textile enterprises with mixed technical ratings (e.g., Bahir Dar and Dire Dawa) could possibly be down-sized and restructured to continue operating the useful machinery and equipment. Thus, Dire Dawa might become a yarn manufacturing enterprise, while Bahir Dar might concentrate on weaving. For the reasons noted above, investment to re-capitalize the poor parts of a public sector textile operation cannot be expected to generate returns adequate to repay the investment and would decrease the opportunity for success by other public sector textile enterprises.

All available evidence leads to the conclusion that previous investment in the textile sector is already lost; the major question is now how this loss will be absorbed and reconciled. Two approaches are possible:

- Use public monies (from domestic or foreign donor sources) to re-capitalize public sector enterprises, thus retreating to a centralized, bureaucratic approach.

- Use public monies to absorb the losses and provide severance benefits for employees, while allowing the public sector industry to shrink and a new textile industry to grow.

Ethiopia has taken some steps toward an open, competitive environment for textiles to benefit the country's 57 million consumers. However, this has exposed the domestic cotton textile sector to the consequences of inefficiency and mismanagement. To move forward, the public textile sector now needs down-sizing substantially.

B. Five Major Policy Options

Five major policy options may be pursued relative to the public sector cotton textile enterprises in Ethiopia; these involve privatization, exports, domestic fabrics, garments, and isolationism. Currently, none is being pursued coherently, nor can they be under current national economic and industrial structures. As research for this report progressed, it became increasingly evident that the most significant causes of the industry's current malaise and the barriers preventing progress are outside the control of the enterprises. They are even outside the portfolio of PESA because they are rooted in macro-economic and legal policies that cut across ministries to the office of the prime minister. Five options are discussed below.

B1. Accelerate the Pace of Privatization

An overt policy of removing the textile industry from the public sector is the first step in ensuring private investors that the government will not be a partisan force in the industry. Failure to move decisively toward dissolution is the same as failing to move decisively toward privatization. A privatization program is not convincing unless it is clearly an "exit strategy" used by the government. To exit the industry, the government must focus on meeting its responsibilities as stated or implied in Public Enterprise Proclamation No. 25/1992. It will have to clear debts, meet basic social responsibilities to workers, dissolve selected enterprises, etc. Off-loading these responsibilities onto private sector investors would be tantamount to continuing government interference in private enterprises. No rational investor would accept these pre-existing responsibilities without receiving a special deal from the government; everyone would know that *bona fide* privatization was not the objective.

To successfully privatize, the government must handle large net liabilities, primarily in debt resolution and worker compensation. Thus, even the enterprises that have a potentially positive market value do not have potential to provide the government enough revenue to offset the costs associated with privatizing the entire cotton textile sector. Some enterprises will have to be dissolved at great cost with very little revenue possible from sale of assets. This case could easily be stated to international donor and lending agencies; therefore, straightforward assistance to meet the costs associated with *bona fide* privatization could be arranged.

The following describes some of the critical barriers to successful privatization.

Persistent government manipulation. Government deals that arbitrarily change the private enterprise will sabotage the privatization process. This is illustrated by a recent government offer to guarantee a Universal Leather Factory buyer a supply of hides from public sector leather tanneries. If the sale were made on this basis, it would demonstrate that the government is willing to dictate to whom businesses can buy and sell. The government seems willing to replace a near-monopoly under direct government control with a private monopoly that has *de facto* control of the country's existing input supply and over which the government supposedly has no control. If carried through, such an action would probably destroy private sector leather factories and prevent other investors from entering the business.

Rigid currency controls. The harder it is for investors to get money out of the country, the less likely they are to invest in the country. Maintaining arbitrary control over the value of Ethiopian currency is to impose *de facto* arbitrary control over the value of investments in Ethiopia. Allowance of market-based currency values and freedom to move currency will reduce uncertainty and increase the value of investments in Ethiopia.

Lack of property and contractual rights. The investment values of enterprises are greatly reduced by the inability of private owners to own land; this is worsened by the lack of legal recourse to remedying arbitrary government decisions that may be taken with respect to land-use. Similarly, the uncertainty that arbitrary decisions may be made about customs procedures, transportation schedules, and energy availability makes private investment much less attractive.

Unlimited bank overdrafts. The Commercial Bank of Ethiopia is apparently extending unlimited overdraft funds to public sector cotton and textile enterprises. This continues to escalate the government's debt liability and reduces the potential market value of all other textile enterprises. Removing the most inefficient production capacity would make it easier for the remainder to be operated at a profit. Removal of non-economic production would reduce the risk faced by prospective buyers of other production facilities, which would raise the market prices of other enterprises.

Pro-labor, anti-business environment. A severance arrangement with workers must be actively explored, as well as a willingness to discipline workers. The situation is well illustrated by the well-known labor riot at the Awasa Textile Factory and the failure to hold workers responsible for their actions. Unless such disputes are handled within the rule of law, potential private investors will become hopelessly discouraged.

In summary, moving deliberately and effectively toward privatization would require overt development of an investor-friendly environment in Ethiopia. Prerequisites would be timely debt forgiveness and labor severance packages, along with liberalization of labor market controls, customs procedures, communications regulations, and currency controls. Privatization would require a realistic valuation of each enterprise, including the fact that some would not sell at all before dissolution. The government must be prepared to accept large paper losses.

B2. Expand Export Markets

The cotton textile industry is now operating at less than 50 percent of its estimated capacity with fabric exports accounting for less than 2 percent of total textile output. Even if garment exports were added, this wold not raise total textile exports above 4 percent of total textile output. Therefore, exports currently account for less than 2 percent of estimated capacity. Raising this level in the near term has probably been precluded by failures to perform this year; thus, the Nazareth Garment Factory and the Adei Abeba Garment Factory have lost their export outlets, while the Kombolcha Textile Factory failed to meet quality requirements on a critical export test sale. Even if the Awasa Textile Factory is successful at building on the export business it is now developing, the total textile and apparel exports for the industry are likely to decline in the near term.

There are no foreseeable circumstances under which current management can hope to increase exports enough to forestall a complete financial collapse of the industry. Until downsizing removes the most egregious excess capacity, further investment in new plants or equipment holds little or no prospect of making adequate returns. Indeed, the plans for a new textile factory in Tigrey, which is intended to exploit export markets, will likely exacerbate the industry's problems.

The following describes some critical barriers to the development of export markets:

Rigid currency controls. Ethiopia's currency controls are among the most rigid in Africa. With the globalization of textile industries, rigid currency controls are especially damaging. Access to hard currencies is restricted for potential exporters, which raises the cost of foreign sales and lengthens transaction times. This puts Ethiopia at a comparative disadvantage to most export competitors.

To make matters worse, Eritrea's use of the Ethiopian Birr has created a currency grey market, enabling those with extraordinary connections to circumvent rigid controls. This undermines the Ethiopian government's control of currency transactions and fosters unequal access to currency-sensitive activities such as exporting.

Customs Service bureaucracy. The Customs Service of Ethiopia continues to function with the anti-business ideology that has dominated in Ethiopia for the last 40 years. Prerequisites for effective competition in export markets, such as importing man-made fibers and meeting strict timetables for delivery, cannot be met by a domestic textile industry without an efficient and unbiased customs service. Decisions and actions by the Customs Service of Ethiopia are often arbitrary and confiscatory. Its behavior must be uniform across all businesses and clearly be guided by the rule of law. Unwarranted delays by customs service agents are common.

Regulatory restrictions on telecommunications. World governments, including the one in Ethiopia, must choose between a telecommunications monopoly or the development of export businesses. The successful pursuit of both is unfeasible. Cellular telephones and the Internet now give businesses an advantage in global customer service and supplier coordination. Access to these technologies is severely restricted in Ethiopia; indeed, access to most communication devices, such as fax machines, satellite dishes, etc., are controlled through centralized government regulations. This raises the costs and lowers the values of Ethiopian products relative to those of foreign competitors and places Ethiopia at a critical disadvantage in fast-paced western markets.

Advanced telecommunication and computer technologies have also helped businesses streamline their organizational structures and their supplier/customer relationships. For example, the development of Electronic Data Interchange (EDI) standards and practices has helped customers and suppliers share information that used to take days or weeks to exchange. This has drastically reduced the lead times between order and delivery, reducing risk and cost for all participants. Ethiopia cannot participate in this business revolution with its current telecommunications regulations.

Many developing countries, which do not have wire-based communications, are exploiting cellular technologies as a way to compete with industrialized countries. However, with cellular technology one supplier cannot control the access or distribution of communication devices. Because the Ethiopian government wants this control, it denies this technology to Ethiopian businesses.

Unreliable transportation. Ethiopian ground and rail transportation functions arbitrarily. Equipment is removed from scheduled service by government order and without notice. Fulfilling export orders for delivery at specific times is impossible under these conditions because business and law are not government priorities. To promote export business, the government will have to make the transportation system consistently available to all businesses.

Management turnover and inadequate expertise. In a survey of foreign buyers of Ethiopian textile products, the two most frequent complaints were lack of consistency of the enterprise management and the lack of technical capabilities of the general and commercial managers. In rapidly changing global textile markets, customers place great importance on supplier relationships. Foreign buyers are frustrated by the lack of good working relationships with senior management in Ethiopian enterprises, due to the high rate of turnover. Also, the

\60

senior managers' low level of technical expertise made the re-education of each successor difficult and risky.

To attract and hold good management will require numerous changes, including adequate monetary compensation and rewards performance in the market rather than in the bureaucracy, infrastructural and legal support to make planning and execution feasible, and authority over laborers. There is much consternation among government officials that top executives in the textile sector have left and are working in import businesses. Some executives stated unequivocally that they would not return under the industry's current structure.

Executives who are now working in textile import markets are gaining valuable experience in building working relationships with foreign businesses and realize this cannot be done in the public sector textile industry. Thus, they can successfully obtain textile products demanded by Ethiopians, but they could not arrange to produce the textiles demanded by export markets because there is inadequate cotton to supply the textile factories and inadequate access to the alternative raw materials, including man-made fibers, needed for export markets.

Passive marketing attitudes. The lack of priority and effort given to marketing has contributed to failure in domestic markets; passive marketing is even more detrimental in export markets. The development of an export market requires large commitments of financial and human resources without requiring the generation of immediate returns. The only meaningful connections the public sector textile industry has with export markets are through the agents of foreign buyers.

An active marketing program requires an understanding of foreign markets' needs and of how to translate these needs into saleable products and services. Even modest movement toward serving export markets is stifled by the Ethiopian bureaucracy. For example, management of the Adei Abeba Garment Factory was unable to provide the marketing specialist on the Chemonics team some samples to take to a major trade show in Europe because the factory would not be able to account for them. The result of this behavior is to forfeit valuable opportunities to find suppliers.

In summary, the Ethiopian public textile sector can export textile products only on a secondary, fill-in basis as instigated by foreign customers that have sales agents located in Ethiopia. Success at developing ongoing, substantial supplier relationships with export markets is precluded by the critical shortcomings discussed above. Overcoming these shortcomings would amount to repudiating the priorities inherent in a public sector bureaucracy. This explains why overcoming them usually involves privatization. Regardless, the changes necessary to export products successfully will hasten the demise of inefficient enterprises.

B3. Emphasize Domestic Fabric Markets

The greater threat to the Ethiopian textile enterprises is from imported products, primarily garments, rather than imported fabrics. Public sector garment factories have lost most of their market share to imports of new and second-hand clothing. The result is that domestic textile factories have lost a domestic outlet for their fabrics. This is due in part to the fact that many Ethiopian consumers prefer the construction, colors, and man-made fibers of imported clothing that are not available from domestic enterprises. Currently, the Ethiopian textile manufacturing sector is supplying traditional, low-value fabrics that are a declining segment of consumer demand.

The fabric produced for the domestic market can go to domestic garment manufacturers or consumers for home sewing. Taken together, these markets do not sell enough fabrics to use the capacity of the textile manufacturing enterprises. Therefore, the enterprises with the least useful capacities should be removed from production until a supply/demand balance is achieved. By reducing excess capacity, remaining textile manufacturing enterprises could focus on fewer constructions, thus improving their price competitiveness and profit margins through improved economies of scale. This approach would also reduce the demand for domestic cotton, more closely balancing it with domestic cotton production.

Focusing on domestic fabrics is only an interim strategy unless the domestic garment industry is able to grow. Even modest economic growth will reduce fabric demand based on home sewing. If the garment industry does not grow, the textile manufacturing sector is trapped, and gains in market shares by some enterprises will necessitate losses by others.

Even with this relatively passive option, there will be barriers to its effectiveness, including:

Customs service bureaucracy. To allow competitive momentum, textile manufacturing enterprises should be able to import, on a timely and cost-effective basis, man-made fibers and yarns demanded in the marketplace. Otherwise, the pace of down-sizing for the industry would be accelerated.

Unlimited bank overdrafts. After the surviving enterprises are rid of bad debts, unwarranted bank overdrafts must be stopped. If they were not, failing mills would continue to siphon off scarce credit, while decreasing market prices for fabrics and increasing prices for raw materials. This means that benefits to the good performing mills would be lost.

Lack of market information. Little basic information is available on the number of retail fabric stores, sewing machine sales, population changes, household incomes, textile imports, and other data needed for planning of a market segmentation strategy. Accurate and timely data would enable the managers of domestic enterprises to compete.

Inappropriate management structure. Currently, mills are not responsive to customer demands. The structural organization of the mills currently places buying and selling in the hands of a commercial manager while the operations manager is responsible for production and product development. As a result, the operations manager limits the products developed and offered for sale according to what can be done at the lowest cost. This impedes responsiveness to customer demands, which is needed to make this option actionable.

To summarize, almost all fabrics are currently channeled into a shrinking domestic market. To continue this will increase the pressure to down-size the textile manufacturing sector. Understanding and serving a broader range of domestic fabric demands will provide a foundation for moving into fabric export markets; much of the marketing advice given in this report is relevant to doing this. However, implementing this advice under the current structure of public sector textiles is probably not feasible.

B4. Foster Development of a Private Sector Garment Industry

The creation of a public sector garment industry failed previously for two important reasons:

- The intent was to serve suppliers rather than customers.
- The same structural constraints afflicting the rest of the textile industry applied.

The lack of a focus on developing and serving a customer base is exemplified by the failure of the Akaki Garment Factory to compete for government contracts and the collapse of the Nazareth Garment Factory after losing a customer that accounted for 40 percent of the enterprise's output. The rationale for establishing the Nazareth Garment Factory was to serve as a customer for the public sector textile mills. Objectives regarding customer markets or specific products were never articulated or even identified. Without these objectives, public enterprises will never develop the expertise that would enable cost savings and develop good market reputations.

With the garment factories being "captured" customers, the textile factories do not serve them as if they were free to choose their fabric suppliers. The Nazareth Garment Factory has promulgated a new brand name, Global, to lead consumers to think that the garments are imported rather than made of Ethiopian fabrics. This tactic will only help for a short time and will contribute to cynical consumer attitudes.

The symptoms of structural problems seen in textile manufacturing enterprises were also seen in garment manufacturing enterprises. For example:

- Thirteen people were seen standing around one cutting table. Only about one-third of all sewing machines were running, with two people assigned to most machines. Several more people were seen sitting idle at tables in the back of the factory.

- Management turnover is very high. At the Nazareth Garment Factory, several management changes have occurred in the past year; most recently the general manager was dismissed and replaced by the financial manager. Management at all public sector garment factories has no inclination to undertake the crisis management that their current situation demands.

There are some small and growing private sector apparel companies in Ethiopia; assistance to them has come largely through the micro-enterprise program of the European Union. They are quite small, however, and lack high quality fabrics. They have carved out niches in specialty designs and markets with higher value-added potential. They do not compete with salvage clothing nor will they try to do this; therefore, they do not offer an outlet for domestic textile factories in the near term. If allowed to compete by sourcing freely, manufacturing efficiently, and delivering on time, they could easily exceed the production of the public sector garment factories within a year or so. Historically, successful fabric and garment importers have eventually become major textile manufacturers because they capture more of the profits through manufacturing as they gain experience.

Critical barriers to developing a viable private sector garment industry include:

Trade restrictions. The Ethiopian apparel industry needs access to raw materials and to new ideas to grow. These come naturally from free importation. According to recent analyses by the Irish Trade Development Institute, the inability to access a broad range of fabrics and sundries (such as buttons, zippers, and thread) constrain the growth rate, product offerings, and competitiveness of private sector apparel manufacturers. This problem also denies enterprises a natural exposure to ideas for product innovations.

Another manifestation of restricting trade is government micro-management of buying and selling decisions by suppliers or customers. This includes governmental stipulation of the allocation of raw materials; the latest example is tying the sale of Universal Leather to access to the output of public tanneries.

Customs service bureaucracy. This approach requires that adversarial and confiscatory behavior by the Customs Service be stopped. The growth of small garment businesses cannot occur if operating capital is tied up, if the significant variety of supplies and accessories that must be imported are obstructed, or if the timely shipment of finished garments are delayed. They must have a customs service that makes the rules clear and requires only that the businesses obey those rules.

Lack of copyright laws. Development of a competitive garment manufacturing industry will require development of the ability to produce original designs and constructions. Such innovation requires investment and risk-taking, which cannot be adequately rewarded without copyright protection. Without it, domestic manufacturers will be constrained to copying designs of other domestic competitors or of import competitors.

To summarize, fostering development of a private sector garment industry is a long-term option that will not benefit the textile manufacturing sector for several years. In fact, it would require that the garment industry be allowed to function separately from the textile manufacturing industry. If not discouraged or prevented from global interaction, a garment sector would be the most natural way to enter export markets. Once this is accomplished, the garment sector would provide the impetus to develop the domestic textile manufacturing sector. A market-oriented garment sector would guide the textile sector in producing the fabrics needed by the market. In the meantime, however, most policies aimed at protecting and preserving the domestic textile manufacturing sector would have to be discontinued.

B5. Move Deliberately Toward a Closed, Centralized Textile Industry

Selection of this policy option would be a repudiation of the market-oriented changes that have been made during the past five years. This option must be included, if only to emphasize that the government cannot have it both ways; that is, it cannot have the benefits of open markets and free enterprise initiatives and, at the same time, continue to have centralized control of the resources and opportunities for economic activity. Throughout this project, the unwillingness to accept that there is not a way to make the cotton textile sector "efficient, productive and profitable," while maintaining a high degree of central control, has been the greatest source of frustration to PESA and the public sector bureaucracy.

The implicit requirement imposed on the Chemonics team was either to (1) prove that such a feat could not be accomplished with the public sector cotton textile industry, or (2) assume that it could be accomplished and then prescribe the procedural adjustments and infusions of resources needed to try. The case has been made that no other countries are doing with their textile sectors what Ethiopia wants to do; however, this has not been sufficient to convince the Ethiopian government otherwise.

Governments have historically fostered the perception that they are the primary creators of wealth, the providers of jobs, and the fountainheads of general welfare by closing their economies to outside influence and participation. This denies consumers a choice and insulates the producers from having to compete. Insulation from competition fosters inefficiency and corruption, and effectively makes the market serve the industry, rather than vice versa. It is possibly the only way to penalize 57,000,000 Ethiopian consumers to benefit the 30,000 public cotton textile sector employees, yet avoid (or at least postpone) the political unrest spawned by such an unbalanced allocation of economic benefits.

Experience has shown that people in developing countries are quick to seize on promises of employment and slow to comprehend losses to the general welfare. Nevertheless, the losses that result from closing an economy are astronomical. Observations over the years indicate that only extraordinary sources of central government revenue (such as oil revenues in several Arab countries) or extraordinary infusions of donor money (such as the Soviet Union's support of Cuba) can forestall the collapse of the system. Even in these cases, economic goods that are not rationed tend to come from outside the country. Therefore, the governments tend to exploit the few industries (i.e., job sources) that they can easily control and control the importation of products not produced domestically. The forces unleashed by globalization are making it increasingly difficult to perpetuate such a system.

In the context of the textile sector, closing the economy would require repressive measures to stop the movement of foreign-made garments and fabrics into Ethiopia. There can be no doubt that this would quickly expose the inability of the industry to supply the textiles demanded by Ethiopians. The combination of reduced quality, fewer choices, and increased costs to domestic textile consumers would result in much greater social unrest than would down-sizing the textile industry.

C. Putting the Options in Perspective

The first four policy objectives are advanced by the same structural changes aimed at liberalizing laws and regulations affecting trade, ownership, communication, and labor. Advancing these objectives requires that the protection and maintenance of the existing public sector industry cease to be a priority. Moving quickly toward these objectives requires that the government disengage from direct participation in specific enterprises and engage in providing infrastructures necessary for assisting all enterprises. This requires that the government be willing to relinquish direct control of major economic activity. Such control must be subject to impartial laws that do not vary with government administrations and leadership.

Global political realities are rapidly evolving in ways that preclude a primary reliance on donor funds to advance development objectives. Examination of textile and apparel industry development in three nations—the Republic of Korea, Mauritius, and the Dominican Republic—revealed that effective economic development began when the governments shifted their attention away from raising funds by satisfying donor agencies toward satisfying investors. These are not just role models; they are timely examples of the only course that is likely to be available to countries such as Ethiopia.

The end of the Cold War and the ineffectiveness of extra-market investment in commercial business enterprises have diminished the likelihood that donor agencies will be a source of funds for the Ethiopian cotton textile sector. The United States and the European Union are reevaluating their strategy for development aid. Development activities whose results fail to match their financial investment or those that do not foster free markets are increasingly becoming politically unacceptable.

To foster their survival, major development agencies are focusing on achieving self-sustaining successes with their aid programs. This requires the rapid ascendency of the private sector. A carefully watched model is USAID's Support for Eastern European Democracy (SEED) program. Under SEED, donor funds are funneled through a development bank as seed money to reduce the risk of private sector investment. The money is loaned or given to private entrepreneurs rather than provided as outright grants to foreign governments. The rationale is that direct involvement of investors will help to discipline business activities, thereby increasing the probability of success and justifying such aid programs.

This change in donor behavior undermines the hopes and expectations of the Ethiopian cotton textile sector. Donor funds for capital investment represent the only source targeted by existing enterprises, and they expect to prevail on foreign governments based on the desperateness of their situation. Instead, they must convince potential investors of their financial viability, technical and marketing ability, and general business acumen. This reality requires paying careful attention to policies that improve the investment climate such as appropriate currency regulations, labor laws, property rights, and information gathering and dissemination. The government must focus on enabling the private sector to compete for investment funds, rather than competing with the private sector by obtaining donated funds or diverting scarce national resources into these uncompetitive enterprises.

The structural changes emphasized in this report cannot be avoided if an open and competitive cotton textile sector is to result in Ethiopia. Proper structural foundations laid by the government will result in improved performance and increased prosperity over time. The following eight strategic recommendations would prepare the way for a viable, competitive Ethiopian cotton textile sector:

- Examine how existing enterprises stand with regard to legal criteria for viability outlined in Public Enterprise Proclamation No. 25/1992. For those that are not viable and cannot be made viable through debt forgiveness or other means, establish a plan for dissolution or down-sizing that includes meeting social obligations to workers.

- Examine, on a national scale, infrastructure requirements (including energy, transportation, communication, etc.) and set priorities for Ethiopia for the next decade. Examine the implications of these priorities for the textile sector and incorporate them into plans relating to cotton and textiles.

- Examine import and export tariffs and quotas to set them at levels that enable competitive activities by businesses and consistent enforcement by the customs service. As a component of the total import/export policy mix, include provisions for free trade zones.

- Develop and implement regulations on communications technology that allow businesses to participate freely, without being disadvantaged relative to other domestic and foreign competitors.

- Develop and implement private property rights, including allowances for land ownership and expanded foreign ownership. Hasten to enable owners of farms to prevent damage from livestock grazing or from other types of unlimited access to the farm land.

- Establish copyright protection laws sufficient to ensure that designs and product constructions cannot be copied by other businesses unless adequate royalties are paid to owners.

- Undertake campaigns to educate key institutions—such as courts, banks, customs service, etc.—about the current status and modus operandi of public sector enterprises.

- Establish the basic market data and information needed by businesses in Ethiopia, then develop an appropriate information gathering and disseminating system.

Persuasive movement by the government on these strategic recommendations would provide the foundation for more directed actions that would foster improved conduct and performance of the cotton textile sector. Ten tactical recommendations are emphasized in this regard:

- Concentrate on learning to respond to and exploit the domestic market before assuming an export emphasis.

- Make financial documentation more accurate and transparent so managers can make decisions to enhance profitability; restore integrity to the accounting and financial conventions that have been adopted as a matter of government policy. Hasten to alter the accounting for spare parts to reveal the true cost of spare parts inventories.

- Call in or write off accounts receivable and explore the feasibility of writing off some accounts payable. A sector-wide clearing-house empowered by the government could assist in these actions.

- In preparation for making each enterprise responsible for its survival, undertake a systematic examination of each enterprise's debt situation, determine how much of its debt will be forgiven and taken over by the government, and remove the liability from the financial statements.

- For each public enterprise determined to be viable, assist in the identification and funding of education and training programs in technical, marketing, and management areas. As early as possible, extend the availability of these programs to private sector personnel; the treatment of public versus private enterprises in cotton, textile, and apparel should disappear over the next few years.

- Make it clear to both management and labor that their success depends on their contribution toward the economic success of the enterprises, rather than on the exercise of bureaucratic power. Take steps to de-emphasize the management-by-committee approach and to emphasize individual initiative. Base promotions from within the enterprises on performance and demonstrated potential; prohibit bureaucratic interference with the promotion process and with the setting of salary levels.

- Strive to maximize cooperation with existing or potential private sector enterprises. To the extent that small private enterprises result from the down-sizing or dissolution of some public sector enterprises, they should be encouraged to do business with each other and with larger enterprises in the public and private sectors.

- For each public enterprise determined to be viable, implement recommendations for improving the technical conditions identified in this report. In every case, establish a cleaning and maintenance program that is routinely monitored by management.

- For each public enterprise determined to be viable, obtain assistance to help it undertake a Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis of the enterprise. This will take weeks to accomplish under expert guidance. It should yield a conclusion on which market segment(s) should be targeted and a mission statement on how each segment will be served.

- Following the execution of the SWOT analysis, each enterprise should establish a marketing strategy and make a plan of action for executing it that includes a detailed budget.

ANNEX A

FINANCIAL DATA AND EVALUATION FOR EIGHTEEN COMPANIES

ANNEX A
FINANCIAL DATA AND EVALUATION FOR EIGHTEEN COMPANIES

This annex includes a financial analysis for each of the 18 textile sector enterprises. The information includes balance sheets, profit and loss statements, and a financial analysis of the data with significant comments.

ABOBO AGRICULTURAL DEVELOPMENT ENTERPRISE
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Registered loss of Birr 945,000 in FY 1995
   - Has been losing money over the years resulting in accumulated losses of Birr 18.5 million

2. Net Worth

   - Negative Birr 8.2 million as of FY 1995

3. Net Working Capital/Liquidity

   - Negative Birr 2.6 million as of FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - None

2. Amount of Long-Term Loans

   - Birr 11.4 million

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - Not applicable

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 0.85

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 113 days of stock available

7. Net Margin (profit after taxes divided by net sales)

- None

8. Return on Assets (profit after taxes divided by total assets)

- None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Supporting Schedules

- Overhead costs in profit and loss statement do not agree with supporting schedules for all years.

2. Accounts Receivables

- Some of the trade debtors accounts have not moved since 1989 and 1992. The same is true for some of the associated enterprises accounts.

3. Associated Creditors

- None of the subsidiary account moved since FY 1991/92.

EXHIBIT A-1.

ABOBO AGRICULTURAL DEVELOPMENT ENTERPRISE
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	7,113,000	7,114,000	7,114,000
- Movable	5,426,000	5,426,000	5,426,000
	12,539,000	12,540,000	12,540,000
A/Depreciation : - Immovable	1,085,000	1,282,000	1,479,000
- Movable	4,792,000	5,060,000	5,193,000
	5,877,000	6,342,000	6,672,000
NET FIXED ASSETS	6,662,000	6,198,000	5,868,000
DEFERRED EXPENDITURE			
	6,662,000	6,198,000	5,868,000
CURRENT ASSETS:			
Cash	330,000	330,000	211,000
Trade Debtors	2,182,000	1,973,000	1,973,000
Associated & Other Debtors	11,912,000	6,611,000	6,489,000
TOTAL DEBTORS	14,094,000	8,584,000	8,462,000
STOCK - Finished Goods	1,089,000	946,000	1,100,000
General Stores	1,598,000	1,646,000	2,161,000
Inputs	2,564,000	2,564,000	2,287,000
Goods in Transit	334,000	724,000	724,000
WIP	250,000	450,000	623,000
TOTAL STOCK	5,835,000	6,330,000	6,895,000
TOTAL CURRENT ASSETS	20,259,000	15,244,000	15,568,000
TOTAL ASSETS	26,921,000	21,442,000	21,436,000
CURRENT LIABILITIES :			
Trade Creditors	1,395,000	1,395,000	754,000
Overdraft			
Other Creditors	78,000	906,000	906,000
Taxes & Cont.(p.tax,st.div.,cap.ch,res	705,000	909,000	909,000
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan			
Associated Enterp.	14,098,000	8,931,000	9,312,000
Interest Payable	3,072,000	3,366,000	4,052,000
Other Provisions/Differed liab.	1,546,000	1,803,000	2,318,000
TOTAL CURRENT LIABILITIES	20,894,000	17,310,000	18,251,000
NET WORKING CAPITAL	(635,000)	(2,066,000)	(2,683,000)
LONG TERM LIABILITIES			
AID BANK LOAN	11,432,000	11,432,000	11,432,000
OTHER LONG TERM LOANS			
	11,432,000	11,432,000	11,432,000
TOT.CUR.& LT LIAB.	32,326,000	28,742,000	29,683,000
NET-EQUITY			
STATE CAPITAL	10,297,000	10,297,000	10,297,000
State Grant			
GENERAL RESERVE/(accum.def).	(15,927,000)	(17,597,000)	(18,543,000)
Loan redemp.reserve			
TOTAL NET EQUITY	(5,630,000)	(7,300,000)	(8,246,000)
TOTAL LIAB.& CAPITAL	26,696,000	21,442,000	21,437,000

175

EXHIBIT A-2.

ABOBO AGRICULTURAL DEVELOPMENT ENTERPRISE
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	2,348,000	2,280,000	3,558,000
LESS: SALES TAX			
	2,348,000	2,280,000	3,558,000
COST OF GOODS SOLD			
Direct Material Cost	595,000	313,000	303,000
Direct Labour Cost	414,000	299,000	469,000
Direct Machinery Use cost	168,000	259,000	375,000
Farm OH Cost	2,332,000	2,006,000	2,267,000
Increase/Decrease in WIP			
Increase/Decrease in Finished G.			
	3,509,000	2,877,000	3,414,000
GROSS PROFIT(LOSS)	(1,161,000)	(597,000)	144,000
OTHER INCOME	110,000	79,000	112,000
	(1,051,000)	(518,000)	256,000
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION			
ADMINISTRATION			
CORPORATION LEVY			
INTEREST		637,000	686,000
CAPITAL CHARGE			
AUDIT FEE	549,000	515,000	515,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS			
	549,000	1,152,000	1,201,000
OPERATING NET PROF.(LOSS)	(1,600,000)	(1,670,000)	(945,000)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	(1,600,000)	(1,670,000)	(945,000)

ADDIS GARMENT FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially intermediate
- Sales need to increase significantly if the factory is to become viable.

B. MAJOR FINANCIAL INDICATORS

1. Profitability

    - Profit of Birr 64,432 in FY 1995
    - Losses totaling Birr 2.1 million during FY 1993 and FY 1994

2. Net Worth

    - Birr 2.6 million in FY 1995.
    - This positive figure was due to the USA Cotton fund (Birr 2.8 million) allocated to the factory.

3. Net Working Capital/Liquidity

    - Birr 2.7 million in FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

    - None

2. Amount of long-term loans

    - Birr 465,480 as of FY 1995

3. Debt-Equity Ratio (total liabilities divided by net worth)

    - 297 percent

4. Re-valuation of Assets

    - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

    - 1.37

112

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 125 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - 1.1 percent in FY 1995

8. Return on Assets (profit after taxes divided by total assets)

   - 0.6 percent in FY 1995

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Inventory and Spare Parts Valuation

   - Supporting documents are not available to analyze what appear to be high levels of general stores (Birr 5.0 million) and finished goods (Birr 2.0 million).

2. Accounting Errors

   - There are a number of accounting errors in the financial data which was developed by the factory. For example, the supporting schedules for direct material costs for FY 1993 do not agree with the profit and loss statement.

EXHIBIT A-3.

ADDIS GARMENT FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	658,591	639,273	639,273
- Movable	1,829,792	2,144,110	2,151,025
	2,488,383	2,783,383	2,790,298
A/Depreciation : - Immovable	524,849	528,818	134,340
- Movable	1,643,528	1,804,147	2,284,950
	2,168,377	2,332,965	2,419,290
NET FIXED ASSETS	320,006	450,418	371,008
DEFERRED EXPENDITURE			
	320,006	450,418	371,008
CURRENT ASSETS:			
Cash	1,000	489	23,310
Trade Debtors	2,454,495	2,905,263	629,801
Associated & Other Debtors	-	-	2,160,331
TOTAL DEBTORS	2,454,495	2,905,263	2,790,132
STOCK - Finished Goods	2,936,813	2171190	2,018,500
General Stores	2,828,235	4,470,893	4,999,893
Inputs			
Goods in Transit	364,600	43,832	80,242
WIP	1,466,272	358,969	180,616
TOTAL STOCK	7,595,920	7,044,884	7,279,251
TOTAL CURRENT ASSETS	10,051,415	9,950,636	10,092,693
TOTAL ASSETS	10,371,421	10,401,054	10,463,701
CURRENT LIABILITIES :			
Trade Creditors	5,346,209	5,988,770	1,579,912
Overdraft			
Other Creditors	1,252,617	1,392,981	1,403,254
Taxes & Cont.(p.tax,st.div.,cap.ch,res			
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan	1,678,588	2,382,343	2,464,581
Associated Enterp.			964,493
Interest Payable			
Other Provisions/Differed liab.	730,912	936,186	947,897
TOTAL CURRENT LIABILITIES	9,008,326	10,700,280	7,360,137
NET WORKING CAPITAL	1,043,089	(749,644)	2,732,556
LONG TERM LIABILITIES			
AID BANK LOAN			
OTHER LONG TERM LOAN	465,480	465,480	465,480
	465,480	465,480	465,480
TOT.CUR.& LT LIAB.	9,473,806	11,165,760	7,825,617
NET-EQUITY			
STATE CAPITAL	1,001,012	1,001,012	2,638,084
State Grant			
GENERAL RESERVE/(accum.def).	(103,397)	(1,765,718)	-
Loan redemp.reserve			
TOTAL NET EQUITY	897,615	(764,706)	2,638,084
TOTAL LIAB.& CAPITAL	10,371,421	10,401,054	10,463,701

EXHIBIT A-4.

ADDIS GARMENT FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	3,233,940	5,952,973	5,909,256
LESS: SALES TAX			
	3,233,940	5,952,973	5,909,256
COST OF GOODS SOLD			
Direct Material Cost	2,688,257	3,195,496	3,145,589
Direct Labour Cost	709,660	765,273	694,438
Direct Machinery Use cost			
Manufacturing OH Cost	636,201	722,789	731,795
Increase/Decrease in WIP	50,419	1,107,300	178,353
Increase/Decrease in Finished G.	(1,390,718)	765,623	152,690
	2,693,819	6,556,481	4,902,865
GROSS PROFIT(LOSS)	540,121	(603,508)	1,006,391
OTHER INCOME	100,692	262,875	415,219
	640,813	(340,633)	1,421,610
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	262,799	522,919	451,281
ADMINISTRATION	321,686	560,658	490,207
CORPORATION LEVY			
INTEREST	120,626	332,875	350,236
CAPITAL CHARGE			
AUDIT FEE	15,510		
PROVISION FOR STOCK OBSOL.	18,700	7,013	
PROVISION FOR DOUBTFUL A/C	193,004		
BOARD MEMBER FEES			18,820
OTHERS			
	932,325	1,423,465	1,310,544
OPERATING NET PROF.(LOSS)	(291,512)	(1,764,098)	111,066
Prior Year Adjustment			
Profit Tax	0		46,634
NET PROFIT(LOSS) After TAX	(291,512)	(1,764,098)	64,432

ADEI ABEBA YARN FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Lost Birr 4.4 million in FY 1995
   - Never registered profit in last 10 years

2. Net Worth

   - Positive net worth of Birr 12.9 million in FY 1995 according to the financial statement
   - However, the assets were revalued upwards in FY 1993 by Birr 28 million. The revaluation was done on instructions by the Ministry of Finance and resulted in almost wiping out the accumulated depreciation to date. This action is a highly questionable. Had it not been done, the enterprise would have a net worth of negative Birr 15.1 million.

3. Net Working Capital/Liquidity

   - Birr 11.9 million for FY 1995
   - However, both general stores and debtors have large amounts outstanding which may undermine the factory's liquidity. Neither areas have supporting schedules.

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - Birr 1.8 million as of March 1996

2. Amount of Long-Term Loans

   - Birr 24.8 million in FY 1995

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 530 percent

4. Re-valuation of Assets

   - Assets were revalued in FY 1993, raising the net book value by Birr 28 million. This is an unacceptable accounting practice.

5. Liquidity/Current Ratio (current assets divided by current liabilities)

    - 1.27

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

    - 64 days of stock available

7. Net Margin (profit after taxes divided by net sales)

    - None

8. Return on Assets (profit after taxes divided by total assets)

    - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Inventory and Spare Parts Valuation

    - No supporting documents are available on general stores which equal a large amount, Birr 19.9 million.

2. Accounts Receivables

    - Supporting documents are not available to look at aging of accounts.

3. Finished Goods and Work in Process

- The figure for the work in process in FY 1994 on the supporting schedules (Birr 1,278,000) does not agree with the figure on the balance sheet (Birr 1,424,000). Also, some of the signs are confused for entries for both finished goods and work in process.

EXHIBIT A-5.

ADEI ABEBA YARN FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	33,659,000	33,875,000	33,875,000
- Movable	1,699,000	1,598,000	1,598,000
	35,358,000	35,473,000	35,473,000
A/Depreciation : - Immovable	2,040,000	6,024,000	8,972,000
- Movable	187,000	471,000	722,000
	2,227,000	6,495,000	9,694,000
NET FIXED ASSETS	33,131,000	28,978,000	25,779,000
DEFERRED EXPENDITURE			
	33,131,000	28,978,000	25,779,000
CURRENT ASSETS:			
Cash	2,000	2,000	4,742,000
Trade Debtors	889,000	2,541,000	2,563,000
Associated & Other Debtors	6,532,000	5,438,000	6,257,000
TOTAL DEBTORS	7,421,000	7,979,000	8,820,000
STOCK - Finished Goods	6,786,000	9,195,000	6,521,000
General Stores	13,927,000	17,928,000	19,932,000
Inputs			
Goods in Transit	3,616,000	14,811,000	13,406,000
WIP	1,493,000	1,424,000	2,253,000
TOTAL STOCK	25,822,000	43,358,000	42,112,000
TOTAL CURRENT ASSETS	33,245,000	51,339,000	55,674,000
TOTAL ASSETS	66,376,000	80,317,000	81,453,000
CURRENT LIABILITIES :			
Trade Creditors	2,285,000	1,348,000	1,595,000
Overdraft	352,000	2,484,000	
Other Creditors	15,152,000	2,151,000	3,254,000
Taxes & Cont.(p.tax,st.div.,cap.ch,res	9,119,000	13,188,000	19,489,000
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan			
Associated Enterp.	12,700,000	12,770,000	12,271,000
Interest Payable	4,119,000	6,256,000	7,151,000
Other Provisions/Differed liab.			
TOTAL CURRENT LIABILITIES	43,727,000	38,197,000	43,760,000
NET WORKING CAPITAL	(10,482,000)	13,142,000	11,914,000
LONG TERM LIABILITIES			
AID BANK LOAN	25,246,000	24,773,000	24,773,000
OTHER LONG TERM LOANS			
	25,246,000	24,773,000	24,773,000
TOT.CUR.& LT LIAB.	68,973,000	62,970,000	68,533,000
NET-EQUITY			
STATE CAPITAL	19,175,000	23,245,000	23,246,000
State Grant			
GENERAL RESERVE/(accum.def).	(21,772,000)	(5,898,000)	(10,326,000)
Loan redemp.reserve			
TOTAL NET EQUITY	(2,597,000)	17,347,000	12,920,000
TOTAL LIAB.& CAPITAL	66,376,000	80,317,000	81,453,000

EXHIBIT A-6.

ADEI ABEBA YARN FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	18,404,000	30,477,000	37,092,000
LESS: SALES TAX			
	18,404,000	30,477,000	37,092,000
COST OF GOODS SOLD			
Direct Material Cost	17,253,000	20,254,000	20,166,000
Direct Labour Cost	5,813,000	7,527,000	7,198,000
Direct Machinery Use cost	1,924,000	2,893,000	2,893,000
Manufacturing OH Cost	3,715,000	3,844,000	4,188,000
Increase/Decrease in WIP	462,000	(80,000)	(829,000)
Increase/Decrease in Finished G.	(3,242,000)	(4,222,000)	2,675,000
	25,925,000	30,216,000	36,291,000
GROSS PROFIT(LOSS)	(7,521,000)	261,000	801,000
OTHER INCOME	2,363,000	990,000	658,000
	(5,158,000)	1,251,000	1,459,000
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	1,000	27,000	49,000
ADMINISTRATION	1,771,000	4,048,000	3,634,000
CORPORATION LEVY			
INTEREST	1,286,000	2,375,000	2,148,000
CAPITAL CHARGE	187,000		
AUDIT FEE	13,000	28,000	28,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS			
	3,258,000	6,478,000	5,859,000
OPERATING NET PROF.(LOSS)	(8,416,000)	(5,227,000)	(4,400,000)
Prior Year Adjustment	223,000	(42,000)	(27,000)
Profit Tax			
NET PROFIT(LOSS) After TAX	(8,193,000)	(5,269,000)	(4,427,000)

AKAKI GARMENT FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially intermediate
- Sales volume needs to increase or the enterprise will not be viable.

B. MAJOR FINANCIAL INDICATORS

1. Profitability
   - Loss of Birr 2.2 million in FY 1995
   - Profit of Birr 1.2 million in FY 1993 and Birr 0.2 million in FY 1994
2. Net Worth
   - Birr 9.6 million in FY 1995
   - The enterprise was provided with American Cotton credit of Birr 8.9 million in 1994.
   - Before this, the net worth of the enterprise was Birr 1.2 million.
3. Net Working Capital/Liquidity
   - Birr 8.2 million in FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia
   - Birr 3.2 million as of March 1996
2. Amount of Long-Term Loans
   - None
3. Debt-Equity Ratio (total liabilities divided by net worth)
   - 179 percent
4. Re-valuation of Assets
   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

    - 1.48

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

    - Insufficient information

7. Net Margin (profit after taxes divided by net sales)

    - None

8. Return on Assets (profit after taxes divided by total assets)

    - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Sales Volume

    - During the last three years sales have dropped from Birr 25.6 million in FY 1993, to Birr 18.5 million in FY 1994, to Birr 9.9 million in FY 1995.

    - If sales volume does improve dramatically, this enterprise will not survive.

EXHIBIT A-7.

AKAKI GARMENT FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	3,886,161	4,054,128	4,058,575
- Movable	145,059	465,675	465,675
	4,031,220	4,519,803	4,524,250
A/Depreciation : - Immovable	2,600,359	2,752,948	2,857,457
- Movable	144,979	194,097	304,137
	2,745,338	2,947,045	3,161,594
NET FIXED ASSETS	1,285,882	1,572,758	1,362,656
DEFERRED EXPENDITURE			
	1,285,882	1,572,758	1,362,656
CURRENT ASSETS:			
Cash	4,277,245	4,395,515	842,549
Trade Debtors	8,021,038	11,350,700	10,961,476
Associated & Other Debtors	-	-	-
TOTAL DEBTORS	8,021,038	11,350,700	10,961,476
STOCK - Finished Goods			
General Stores			
Inputs			
Goods in Transit			
WIP			
TOTAL STOCK	13,114,029	14,210,609	13,593,272
TOTAL CURRENT ASSETS	25,412,312	29,956,824	25,397,297
TOTAL ASSETS	26,698,194	31,529,582	26,759,953
CURRENT LIABILITIES :			
Trade Creditors	15,761,720	19,036,217	6,443,849
Overdraft			
Other Creditors			
Taxes & Cont.(p.tax,st.div.,cap.ch,res	4,388,214	5,116,662	4,618,327
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan			
Associated Enterp.			
Interest Payable			
Other Provisions/Differed liab.	5,267,481	6,094,361	6,095,469
TOTAL CURRENT LIABILITIES	25,417,415	30,247,240	17,157,645
NET WORKING CAPITAL	(5,103)	(290,416)	8,239,652
LONG TERM LIABILITIES			
AID BANK LOAN			
OTHER LONG TERM LOAN			
	-	-	-
TOT.CUR.& LT LIAB.	25,417,415	30,247,240	17,157,645
NET-EQUITY			
STATE CAPITAL	600,000	60,000	11,338,000
State Grant			
GENERAL RESERVE/(accum.def).	680,779	1,222,342	(1,735,692)
Loan redemp.reserve			
TOTAL NET EQUITY	1,280,779	1,282,342	9,602,308
TOTAL LIAB.& CAPITAL	26,698,194	31,529,582	26,759,953

EXHIBIT A-8.

AKAKI GARMENT FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	25,615,223	18,501,733	9,865,482
LESS: SALES TAX			
	25,615,223	18,501,733	9,865,482
COST OF GOODS SOLD			
Direct Material Cost	17,314,052	13,965,046	7,098,251
Direct Labour Cost	2,338,551	2,644,604	2,964,398
Direct Machinery Use cost	126,364	191,621	203,805
Manufacturing OH Cost	1,919,467	1,567,463	1,232,193
Increase/Decrease in WIP	623,465	(350,296)	278,496
Increase/Decrease in Finished G.	972,509	(842,392)	(655,401)
	23,294,408	17,176,046	11,121,742
GROSS PROFIT(LOSS)	2,320,815	1,325,687	(1,256,260)
OTHER INCOME	57,816	66,273	120,667
	2,378,631	1,391,960	(1,135,593)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	131,019	208,798	221,715
ADMINISTRATION	926,905	875,227	861,029
CORPORATION LEVY	39,936		
INTEREST	13,022	26,256	1,548
CAPITAL CHARGE	14,100		
AUDIT FEE	30,594	25,000	18,206
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS			
	1,155,576	1,135,281	1,102,498
OPERATING NET PROF.(LOSS)	1,223,055	256,679	(2,238,091)
Prior Year Adjustment			
Profit Tax	611,527	128,339	
NET PROFIT(LOSS) After TAX	611,528	128,340	(2,238,091)

AKAKI TEXTILE FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially intermediate

B. MAJOR FINANCIAL INDICATORS

1. Profitability

- Loss of Birr 8.5 million in FY 1995
- Incurred losses in two of the last three years.

2. Net Worth

- Positive net worth of Birr 26.4 million in FY 1995
- But a revaluation of some of the current assets, particularly debtors and stock accounts, may significantly reduce the net worth.

3. Net Working Capital/Liquidity

- Positive figure of Birr 21.7 million for FY 1995
- Again, a large amount of current assets may not be available for cash flow purposes.

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

- Birr 14.4 million as of March 1996

2. Amount of Long-Term Loans

- None

3. Debt-Equity Ratio (total liabilities divided by net worth)

- 289 percent

4. Re-valuation of Assets

- Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

- 1.28

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 101 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Inventory and Spare Parts Valuation

   - The level of finished goods inventory is too high. A closer look may show a portion to be obsolete.

2. Accounts Receivables

   - The supporting schedules were not available for the Birr 30.5 million in outstanding A/C. It may be possible that some of this amount is long-term and uncollectible.

3. Taxes and Contributions

   - Supporting schedules were not available on the amounts and type of taxes and contributions. It is unlikely that this enterprise would be able to clear the outstanding debt in this area of Birr 27.3 million.

EXHIBIT A-9.

AKAKI TEXTILE FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	44,068,528	44,128,758	44,221,527
- Movable	2,267,914	2,325,161	2,073,319
	46,336,442	46,453,919	46,294,846
A/Depreciation : - Immovable	39,100,994	39,460,924	39,758,461
- Movable	2,068,953	2,108,246	1,837,975
	41,169,947	41,569,170	41,596,436
NET FIXED ASSETS	5,166,495	4,884,749	4,698,410
DEFERRED EXPENDITURE			
	5,166,495	4,884,749	4,698,410
CURRENT ASSETS:			
Cash		10,410	10,410
Trade Debtors	3,202,695	1,499,066	9,859,801
Associated & Other Debtors	17,815,737	21,684,717	20,673,163
TOTAL DEBTORS	21,018,432	23,183,783	30,532,964
STOCK - Finished Goods	5,775,107	24,458,746	20,271,366
General Stores	5,945,890	10,279,676	13,877,297
Inputs	17,071,717	26,820,640	16,864,865
Goods in Transit	7,452,733	8,634,597	7,884,741
WIP	4,884,971	5,644,891	8,510,772
TOTAL STOCK	41,130,418	75,838,550	67,409,041
TOTAL CURRENT ASSETS	62,148,850	99,032,743	97,952,415
TOTAL ASSETS	67,315,345	103,917,492	102,650,825
CURRENT LIABILITIES :			
Trade Creditors	8,389,931	24,202,684	22,994,346
Overdraft			
Other Creditors	1,522,595	1,959,516	4,446,643
Taxes & Cont.(p.tax,st.div.,cap.ch,res	18,408,418	20,527,699	27,296,678
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan	4,418,317	14,862,121	15,508,389
Associated Enterp.	3,954,529	5,340,232	4,427,911
Interest Payable			
Other Provisions/Differed liab.	18,765,340	2,349,348	1,607,433
TOTAL CURRENT LIABILITIES	55,459,130	69,241,600	76,281,400
NET WORKING CAPITAL	6,689,720	29,791,143	21,671,015
LONG TERM LIABILITIES			
AID BANK LOAN			
OTHER LONG TERM LOANS			
	-	-	-
TOT.CUR.& LT LIAB.	55,459,130	69,241,600	76,281,400
NET-EQUITY			
STATE CAPITAL	21,791,636	40,709,365	40,721,050
State Grant			
GENERAL RESERVE/(accum.def).	(9,935,421)	(6,033,473)	(14,351,625)
Loan redemp.reserve			
TOTAL NET EQUITY	11,856,215	34,675,892	26,369,425
TOTAL LIAB.& CAPITAL	67,315,345	103,917,492	102,650,825

EXHIBIT A-10.

AKAKI TEXTILE FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	52,950,090	73,739,410	81,872,123
LESS: SALES TAX	7,951,733	7,972,086	8,765,026
	44,998,357	65,767,324	73,107,097
COST OF GOODS SOLD			
Direct Material Cost	22,091,734	40,481,441	37,206,719
Direct Labour Cost	13,286,431	13,971,060	12,774,006
Direct Machinery Use cost	13,603,961	16,025,779	14,146,243
Manufacturing OH Cost	1,894,403	6,046,371	6,538,072
Increase/Decrease in WIP	(2,780,104)	(759,920)	(2,865,880)
Increase/Decrease in Finished G.	(2,531,399)	(18,683,639)	4,187,380
	45,565,026	57,081,092	71,986,540
GROSS PROFIT(LOSS)	(566,669)	8,686,232	1,120,557
OTHER INCOME	1,996,910	2,620,590	411,877
	1,430,241	11,306,822	1,532,434
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION			
ADMINISTRATION	6,550,849	7,856,452	7,769,250
CORPORATION LEVY	88,765		
INTEREST	668,204	1,853,420	1,866,871
CAPITAL CHARGE	92,030		
AUDIT FEE	36,175	35,000	35,000
PROVISION FOR STOCK OBSOL.		318,769	340,649
PROVISION FOR DOUBTFUL A/C	23,096		
BOARD MEMBER FEES			
OTHERS			
	7,459,119	10,063,641	10,011,770
OPERATING NET PROF.(LOSS)	(6,028,878)	1,243,181	(8,479,336)
Prior Year Adjustment			
Profit Tax		780,975	
NET PROFIT(LOSS) After TAX	(6,028,878)	462,206	(8,479,336)

ARBA MINCH TEXTILE FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Loss of Birr 9.9 million in FY 1995
   - Accumulated loss over the last three years of its existence is Birr 26.2 million, losing money each of the last three years.

2. Net Worth

   - Positive Birr 16.3 million in FY 1995
   - At the current rate of loss, the net worth of the enterprise will be zero or negative in FY 1996.

3. Net Working Capital/Liquidity

   - Birr 2.8 million in FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - Birr 7.7 million in FY 1995
   - Birr 3.2 million as of March 1996

2. Amount of Long-Term Loans

   - Birr 115.0 million in FY 1995

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 1060 percent

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 1.05

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 424 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Inventory

   - Finished goods has increased to Birr 23.4 million indicating possible marketing problems and a likely overvaluation of inventory.

2. Accounts Receivables

   - Total of Birr 23.8 million in FY 1995. No supporting schedules.

3. Accounting Errors and Supporting Schedules

   - Some of the supporting schedules are missing.

   - There are a number of mathematical errors. Several entries in the balance sheet do not correspond to those in the profit and loss statement, such as work in process and finished goods.

EXHIBIT A-11.

ARBA MINCH TEXTILE FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	154,470,253	155,162,729	155,162,729
- Movable	2,231,579	2,231,579	2,144,959
	156,701,832	157,394,308	157,307,688
A/Depreciation : - Immovable	9,905,006	19,556,373	29,207,741
- Movable	1,296,600	1,742,916	2,171,907
	11,201,606	21,299,289	31,379,648
NET FIXED ASSETS	145,500,226	136,095,019	125,928,040
DEFERRED EXPENDITURE	5,544,174	4,158,131	2,772,087
	151,044,400	140,253,150	128,700,127
CURRENT ASSETS:			
Cash	610,910	819,664	752,814
Trade Debtors	11,281,711	9,810,498	10,940,379
Associated & Other Debtors	4,246,295	11,050,108	12,906,904
TOTAL DEBTORS	15,528,006	20,860,606	23,847,283
STOCK - Finished Goods	8,879,855	18,017,247	23,199,148
General Stores	3,490,442	136,254	437,132
Inputs	7,005,833	10,116,732	6,186,199
Goods in Transit	1,857,375	5,368,746	2,614,221
WIP	7,644,097	2,641,044	4,109,466
TOTAL STOCK	28,877,602	36,280,023	36,546,166
TOTAL CURRENT ASSETS	45,016,518	57,960,293	61,146,263
TOTAL ASSETS	196,060,918	198,213,443	189,846,390
CURRENT LIABILITIES :			
Trade Creditors	3,251,885	2,576,550	2,960,323
Overdraft	9,070,493	11,178,272	7,655,734
Other Creditors	17,418,796	26,003,699	33,159,578
Taxes & Cont.(p.tax,st.div.,cap.ch,res			
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others	11,035,153	14,974,301	14,038,000
AID BANK - Short T.Loan			
Other - Short T.Loan	2,700,000	2,470,000	
Associated Enterp.			
Interest Payable			
Other Provisions/Differed liab.	1,833,253	709,295	710,146
TOTAL CURRENT LIABILITIES	45,309,580	57,912,117	58,523,781
NET WORKING CAPITAL	(293,062)	48,176	2,622,482
LONG TERM LIABILITIES			
AID BANK LOAN	28,000,000	24,500,000	21,000,000
OTHER LONG TERM LOANS	89,995,556	89,556,408	93,992,710
	117,995,556	114,056,408	114,992,710
TOT.CUR.& LT LIAB.	163,305,136	171,968,525	173,516,491
NET-EQUITY			
STATE CAPITAL	40,288,185	42,569,844	42,569,844
State Grant			
GENERAL RESERVE/(accum.def).	(7,532,403)	(16,324,929)	(26,239,944)
Loan redemp.reserve			
TOTAL NET EQUITY	32,755,782	26,244,915	16,329,900
TOTAL LIAB.& CAPITAL	196,060,918	198,213,440	189,846,391

EXHIBIT A-12.

ARBA MINCH TEXTILE FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	15,513,425	17,612,786	22,219,463
LESS: SALES TAX	90,827	868,139	2,082,908
	15,422,598	16,744,647	20,136,555
COST OF GOODS SOLD			
Direct Material Cost	11,275,459	7,053,925	9,699,243
Direct Labour Cost	514,200	636,248	826,213
Direct Machinery Use cost			
Manufacturing OH Cost	13,530,021	13,685,731	14,467,915
Increase/Decrease in WIP	(4,147,208)	1,506,164	(1,468,422)
Increase/Decrease in Finished G.	(8,497,966)	(9,519,281)	(5,181,901)
	12,674,506	13,362,787	18,343,048
GROSS PROFIT(LOSS)	2,748,092	3,381,860	1,793,507
OTHER INCOME	511,276	324,982	248,246
	3,259,368	3,706,842	2,041,753
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	81,416	1,400,540	417,281
ADMINISTRATION	2,121,537	2,021,572	2,684,756
CORPORATION LEVY			
INTEREST	5,776,992	7,127,000	6,923,413
CAPITAL CHARGE			
AUDIT FEE			
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS	2,811,826	1,931,473	1,924,999
	10,791,771	12,499,365	11,956,769
OPERATING NET PROF.(LOSS)	(7,532,403)	(8,792,523)	(9,915,016)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	(7,532,403)	(8,792,523)	(9,915,016)

AWASA TEXTILE FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound: Not-profitable and a total of Birr 153.0 million due in interests, taxes, and loans.

B. MAJOR FINANCIAL INDICATORS

1. Profitability

- Lost Birr 16.7 million in FY 1995
- Has not made a profit during the last six years

2. Net Worth

- Positive net worth of Birr 31.8 million in FY 1995.
- If losses continue at current rate, net worth will be zero in two years.

3. Net Working Capital/Liquidity

- Birr 29.8 million for FY 1995.
- The actual net working capital is probably lower because Akaki Textile Factory alone owes this enterprise Birr 11.4 million.
- The validity of the liquidity amount is also challenged because this large an enterprise is operating with cash levels below Birr 1,000.

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

- Birr 3.9 million as of March 1996

2. Amount of Long-Term Loans

- Loans of approximately Birr 108.4 million plus interest due of Birr 25.1 million

3. Debt-Equity Ratio (total liabilities divided by net worth)

- 557 percent

4. Re-valuation of Assets

- Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 1.34

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 180 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Spare Parts Valuation

   - The following details the amount of spare parts:

FY 1992	Birr	4.0 million
FY 1993	Birr	6.2 million
FY 1994	Birr	9.9 million
FY 1995	Birr	14.6 million

   - During the last fiscal year, an additional Birr 4.7 million was spent on spare parts.

2. Accounts Receivables

   - See note above under net working capital.

3. Interest Payable versus Interest Expense

   - Interest payable is five time interest expense signifying a large and growing arrears in interest payable.

   - Interest payable FY 1995 Birr 25.1 million
     Interest expense FY 1995 Birr 5.3 million

EXHIBIT A-13.

AWASA TEXTILE FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	133,469,354	133,839,124	133,940,445
- Movable	5,097,179	5,103,912	5,253,123
	138,566,533	138,943,036	139,193,568
A/Depreciation : - Immovable	29,012,628	37,187,459	45,342,130
- Movable	3,431,371	3,861,752	4,269,385
	32,443,999	41,049,211	49,611,515
NET FIXED ASSETS	106,122,534	97,893,825	89,582,053
DEFERRED EXPENDITURE	3,357,535	2,791,739	2,256,043
	109,480,069	100,685,564	91,838,096
CURRENT ASSETS:			
Cash	1,708,261	767	517
Trade Debtors	4,231,805	174,474	1,392,881
Associated & Other Debtors	24,564,522	31,031,286	24,761,325
TOTAL DEBTORS	28,796,327	31,205,760	26,154,206
STOCK - Finished Goods	10,423,351	19,889,626	18,485,550
General Stores	7,994,138	11,792,967	16,701,022
Inputs	22,733,627	30,930,626	26,172,860
Goods in Transit	8,581,681	8,288,064	15,114,630
WIP	11,355,578	15,274,053	14,419,484
TOTAL STOCK	61,088,375	86,175,336	90,893,546
TOTAL CURRENT ASSETS	91,592,963	117,381,863	117,048,269
TOTAL ASSETS	201,073,032	218,067,427	208,886,365
CURRENT LIABILITIES :			
Trade Creditors			
Overdraft	4,137,518	3,850,802	1,307,853
Other Creditors	8,911,665	3,940,297	1,062,998
Taxes & Cont.(p.tax,st.div.,cap.ch,res	3,585,473	11,370,828	19,419,435
Curr.Mat.LTD.- AID Bank	11,298,625	14,955,375	18,612,125
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan	7,664,706	7,664,706	7,664,706
Associated Enterp.	9,326,922	10,864,315	7,942,857
Interest Payable	15,195,109	20,143,232	25,091,355
Other Provisions/Differed liab.	7,188,220	4,605,889	6,144,870
TOTAL CURRENT LIABILITIES	67,308,238	77,395,444	87,246,199
NET WORKING CAPITAL	24,284,725	39,986,419	29,802,070
LONG TERM LIABILITIES			
AID BANK LOAN	23,284,075	19,627,325	15,970,575
OTHER LONG TERM LOAN	73,896,455	73,896,455	73,896,455
	97,180,530	93,523,780	89,867,030
TOT.CUR.& LT LIAB.	164,488,768	170,919,224	177,113,229
NET-EQUITY			
STATE CAPITAL	34,016,550	48,859,550	50,590,550
State Grant			
GENERAL RESERVE/(accum.def).	2,567,714	(1,711,346)	(18,817,414)
Loan redemp.reserve			
TOTAL NET EQUITY	36,584,264	47,148,204	31,773,136
TOTAL LIAB.& CAPITAL	201,073,032	218,067,428	208,886,365

EXHIBIT A-14.

AWASA TEXTILE FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	29,984,611	35,624,411	37,514,687
LESS: SALES TAX			
	29,984,611	35,624,411	37,514,687
COST OF GOODS SOLD			
Direct Material Cost	19,586,627	22,619,987	18,605,862
Direct Labour Cost	583,966	779,835	843,963
Direct Machinery Use cost			
Manufacturing OH Cost	17,901,769	22,525,870	24,728,959
Increase/Decrease in WIP	(8,002,490)	(3,918,475)	854,569
Increase/Decrease in Finished G.	(6,893,876)	(9,466,276)	1,404,077
	23,175,996	32,540,941	46,437,430
GROSS PROFIT(LOSS)	6,808,615	3,083,470	(8,922,743)
OTHER INCOME	2,027,547	1,801,806	1,965,785
	8,836,162	4,885,276	(6,956,958)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	360,794	626,612	890,466
ADMINISTRATION	2,887,743	3,083,837	3,517,704
CORPORATION LEVY	116,525		
INTEREST	5,236,426	5,233,140	5,350,042
CAPITAL CHARGE	20,000	50,000	
AUDIT FEE			
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C	257,492		
BOARD MEMBER FEES			
OTHERS			
	8,878,980	8,993,589	9,758,212
OPERATING NET PROF.(LOSS)	(42,818)	(4,108,313)	(16,715,170)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	(42,818)	(4,108,313)	(16,715,170)

BAHIR DAR TEXTILE FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Lost Birr 4.9 million in FY 1995

   - The enterprise has lost money over the last six years.

2. Net Worth

   - Positive value of Birr 26.5 million in FY 1995

   - However, two changes occurred which have significantly altered the figure of net worth:

     - Between FY 1992 and 1993, assets were re-valued (see following section).

     - Between FY 1993 and 1994, cotton was donated from the United States increasing the net worth figure by an additional Birr 21,565,000.

   - If these two actions had not occurred, then the present net worth of the enterprise would be approximately negative Birr 24.1 million.

3. Net Working Capital/Liquidity

   - Negative Birr 8.3 million as of FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - None

2. Amount of Long-Term Loans

   - Birr 16.4 million

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 329 percent

4. Re-valuation of Assets

   - Between FY 1992 and 1993, assets were re-valued by decreasing the amount of accumulated depreciation in excess of Birr 29.1 million.

   - The revaluation was done on instructions from the Ministry of Finance because the total net worth of the enterprise had become negative. This is an unacceptable accounting transaction which distorts the true net worth of the enterprise.

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 0.88

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 160 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Supporting Schedules and Accounting Errors

   - Supporting schedules are not available for spare parts, debtors, creditors, accounts receivables, etc.

   - Some of the numbers do not add up on the statements.

2. Accounts Receivables

   - There are no supporting schedules for accounts receivables.

   - There has been a significant increase in A/C from Birr 6.8 million in FY 1994 to Birr 16.0 million in FY 1995.

3. Sales Revenue

   - There has been a significant increase in sales from Birr 20.7 million in FY 1993, to Birr 30.2 million in FY 1994, to Birr 41.0 million in FY 1995.

EXHIBIT A-15.

BAHIR DAR TEXTILE FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	66,914,628	66,915,278	66,969,170
- Movable	2,047,946	2,087,172	2,090,491
	68,962,574	69,002,450	69,059,661
A/Depreciation : - Immovable	4,153,231	10,625,799	17,122,725
- Movable	200,447	488,481	776,515
	4,353,678	11,114,280	17,899,240
NET FIXED ASSETS	64,608,896	57,888,170	51,160,421
DEFERRED EXPENDITURE	1,407,528	973,516	36,750
	66,016,424	58,861,686	51,197,171
CURRENT ASSETS:			
Cash	2,506,641	481,252	1,771,238
Trade Debtors	997,801	997,801	3,481,513
Associated & Other Debtors	8,665,384	5,848,974	12,539,259
TOTAL DEBTORS	9,663,185	6,846,775	16,020,772
STOCK - Finished Goods	9,892,221	14,119,358	17,959,228
General Stores	10,004,192	14,559,338	6,288,367
Inputs	8,027,359	9,984,819	10,290,459
Goods in Transit	2,773,840	1,365,684	2,398,050
WIP	4,364,077	5,551,627	7,786,719
TOTAL STOCK	35,061,689	45,580,826	44,722,823
TOTAL CURRENT ASSETS	47,231,515	52,908,853	62,514,833
TOTAL ASSETS	113,247,939	111,770,539	113,712,004
CURRENT LIABILITIES :			
Trade Creditors	6,847,396	6,068,392	3,999,266
Overdraft			
Other Creditors	23,395,805	10,433,612	9,602,904
Taxes & Cont.(p.tax,st.div.,cap.ch,res	11,206,200	16,852,852	24,601,372
Curr.Mat.LTD.- AID Bank	2,898,000	2,898,000	2,898,000
Curr.Mat.LTD.- Others	5,509,740	5,509,740	5,509,740
AID BANK - Short T.Loan	850,904		358,978
Other - Short T.Loan	3,139,583	1,649,088	1,614,703
Associated Enterp.	4,678,305	5,541,676	6,508,332
Interest Payable	11,300,702	13,632,431	15,964,160
Other Provisions/Differed liab.	364,245	(159,256)	(246,556)
TOTAL CURRENT LIABILITIES	70,190,880	62,426,535	70,810,899
NET WORKING CAPITAL	(22,959,365)	(9,517,682)	(8,296,066)
LONG TERM LIABILITIES			
AID BANK LOAN	5,395,763	5,395,763	5,395,763
OTHER LONG TERM LOAN	11,025,411	11,025,411	11,025,411
	16,421,174	16,421,174	16,421,174
TOT.CUR.& LT LIAB.	86,612,054	78,847,709	87,232,073
NET-EQUITY			
STATE CAPITAL	40,432,000	61,997,000	61,997,000
State Grant			
GENERAL RESERVE/(accum.def).	(13,796,115)	(29,071,170)	(35,517,069)
Loan redemp.reserve			
TOTAL NET EQUITY	26,635,885	32,925,830	26,479,931
TOTAL LIAB.& CAPITAL	113,247,939	111,773,539	113,712,004

204

EXHIBIT A-16.

BAHIR DAR TEXTILE FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	20,703,016	30,241,276	41,014,984
LESS: SALES TAX			
	20,703,016	30,241,276	41,014,984
COST OF GOODS SOLD			
Direct Material Cost	10,282,107	17,603,352	19,277,344
Direct Labour Cost	4,480,425	4,093,569	4,537,761
Direct Machinery Use cost	16,288,283	17,431,041	15,023,330
Manufacturing OH Cost	2,124,417	4,134,697	5,335,562
Increase/Decrease in WIP	(2,628,892)	(1,187,550)	(2,235,092)
Increase/Decrease in Finished G.	(4,920,822)	(4,227,137)	(3,839,870)
	25,625,518	37,848,172	38,099,035
GROSS PROFIT(LOSS)	(4,922,502)	(7,606,896)	2,915,949
OTHER INCOME	469,336	338,476	354,799
	(4,453,166)	(7,268,420)	3,270,748
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	338,150	270,309	191,039
ADMINISTRATION	4,093,685	4,448,156	5,035,203
CORPORATION LEVY	57,931		
INTEREST	2,816,151	2,734,826	2,880,151
CAPITAL CHARGE			
AUDIT FEE	18,993	18,993	18,993
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS			
	7,324,910	7,472,284	8,125,386
OPERATING NET PROF.(LOSS)	(11,778,076)	(14,740,704)	(4,854,638)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	(11,778,076)	(14,740,704)	(4,854,638)

DEBRE BIRHAN BLANKET FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially sound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

- Profit (after tax) of Birr 6.0 million in FY 1995
- The factory made a profit during each of the last three years.

2. Net Worth

- The balance sheet for FY 1995 shows a net worth of Birr 15.4 million.
- The above may fairly reflect the worth of the business.

3. Net Working Capital/Liquidity

- Positive figure of Birr 5.0 million for FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

- Birr 7.3 million as of June 30, 1995
- Birr 8.6 million as of March 1996

2. Amount of Long-Term Loans

- Birr 6.0 million as of June 30, 1995

3. Debt-Equity Ratio (total liabilities divided by net worth)

- 226 percent

4. Re-valuation of Assets

- Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

- 1.18

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 29 days of stock available

   - One month finished goods inventory is reasonable given the current market environment in the country.

7. Net Margin (profit after taxes divided by net sales)

   - 12 percent

8. Return on Assets (profit after taxes divided by total assets)

   - 12 percent

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Trade Debtors

   - The supporting schedules for the A/C Trade Debtors differ considerably from the information presented in the balance sheet.

	Balance Sheet	Schedules
FY 1993	Birr 6,058,000	Birr 1,513,000
FY 1994	Birr 12,623,000	Birr 2,864,000
FY 1995	Birr 2,826,000	Birr 725,000

EXHIBIT A-17.

DEBRE BIRHAN BLANKET FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	27,917,000	28,742,000	31,244,000
- Movable	285,000	285,000	298,000
	28,202,000	29,027,000	31,542,000
A/Depreciation : - Immovable	9,842,000	12,490,000	15,321,000
- Movable	214,000	235,000	257,000
	10,056,000	12,725,000	15,578,000
NET FIXED ASSETS	18,146,000	16,302,000	15,964,000
DEFERRED EXPENDITURE	726,000	533,000	344,000
	18,872,000	16,835,000	16,308,000
CURRENT ASSETS:			
Cash	6,747,000	535,000	487,000
Trade Debtors	6,058,000	12,623,000	2,826,000
Associated & Other Debtors	1,379,000	1,423,000	1,308,000
TOTAL DEBTORS	7,437,000	14,046,000	4,134,000
STOCK - Finished Goods	2,673,000	4,750,000	4,095,000
General Stores	8,061,000	6,417,000	13,347,000
Inputs			
Goods in Transit	1,635,000	4,969,000	10,520,000
WIP	452,000	1,000,000	1,092,000
TOTAL STOCK	12,821,000	17,136,000	29,054,000
TOTAL CURRENT ASSETS	27,005,000	31,717,000	33,675,000
TOTAL ASSETS	45,877,000	48,552,000	49,983,000
CURRENT LIABILITIES :			
Trade Creditors	7,325,000	3,774,000	3,031,000
Overdraft		7,987,000	7,252,000
Other Creditors			
Taxes & Cont.(p.tax,st.div.,cap.ch,res	5,375,000	7,205,000	5,219,000
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others	6,034,000	2,414,000	1,207,000
AID BANK - Short T.Loan			
Other - Short T.Loan	2,075,000		
Associated Enterp.	716,000	889,000	1,358,000
Interest Payable			
Other Provisions/Differed liab.	3,906,000	5,993,000	10,569,000
TOTAL CURRENT LIABILITIES	25,431,000	28,262,000	28,636,000
NET WORKING CAPITAL	1,574,000	3,455,000	5,039,000
LONG TERM LIABILITIES			
AID BANK LOAN			
OTHER LONG TERM LOANS	8,448,000	7,241,000	6,034,000
	8,448,000	7,241,000	6,034,000
TOT.CUR.& LT LIAB.	33,879,000	35,503,000	34,670,000
NET-EQUITY			
STATE CAPITAL	4,607,000	4,607,000	4,607,000
State Grant			
GENERAL RESERVE/(accum.def).	7,391,000	8,442,000	10,706,000
Loan redemp.reserve			
TOTAL NET EQUITY	11,998,000	13,049,000	15,313,000
TOTAL LIAB.& CAPITAL	45,877,000	48,552,000	49,983,000

EXHIBIT A-18.

DEBRE BIRHAN BLANKET FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	31,048,000	50,175,000	51,290,000
LESS: SALES TAX			
	31,048,000	50,175,000	51,290,000
COST OF GOODS SOLD			
Direct Material Cost	11,708,000	24,618,000	27,378,000
Direct Labour Cost	1,732,000	2,192,000	2,343,000
Direct Machinery Use cost	4,635,000	4,745,000	6,153,000
Manufacturing OH Cost	956,000	4,054,000	1,095,000
Increase/Decrease in WIP	260,000	(548,000)	(92,000)
Increase/Decrease in Finished G.	(2,033,000)	(2,076,000)	655,000
	17,258,000	32,985,000	37,532,000
GROSS PROFIT(LOSS)	13,790,000	17,190,000	13,758,000
OTHER INCOME	109,000	170,000	619,000
	13,899,000	17,360,000	14,377,000
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION			
ADMINISTRATION	1,098,000	1,505,000	1,697,000
CORPORATION LEVY	79,000		
INTEREST	1,551,000	1,230,000	1,530,000
CAPITAL CHARGE	133,000		
AUDIT FEE	21,000	30,000	30,000
PROVISION FOR STOCK OBSOL.		3,963,000	542,000
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES	11,000	16,000	18,000
OTHERS	193,000	193,000	193,000
	3,086,000	6,937,000	4,010,000
OPERATING NET PROF.(LOSS)	10,813,000	10,423,000	10,367,000
Prior Year Adjustment	(164,000)	(183,000)	
Profit Tax	5,325,000	7,101,000	4,364,000
NET PROFIT(LOSS) After TAX	5,324,000	3,139,000	6,003,000

DIRE DAWA TEXTILE FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Loss of Birr 8.5 million in FY 1995

   - Lost money in two of the last three years

2. Net Worth

   - Positive net worth of Birr 35.3 million in FY 1995 according to financial statements.

   - But a revaluation of the assets indicates the net worth of the enterprise is negative or close to zero (see Annex B for a detailed analysis of the Dire Dawa Textile Enterprise).

3. Net Working Capital/Liquidity

   - Positive figure of Birr 24.4 million for FY 1995

   - But a large amount of current assets (e.g., associated enterprise debts, inventory, spare parts, etc.) may be overstated and are unavailable for cash flow purposes. Therefore, although the books show a positive net working capital, in reality the enterprise is experiencing a liquidity problem.

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - Birr 8.9 million as of March 1996

2.. Amount of Long-Term Loans

   - None

   - Although there are no long-term loans, several of the short-term loans have been outstanding long enough to consider them long-term, e.g., Birr 18.9 million owed to the Ministry of Finance in 1994 for American cotton, and Birr 1.0 million owed to the China National Textile since 1990.

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 218 percent

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 1.3 (See note above on Net Working Capital)

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365)

   - 72 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Inventory and Spare Parts Valuation

   - It appears both the inventory and spare parts are overvalued on the balance sheet for the enterprise. Examples: Some of the twill fabric contained in the inventory will have to be sold at a discount; some spare parts have deteriorated; and in some cases the amount of spare parts held in inventory would supply the plant's needs for over 30 years.

2. Accounts Receivables

   - Some of the long standing A/R's should be written off the books. For example, the Asmara Textile factory has owed Birr 2.5 million since 1986. Since Eritrea became independent from Ethiopia four years ago, it may be unlikely that this debt will be repaid. In either case, it is certainly not a current A/R which would be available for net working capital.

3. Outstanding Loans to the Distributor

   - The distributor which is used by the enterprise currently has over Birr 8 million in outstanding accounts payable to the enterprise. This large amount basically means that most of the Birr 10 million in overdrafts from the Commercial Bank are going to fund the distributor's operations. Therefore, these funds are not available for liquidity use by the enterprise.

EXHIBIT A-19.

DIRE DAWA TEXTILE FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	78,834,755	79,905,630	76,478,702
- Movable	4,873,640	4,526,499	7,892,640
	83,708,395	84,432,129	84,371,342
A/Depreciation : - Immovable	67,409,691	68,886,833	67,806,753
- Movable	3,580,572	3,666,335	5,975,054
	70,990,263	72,553,168	73,781,807
NET FIXED ASSETS	12,718,132	11,878,961	10,589,535
DEFERRED EXPENDITURE	328,500		
	13,046,632	11,878,961	10,589,535
CURRENT ASSETS:			
Cash	1,659,496	336,198	182,467
Trade Debtors	1,704,958	4,951,884	8,452,050
Associated & Other Debtors	13,623,224	14,124,646	15,298,177
TOTAL DEBTORS	15,328,182	19,076,530	23,750,227
STOCK - Finished Goods	3,253,960	10,929,255	13,430,528
General Stores	19,311,008	27,048,753	27,260,109
Inputs	19,875,532	27,263,943	19,205,769
Goods in Transit	8,964,326	10,836,552	7,843,535
WIP	4,732,910	6,047,404	9,842,175
TOTAL STOCK	56,137,736	82,125,907	77,582,116
TOTAL CURRENT ASSETS	73,125,414	101,538,635	101,514,810
TOTAL ASSETS	86,172,046	113,417,596	112,104,345
CURRENT LIABILITIES :			
Trade Creditors	10,986,441	24,371,179	28,407,713
Overdraft	7,509,864	11,708,438	10,597,174
Other Creditors	26,503,975	9,665,210	9,818,618
Taxes & Cont.(p.tax,st.div.,cap.ch,res	17,525,753	19,288,336	23,655,031
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan			
Associated Enterp.		415,603	515,379
Interest Payable			
Other Provisions/Differed liab.	3,185,696	4,089,596	4,089,596
TOTAL CURRENT LIABILITIES	65,711,729	69,538,362	77,083,511
NET WORKING CAPITAL	7,413,685	32,000,273	24,431,299
LONG TERM LIABILITIES			
AID BANK LOAN			
OTHER AID B.LOAN			
	-	-	-
TOT.CUR.& LT LIAB.	65,711,729	69,538,362	77,083,511
NET-EQUITY			
STATE CAPITAL	23,952,000	47,272,000	47,272,000
State Grant			
GENERAL RESERVE/(accum.def).	(3,491,671)	(3,064,262)	(11,922,666)
Loan redemp.reserve			
TOTAL NET EQUITY	20,460,329	44,207,738	35,349,334
TOTAL LIAB.& CAPITAL	86,172,058	113,746,100	112,432,845

EXHIBIT A-20.

DIRE DAWA TEXTILE FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	40,258,031	78,911,066	67,820,746
LESS: SALES TAX			
	40,258,031	78,911,066	67,820,746
COST OF GOODS SOLD			
Direct Material Cost	22,100,643	41,319,699	41,681,483
Direct Labour Cost	15,374,140	18,174,467	15,859,929
Direct Machinery Use cost	5,856,742	7,357,495	6,507,400
Manufacturing OH Cost	12,167,867	17,933,837	17,301,816
Increase/Decrease in WIP	(87,133)	(1,314,494)	(3,794,770)
Increase/Decrease in Finished G.	(2,943,624)	(8,865,436)	(3,159,506)
	52,468,635	74,605,568	74,396,352
GROSS PROFIT(LOSS)	(12,210,604)	4,305,498	(6,575,606)
OTHER INCOME	2,762,347	4,500,394	4,422,492
	(9,448,257)	8,805,892	(2,153,114)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	57,727	70,481	76,322
ADMINISTRATION	4,137,292	4,653,219	4,646,760
CORPORATION LEVY	108,513		
INTEREST	922,677	1,445,417	1,621,643
CAPITAL CHARGE	246,089		
AUDIT FEE	45,000	36,000	36,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES	15,628	18,204	32,267
OTHERS	56,369		
	5,589,295	6,223,321	6,412,992
OPERATING NET PROF.(LOSS)	(15,037,552)	2,582,571	(8,566,106)
Prior Year Adjustment	785,639	1,662,212	(292,295)
Tax on Profit		1,291,285	
NET PROFIT(LOSS) After TAX	(14,251,913)	2,953,498	(8,858,401)

EDGET YARN AND SEWING THREAD FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially intermediate

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Lost Birr 2.5 million in FY 1995
   - But registered profits in the two previous years

2. Net Worth

   - Positive Birr 2.0 million in FY 1995, which represents a drop from the FY 1994 level of Birr 15.6 million.
   - It is not clear why the state capital was reduced to Birr 9.2 million in FY 1995 from its level of Birr 17.9 million in FY 1994.

3. Net Working Capital/Liquidity

   - Negative Birr 1.2 million in FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - None

2. Amount of Long-Term Loans

   - Birr 37.2 million in FY 1995

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 2700 percent

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 0.94

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 68 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Plant Renovation

   - The Chinese assisted in the renovation of part of the factory between FY 1993 and 1994. During that time, the net fixed asset value increased by Birr 31.4 million while the other loans outstanding increased from zero to Birr 27.3 million.

   - Also, during the same time, the plant went from making a profit in FY 1993 and FY 1994 to losing funds in FY 1995.

2. Accounting Errors and Supporting Schedules

   - Supporting schedules for general stores have not been provided.

   - Supporting schedules for several items such as finished goods and work in process did not agree with the balance sheet.

   - The figures for finished goods on the profit and loss statement did not tie with those on the balance sheet.

EXHIBIT A-21.

EDGET YARN AND SEWING THREAD FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	17,345,397	51,203,126	51,776,377
- Movable	848,436	1,712,693	1,453,338
	18,193,833	52,915,819	53,229,715
A/Depreciation : - Immovable	7,263,439	10,502,750	13,741,863
- Movable	676,765	773,977	874,972
	7,940,204	11,276,727	14,616,835
NET FIXED ASSETS	10,253,629	41,639,092	38,612,880
DEFERRED EXPENDITURE	528,860	931,116	289,098
	10,782,489	42,570,208	38,901,978
CURRENT ASSETS:			
Cash	127,202	1,044,069	127,623
Trade Debtors	12,750	80,171	601,327
Associated & Other Debtors	1,023,737	804,261	723,903
TOTAL DEBTORS	1,036,487	884,432	1,325,230
STOCK-Finished Goods	547,580	6,797,064	3,300,758
General Stores	2,377,941	3,738,659	4,405,136
Inputs	3,691,373	7,952,947	7,177,356
Goods in Transit	2,519,412	458,528	514,873
WIP	69,927	863,209	745,489
TOTAL STOCK	9,206,233	19,810,407	16,143,612
TOTAL CURRENT ASSETS	10,369,922	21,738,908	17,596,465
TOTAL ASSETS	21,152,411	64,309,116	56,498,443
CURRENT LIABILITIES :			
Trade Creditors	5,015,651	2,393,938	7,160,354
Overdraft			
Other Creditors	1,746,461	6,719,863	6,199,550
Taxes & Cont.(p.tax,st.div.,cap.ch,res	1,501,869	2,993,087	468,068
Curr.Mat.LTD.- AID Bank	3,899,367	3,703,274	560,800
Curr.Mat.LTD.- Others	1,104,480	1,104,480	1,104,480
AID BANK - Short T.Loan			
Other - Short T.Loan	144,722		726,419
Associated Enterp.	613,556		2,500,919
Interest Payable	2,230,972	231,612	84,378
Other Provisions/Differed liab.			
TOTAL CURRENT LIABILITIES	16,257,078	17,146,254	18,804,968
NET WORKING CAPITAL	(5,887,156)	4,592,654	(1,208,503)
LONG TERM LIABILITIES			
AID BANK LOAN	5,698,407	4,255,644	3,705,500
OTHER LONG TERM LOANS		27,305,469	33,497,256
	5,698,407	31,561,113	37,202,756
TOT.CUR.& LT LIAB.	21,955,485	48,707,367	56,007,724
NET-EQUITY			
STATE CAPITAL	3,493,011	17,948,254	9,198,491
State Grant			
GENERAL RESERVE/(accum.def).	(3,301,723)	(2,346,315)	(7,128,177)
Loan redemp.reserve			
TOTAL NET EQUITY	191,288	15,601,939	2,070,314
TOTAL LIAB.& CAPITAL	22,146,773	64,309,306	58,078,038

EXHIBIT A-22.

EDGET YARN AND SEWING THREAD FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	12,873,546	17,770,095	17,619,447
LESS: SALES TAX			
	12,873,546	17,770,095	17,619,447
COST OF GOODS SOLD			
Direct Material Cost	6,051,700	10,662,533	7,190,064
Direct Labour Cost	1,153,564	1,397,977	1,516,550
Direct Machinery Use cost			
Manufacturing OH Cost	3,737,536	6,577,264	6,896,336
Increase/Decrease in WIP	(36,248)	(793,282)	117,720
Increase/Decrease in Finished G.	(464,784)	(4,969,718)	2,546,469
	10,441,768	12,874,774	18,267,139
GROSS PROFIT(LOSS)	2,431,778	4,895,321	(647,692)
OTHER INCOME	81,145	106,114	585,802
	2,512,923	5,001,435	(61,890)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION		29,361	13,627
ADMINISTRATION	1,190,303	1,364,977	1,495,155
CORPORATION LEVY	1,029		
INTEREST	839,323	941,211	757,699
CAPITAL CHARGE			
AUDIT FEE	15,840	15,840	17,600
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES		17,155	20,995
OTHERS	130,148	263,248	130,148
	2,176,643	2,631,792	2,435,224
OPERATING NET PROF.(LOSS)	336,280	2,369,643	(2,497,114)
Prior Year Adjustment			
Profit Tax	168,140	285,333	
NET PROFIT(LOSS) After TAX	168,140	2,084,310	(2,497,114)

GULELIE GARMENT FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

- Losses of Birr 851,112 in FY 1995 and Birr 1.4 million in FY 1994
- Profit of Birr 924,189 in FY 1993

2. Net Worth

- Birr 2.5 million in FY 1995
- The enterprise was provided with American Cotton credit of Birr 4.0 million in 1994.
- Before this the net worth was negative in FY 1993 and FY 1994. Therefore, without this credit the enterprise would have been effectively bankrupt.

3. Net Working Capital/Liquidity

- Birr 4.9 million in FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

- Birr 2.1 million as of March 1996

2. Amount of Long-Term Loans

- Birr 3.4 million in FY 1995

3. Debt-Equity Ratio (total liabilities divided by net worth)

- 390 percent

4. Re-valuation of Assets

- Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

- 1.75

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 145 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Inventory

   - Finished goods inventory at Birr 2.7 million is high given the size of their operations.

EXHIBIT A-23.

GULELE GARMENT FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	2,158,280	2,158,280	2,158,280
- Movable	704,923	718,683	931,060
	2,863,203	2,876,963	3,089,340
A/Depreciation : - Immovable	1,429,507	1,551,718	1,668,709
- Movable	367,089	395,401	432,350
	1,796,596	1,947,119	2,101,059
NET FIXED ASSETS	1,066,607	929,844	988,281
DEFERRED EXPENDITURE			
	1,066,607	929,844	988,281
CURRENT ASSETS:			
Cash	503,562		
Trade Debtors	3,112,952	2,925,642	3,425,084
Associated & Other Debtors	2,074,202	1,995,506	1,707,197
TOTAL DEBTORS	5,187,154	4,921,148	5,132,281
STOCK - Finished Goods	1,737,731	1,818,354	2,691,190
General Stores	328,125	496,530	578,223
Inputs	2,142,225	2,705,551	2,976,799
Goods in Transit	88,139	306,902	88,435
WIP			
TOTAL STOCK	4,296,220	5,327,337	6,334,647
TOTAL CURRENT ASSETS	9,986,936	10,248,485	11,466,928
TOTAL ASSETS	11,053,543	11,178,329	12,455,209
CURRENT LIABILITIES :			
Trade Creditors	665,676	430,552	1,054,014
Overdraft			
Other Creditors			
Taxes & Cont.(p.tax,st.div.,cap.ch,res	369,144	363,442	295,450
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan	201,818	678,378	1,667,655
Associated Enterp.	4,245,580	4,083,914	1,227,843
Interest Payable			
Other Provisions/Differed liab.	2,602,936	2,311,926	2,309,060
TOTAL CURRENT LIABILITIES	8,085,154	7,868,212	6,554,022
NET WORKING CAPITAL	1,901,782	2,380,273	4,912,906
LONG TERM LIABILITIES			
AID BANK LOAN	3,360,306	3,360,306	3,360,306
OTHER LONG TERM LOANS			
	3,360,306	3,360,306	3,360,306
TOT.CUR.& LT LIAB.	11,445,460	11,228,518	9,914,328
NET-EQUITY			
STATE CAPITAL	345,400	345,400	4,322,400
State Grant			
GENERAL RESERVE/(accum.def).	(737,317)	(395,589)	(1,781,519)
Loan redemp.reserve			
TOTAL NET EQUITY	(391,917)	(50,189)	2,540,881
TOTAL LIAB.& CAPITAL	11,053,543	11,178,329	12,455,209

EXHIBIT A-24.

GULELE GARMENT FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	7,381,386	3,579,965	6,794,483
LESS: SALES TAX			
	7,381,386	3,579,965	6,794,483
COST OF GOODS SOLD			
Direct Material Cost	4,667,352	3,005,416	5,124,159
Direct Labour Cost	977,057	840,655	25,111
Direct Machinery Use cost			
Manufacturing OH Cost	1,078,995	1,208,221	1,852,229
Increase/Decrease in WIP	13,871	2,208	326,073
Increase/Decrease in Finished G.	(36,799)	(1,028,059)	(650,717)
	6,700,476	4,028,441	6,676,855
GROSS PROFIT(LOSS)	680,910	(448,476)	117,628
OTHER INCOME	257,518	63,129	205,400
	938,428	(385,347)	323,028
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	209,339	226,789	334,242
ADMINISTRATION	626,768	573,072	546,836
CORPORATION LEVY	24,934		
INTEREST	45,270	174,082	263,717
CAPITAL CHARGE	2,878		
AUDIT FEE	15,000	15,000	15,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			14,345
OTHERS			
	924,189	988,943	1,174,140
OPERATING NET PROF.(LOSS)	14,239	(1,374,290)	(851,112)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	14,239	(1,374,290)	(851,112)

KOMBOLCHA TEXTILE FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Lost Birr 11.3 million in FY 1995

   - The enterprise has been losing over the years resulting in an accumulated deficit of Birr 106.6 million.

2. Net Worth

   - Birr 15.3 million in FY 1995

   - A projection of their operations indicates their net worth will turn negative in FY 1997.

3. Net Working Capital/Liquidity

   - Birr 12.4 million in FY 1995.

   - The actual amount of liquidity may be lower due to the large amounts of funds outstanding, e.g., debtors at Birr 47.7 million and general stores at Birr 10.8 million.

   - Two additional items may indicate liquidity is lower; i.e., as of the end of FY 1995 there was no cash on hand, and the amount of interest payable grew to Birr 37.1 million.

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - Birr 12.3 million as of March 1996

2. Amount of Long-Term Loans

   - Birr 102.8 million in FY 1995

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 1200 percent

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 1.15

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 67 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Supporting Schedules

   - There is some confusion with missing supporting schedules and some figures for existing schedules do not tie to financial statements.

2. Outstanding Loans to the Distributor

   - Part of the enterprise's working capital is used to fund the operations of its distributors. D.H. Geda owes the enterprise Birr 4.5 million and Sidco owes the enterprise Birr 2.5 million.

   - This results in lowering the amount of working capital available to the enterprise.

3. Sales Revenue

   - There has been a significant increase in sales from Birr 19.0 million in FY 1993, to Birr 33.5 million in FY 1994, to Birr 40.1 million in FY 1995.

EXHIBIT A-25.

KOMBOLCHA TEXTILE FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	186,191,173	186,225,000	186,328,000
- Movable	3,659,394	3,177,000	3,177,000
	189,850,567	189,402,000	189,505,000
A/Depreciation : - Immovable	64,579,058	74,689,000	85,611,000
- Movable	2,793,641	2,736,000	2,820,000
	67,372,699	77,425,000	88,431,000
NET FIXED ASSETS	122,477,868	111,977,000	101,074,000
DEFERRED EXPENDITURE	4,295,390	4,567,000	4,567,000
	126,773,258	116,544,000	105,641,000
CURRENT ASSETS:			
Cash	62,229	2,924,000	
Trade Debtors	1,088,607	3,800,000	6,946,000
Associated & Other Debtors	16,958,868	24,003,000	40,795,000
TOTAL DEBTORS	18,047,475	27,803,000	47,741,000
STOCK - Finished Goods	9,716,111	12,138,000	7,422,000
General Stores	10,808,400	7,648,000	10,858,000
Inputs	12,541,664	17,186,000	10,109,000
Goods in Transit	2,268,613	1,891,000	3,045,000
WIP	9,320,475	17,385,000	16,378,000
TOTAL STOCK	44,655,263	56,248,000	47,812,000
TOTAL CURRENT ASSETS	62,764,967	86,975,000	95,553,000
TOTAL ASSETS	189,538,225	203,519,000	201,194,000
CURRENT LIABILITIES :			
Trade Creditors	7,218,391	8,112,000	8,190,000
Overdraft			
Other Creditors	15,510,105	12,393,000	11,136,000
Taxes & Cont.(p.tax,st.div.,cap.ch,res	2,559,021	8,009,000	14,733,000
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan	3,409,369	879,000	
Other - Short T.Loan	14,094,263	12,988,000	8,268,000
Associated Enterp.	1,474,534	1,684,000	2,884,000
Interest Payable	28,583,778	32,838,000	37,092,000
Other Provisions/Differed liab.		848,000	848,000
TOTAL CURRENT LIABILITIES	72,849,461	77,751,000	83,151,000
NET WORKING CAPITAL	(10,084,494)	9,224,000	12,402,000
LONG TERM LIABILITIES			
AID BANK LOAN	24,337,649	23,838,000	23,838,000
OTHER LONG TERM LOAN	80,039,159	78,943,000	78,943,000
	104,376,808	102,781,000	102,781,000
TOT.CUR.& LT LIAB.	177,226,269	180,532,000	185,932,000
NET-EQUITY			
STATE CAPITAL	99,959,950	121,839,000	121,839,000
State Grant			
GENERAL RESERVE/(accum.def).	(87,647,994)	(98,852,000)	(106,577,000)
Loan redemp.reserve			
TOTAL NET EQUITY	12,311,956	22,987,000	15,262,000
TOTAL LIAB.& CAPITAL	189,538,225	203,519,000	201,194,000

EXHIBIT A-26.

KOMBOLCHA TEXTILE FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	19,035,473	33,535,000	40,121,000
LESS: SALES TAX			
	19,035,473	33,535,000	40,121,000
COST OF GOODS SOLD			
Direct Material Cost	10,161,973	21,664,000	13,319,000
Direct Labour Cost	1,843,393	2,027,000	2,092,000
Direct Machinery Use cost	14,644,382	15,954,000	14,954,000
Manufacturing OH Cost	5,386,791	6,114,000	5,790,000
Increase/Decrease in WIP	(3,417,008)	(8,065,000)	1,007,000
Increase/Decrease in Finished G.	(7,012,396)	(2,422,000)	4,716,000
	21,607,135	35,272,000	41,878,000
GROSS PROFIT(LOSS)	(2,571,662)	(1,737,000)	(1,757,000)
OTHER INCOME	249,438	717,000	690,000
	(2,322,224)	(1,020,000)	(1,067,000)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	25,443	174,000	227,000
ADMINISTRATION	3,851,535	4,363,000	4,366,000
CORPORATION LEVY	57,117		
INTEREST	5,791,656	5,564,000	5,541,000
CAPITAL CHARGE	125,125		
AUDIT FEE	60,000	55,000	60,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES	7,965	14,000	19,000
OTHERS	14,423	14,000	2,000
	9,933,264	10,184,000	10,215,000
OPERATING NET PROF.(LOSS)	(12,255,488)	(11,204,000)	(11,282,000)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	(12,255,488)	(11,204,000)	(11,282,000)

275

MIDDLE AWASH AGRICULTURAL DEVELOPMENT ENTERPRISE
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Profit of Birr 4.5 million in FY 1995.
   - However, it has been losing over the last seven years resulting in an accumulated deficit of Birr 134.2 million.

2. Net Worth

   - Negative Birr 103.3 million in FY 1995.

3. Net Working Capital/Liquidity

   - Negative Birr 23.5 million in FY 1995.

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - None

2. Amount of Long-Term Loans

   - Birr 116.2 million in long-term loans and an additional Birr 41.1 million in interest past due

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - Not applicable

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 0.85

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 220 days of stock available

7. Net Margin (profit after taxes divided by net sales)

    - 8.9 percent in FY 1995. Nothing in earlier years.

8. Return on Assets (profit after taxes divided by total assets)

    - 2.6 percent in FY 1995. Nothing in earlier years.

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Accounts Receivables

    - The total A/R figure has averaged Birr 75.3 million for the last three years, which is too high by any standard.

    - These should no longer be recorded in current assets, but moved to long-term loans receivables or written off if appropriate.

2. Accounting Errors

    - The balance sheet and profit and loss statement do not reconcile in the areas of work in process and finished goods.

EXHIBIT A-27.

MIDDLE AWASH AGRICULTURAL DEVELOPMENT ENTERPRISE
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	64,403,092	62,940,704	60,167,523
- Movable	35,820,083	37,226,536	35,586,326
	100,223,175	100,167,240	95,753,849
A/Depreciation : - Immovable	25,901,932	32,406,828	30,978,976
- Movable	32,759,474	29,740,382	28,430,014
	58,661,406	62,147,210	59,408,990
NET FIXED ASSETS	41,561,769	38,020,030	36,344,859
DEFERRED EXPENDITURE			
	41,561,769	38,020,030	36,344,859
CURRENT ASSETS:			
Cash	175,478	(620,925)	12,205,055
Trade Debtors	26,689,169	26,802,529	24,248,135
Associated & Other Debtors	43,548,816	35,495,011	34,469,459
TOTAL DEBTORS	70,237,985	62,297,540	58,717,594
STOCK - Finished Goods	12,088,069	31,492,982	30,064,487
General Stores	18,368,368	23,510,516	22,444,099
Inputs	5,146,968	3,753,982	3,583,704
Goods in Transit	-	-	-
WIP	2,016,941	2,856,394	8,065,666
TOTAL STOCK	37,620,346	61,613,874	64,157,956
TOTAL CURRENT ASSETS	108,033,809	123,290,489	135,080,605
TOTAL ASSETS	149,595,578	161,310,519	171,425,464
CURRENT LIABILITIES :			
Trade Creditors	73,026,960	76,358,062	74,317,586
Overdraft			
Other Creditors	15,323,418	17,623,880	17,152,927
Taxes & Cont.(p.tax,st.div.,cap.ch,res	18,490,281	18,876,426	25,418,484
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan			
Associated Enterp.			
Interest Payable	27,876,128	34,514,908	41,153,688
Other Provisions/Differed liab.	542,770	542,770	542,770
TOTAL CURRENT LIABILITIES	135,259,557	147,916,046	158,585,455
NET WORKING CAPITAL	(27,225,748)	(24,625,557)	(23,504,850)
LONG TERM LIABILITIES			
AID BANK LOAN	112,211,841	117,602,875	116,156,312
OTHER LONG TERM LOANS			
	112,211,841	117,602,875	116,156,312
TOT.CUR.& LT LIAB.	247,471,398	265,518,921	274,741,767
NET-EQUITY			
STATE CAPITAL	30,892,264	30,892,264	30,892,264
State Grant			
GENERAL RESERVE/(accum.def).	(128,768,084)	(135,100,666)	(134,208,567)
Loan redemp.reserve			
TOTAL NET EQUITY	(97,875,820)	(104,208,402)	(103,316,303)
TOTAL LIAB.& CAPITAL	149,595,578	161,310,519	171,425,464

EXHIBIT A-28.

MIDDLE AWASH AGRICULTURAL DEVELOPMENT ENTERPRISE
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	29,174,609	6,657,164	49,881,208
LESS: SALES TAX			
	29,174,609	6,657,164	49,881,208
COST OF GOODS SOLD			
Direct Material Cost	2,869,440	26,374	2,764,313
Direct Labour Cost	4,756,980	514,662	4,582,699
Direct Machinery Use cost	1,939,015	717,978	1,867,976
Farm OH Cost	21,067,493	10,936,041	20,295,645
Increase/Decrease in WIP			
Increase/Decrease in Finished G.	611,062		
	31,243,990	12,195,055	29,510,633
GROSS PROFIT(LOSS)	(2,069,381)	(5,537,891)	20,370,575
OTHER INCOME	619,895	553,203	1,183,585
	(1,449,486)	(4,984,688)	21,554,160
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	316,923	88,385	
ADMINISTRATION	4,310,084	2,846,222	7,400,480
CORPORATION LEVY	1,250,869		
INTEREST	6,568,607	4,188,589	6,683,523
CAPITAL CHARGE			
AUDIT FEE	35,000	35,000	36,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS			
	12,481,483	7,158,196	14,120,003
OPERATING NET PROF.(LOSS)	(13,930,969)	(12,142,884)	7,434,157
Prior Year Adjustment	458,376	(280,692)	
Profit Tax			2,973,663
NET PROFIT(LOSS) After TAX	(13,472,593)	(12,423,576)	4,460,494

NAZARETH GARMENT FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially intermediate

- Although losing money, the enterprise has a positive net worth and sales are increasing.

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Loss of Birr 1.5 million for FY 1995

   - Losses over the last three years totaling Birr 3.4 million

2. Net Worth

   - Positive Birr 20.5 million in FY 1995

3. Net Working Capital/Liquidity

   - Birr 212,000 in FY 1995

   - The current figure is a significant drop from FY 1993 of Birr 2.7 million, and FY 1994 of Birr 1.4 million.

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - Birr 2.4 million as of FY 1995

   - Birr 3.3 million as of March 1996

2. Amount of Long-Term Loans

   - None

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 33.5 percent

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 1.0

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 358 days of stock available.

   - This is much too high a level for finished goods.

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Supporting Schedules and Accounting Errors

   - Supporting schedules for trade debtors and other debtors are not available.

   - Supporting schedules for administrative expense are not in agreement with those shown in the profit and loss statement.

   - Figures for work in process and finished goods do not tie across the profit and loss and balance sheets.

2. Sales Revenue

   - There has been a significant increase in sales from Birr 1.1 million in FY 1993, to Birr 2.1 million in FY 1994, to Birr 3.2 million in FY 1995.

   - If the enterprise can keep up this growth in sales and try to reduce costs, then there is the potential for them to show a profit.

EXHIBIT A-29.

NAZARETH GARMENT FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	17,900,989	18,358,379	18,867,772
- Movable			159,620
	17,900,989	18,358,379	19,027,392
A/Depreciation : - Immovable	500,204	1,059,535	2,137,577
- Movable			18,376
	500,204	1,059,535	2,155,953
NET FIXED ASSETS	17,400,785	17,298,844	16,871,439
DEFERRED EXPENDITURE	2,666,855	2,963,883	3,391,602
	20,067,640	20,262,727	20,263,041
CURRENT ASSETS:			
Cash	906,378	50,110	79,154
Trade Debtors	47,052	60,429	421,422
Associated & Other Debtors	187,600	646,774	631,142
TOTAL DEBTORS	234,652	707,203	1,052,564
STOCK - Finished Goods	3,154,785	3,747,439	3,167,682
General Stores	370,780	432,752	554,823
Inputs	999,870	2,078,795	1,890,835
Goods in Transit			
WIP	277,237	205,268	327,036
TOTAL STOCK	4,802,672	6,464,254	5,940,376
TOTAL CURRENT ASSETS	5,943,702	7,221,567	7,072,094
TOTAL ASSETS	26,011,342	27,484,294	27,335,135
CURRENT LIABILITIES :			
Trade Creditors	2,675,136	2,914,567	3,028,904
Overdraft		1,730,894	2,440,994
Other Creditors	469,602	756,822	866,319
Taxes & Cont.(p.tax,st.div.,cap.ch,res	42,819	336,528	454,696
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan			
Associated Enterp.			
Interest Payable			
Other Provisions/Differed liab.	36,356	42,557	69,162
TOTAL CURRENT LIABILITIES	3,223,913	5,781,368	6,860,075
NET WORKING CAPITAL	2,719,789	1,440,199	212,019
LONG TERM LIABILITIES			
AID BANK LOAN			
OTHER LONG TERM LOAN			
	-	-	-
TOT.CUR.& LT LIAB.	3,223,913	5,781,368	6,860,075
NET-EQUITY			
STATE CAPITAL	23,475,278	23,477,228	23,656,577
State Grant			
GENERAL RESERVE/(accum.def).	(687,849)	(1,774,300)	(3,181,515)
Loan redemp.reserve			
TOTAL NET EQUITY	22,787,429	21,702,928	20,475,062
TOTAL LIAB.& CAPITAL	26,011,342	27,484,296	27,335,137

EXHIBIT A-30.

NAZARETH GARMENT FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	1,133,035	2,112,193	3,225,005
LESS: SALES TAX			
	1,133,035	2,112,193	3,225,005
COST OF GOODS SOLD			
Direct Material Cost	2,026,982	1,173,302	596,713
Direct Labour Cost	408,225	625,935	699,725
Direct Machinery Use cost			
Manufacturing OH Cost	794,159	960,849	1,551,598
Increase/Decrease in WIP	74,682	71,969	(121,767)
Increase/Decrease in Finished G.	(2,157,282)	(485,376)	797,965
	1,146,766	2,346,679	3,524,234
GROSS PROFIT(LOSS)	(13,731)	(234,486)	(299,229)
OTHER INCOME	48,234	120,445	110,968
	34,503	(114,041)	(188,261)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION	104,919	207,630	219,342
ADMINISTRATION	597,428	635,433	805,632
CORPORATION LEVY			
INTEREST		158,212	291,797
CAPITAL CHARGE			
AUDIT FEE	15,000	15,000	15,104
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES	5,000	12,813	12,640
OTHERS			
	722,347	1,029,088	1,344,515
OPERATING NET PROF.(LOSS)	(687,844)	(1,143,129)	(1,532,776)
Prior Year Adjustment		56,677	125,562
Profit Tax			
NET PROFIT(LOSS) After TAX	(687,844)	(1,086,452)	(1,407,214)

NEFAS SILK THREAD FACTORY
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

   - Loss of Birr 937,269 in FY 1995

   - Losses in all of the last three years totaling Birr 3.1 million

2. Net Worth

   - Negative Birr 3.1 million as of FY 1995

3. Net Working Capital/Liquidity

   - Negative Birr 3.5 million as of FY 1995

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - Birr 1.5 million in FY 1995

2. Amount of Long-Term Loans

   - None

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - Not applicable

4. Re-valuation of Assets

   - Not applicable

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 0.50

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 42 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Cost of Goods Sold

   - There are no supporting schedules available to analyze the details.

2. Accounting Errors

   - The accounting records provided by this enterprise had too many errors in math and many of the numbers did not tie to the supporting schedules when those schedules were available.

EXHIBIT A-31.

NEFAS SILK THREAD FACTORY
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable			
- Movable			
	3,004,124	3,004,124	3,004,382
A/Depreciation : - Immovable			
- Movable			
.	2,449,598	2,533,378	2,559,324
NET FIXED ASSETS	554,526	470,746	445,058
DEFERRED EXPENDITURE			
	554,526	470,746	445,058
CURRENT ASSETS:			
Cash	5,090	479	60
Trade Debtors	8,439	52,193	61,607
Associated & Other Debtors	775,122	622,462	596,766
TOTAL DEBTORS	783,561	674,655	658,373
STOCK - Finished Goods	878,686	443,919	338,288
General Stores	915,380	904,311	841,060
Inputs	1,615,966	1,897,016	1,638,641
Goods in Transit	575,474	15	15
WIP	292,068	145,428	103,514
TOTAL STOCK	4,277,574	3,390,689	2,921,518
TOTAL CURRENT ASSETS	5,066,225	4,065,823	3,579,951
TOTAL ASSETS	5,620,751	4,536,569	4,025,009
CURRENT LIABILITIES :			
Trade Creditors	126,601	143,322	110,626
Overdraft	1,392,867	1,390,891	1,533,101
Other Creditors	2,248,637	2,008,941	2,256,220
Taxes & Cont.(p.tax,st.div.,cap.ch,res	92,055	92,055	92,055
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan	857,231	324,966	65,888
Associated Enterp.	1,845,058	2,734,778	3,063,047
Interest Payable			
Other Provisions/Differed liab.			
TOTAL CURRENT LIABILITIES	6,562,449	6,694,953	7,120,937
NET WORKING CAPITAL	(1,496,224)	(2,629,130)	(3,540,986)
LONG TERM LIABILITIES			
AID BANK LOAN			
OTHER LONG TERM LOANS			
	-	-	-
TOT.CUR.& LT LIAB.	6,562,449	6,694,953	7,120,937
NET-EQUITY			
STATE CAPITAL	629,558	629,558	629,558
State Grant			
GENERAL RESERVE/(accum.def).	(1,571,256)	(2,787,942)	(3,725,486)
Loan redemp.reserve			
TOTAL NET EQUITY	(941,698)	(2,158,384)	(3,095,928)
TOTAL LIAB.& CAPITAL	5,620,751	4,536,569	4,025,009

EXHIBIT A-32.

NEFAS SILK THREAD FACTORY
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	2,485,172	2,722,576	2,959,898
LESS: SALES TAX			
	2,485,172	2,722,576	2,959,898
COST OF GOODS SOLD			
Direct Material Cost			
Direct Labour Cost			
Direct Machinery Use cost			
Manufacturing OH Cost			
Increase/Decrease in WIP			
Increase/Decrease in Finished G.			
	2,753,197	3,539,171	3,953,957
GROSS PROFIT(LOSS)	(268,025)	(816,595)	(994,059)
OTHER INCOME	246,852	288,747	820,828
	(21,173)	(527,848)	(173,231)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION			
ADMINISTRATION	664,255	541,885	520,974
CORPORATION LEVY	16,302		
INTEREST	130,752	235,931	214,010
CAPITAL CHARGE			
AUDIT FEE	24,200	16,500	16,500
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES	6,805	12,570	12,554
OTHERS			
	842,314	806,886	764,038
OPERATING NET PROF.(LOSS)	(863,487)	(1,334,734)	(937,269)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	(863,487)	(1,334,734)	(937,269)

NORTH OMO AGRICULTURAL DEVELOPMENT ENTERPRISE
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

- Loss of Birr 4.5 million in FY 1995
- Lost a total of Birr 15.1 million over the last three years

2. Net Worth

- Birr 53.8 million in FY 1995 according to the balance sheet
- But the net worth figure is highly questionable since in FY 1993 the net worth for the enterprise was negative Birr 51.8 million.
- The net worth figure has twice been changed in the accounting records:
  - In FY 1994, the value of fixed assets was raised from Birr 11.6 million to Birr 68.4 million.
  - In FY 1995, the value of fixed assets was increased an additional Birr 39.8 million to Birr 108.2 million.
- It appears that the changes in fixed asset value were the result of a revaluation of fixed assets (primarily land) and the merger with South Omo (see the following section on revaluation of assets).
- Increasing the net worth of the enterprise through the merger would be valid, but increasing the net worth through the revaluation of assets, especially land, would not.
- Therefore, the true net worth of North Omo is probably closer to zero although it is stated on the books at Birr 53.8 million.

3. Net Working Capital/Liquidity

- Negative Birr 59.5 million

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

   - None

2. Amount of Long-Term Loans

   - The amount on the books is insignificant; however, the annual interest expense of Birr 3.0 million and interest payable of Birr 22.6 million indicates that something is missing.

3. Debt-Equity Ratio (total liabilities divided by net worth)

   - 183 percent

4. Re-valuation of Assets

   - Land was revaluated in 1994 when the enterprise was merged and established. The following indicates the stated land values:

Birr	1,648,714	FY 1993
Birr	48,663,542	FY 1994
Birr	64,917,997	FY 1995

   - Since land is not owned in Ethiopia, nor can it be sold, it is unclear how land and its improvements could have value.
   - When the fixed assets were revalued upwards, it resulted in greater depreciation expense and therefore greater operating losses.
   - For additional information, see note above on net worth.

5. Liquidity/Current Ratio (current assets divided by current liabilities)

   - 0.39

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - Not applicable

7. Net Margin (profit after taxes divided by net sales)

   - None

8. Return on Assets (profit after taxes divided by total assets)

   - None

257

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Accounts Receivables

- The total accounts receivables figure is Birr 22.4 million; however, most of this is not liquid and should be re-classified as long-term or possibly written off.

- For example, the following table shows how little movement there has been in repayment of the debts by some of the associated enterprises:

	FY 1993	FY1994	FY 1995
Arba Minch Textile	4,830,736	4,830,736	4,830,736
Bahir Dar	1,479,927	1,479,927	1,479,927
Kombolcha	740,087	740,087	740,087
Dire Dawa	666,932	666,932	666,932
Awasa	596,810	596,810	596,810
Total	8,314,492	8,314,492	8,314,492

2. Accounts Payable

- Birr 64.0 million is owed to associated enterprises, a figure which is too high by any standard.

- Birr 22.6 million is owed for interest payable, which annualizes at seven years worth.

3. Supporting Schedules

- Some supporting schedules do no agree with the financial statements.

EXHIBIT A-33.

NORTH OMO AGRICULTURAL DEVELOPMENT ENTERPRISE
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	8,510,021	61,272,811	83,093,958
- Movable	3,086,990	7,105,200	25,061,055
	11,597,011	68,378,011	108,155,013
A/Depreciation : - Immovable	2,704,835	2,516,533	7,480,772
- Movable	2,681,767	2,860,824	9,255,034
	5,386,602	5,377,357	16,735,806
NET FIXED ASSETS	6,210,409	63,000,654	91,419,207
DEFERRED EXPENDITURE			22,293,728
	6,210,409	63,000,654	113,712,935
CURRENT ASSETS:			
Cash	485,532	693,961	1,623,106
Trade Debtors	10,433,983	-	-
Associated & Other Debtors	17,195,519	29,611,913	22,400,467
TOTAL DEBTORS	27,629,502	29,611,913	22,400,467
STOCK - Finished Goods			
General Stores	9,345,598	10,742,325	14,632,852
Inputs			
Goods in Transit			
WIP			
TOTAL STOCK	9,345,598	10,742,325	14,632,852
TOTAL CURRENT ASSETS	37,460,632	41,048,199	38,656,425
TOTAL ASSETS	43,671,041	104,048,853	152,369,360
CURRENT LIABILITIES :			
Trade Creditors	3,692,719	3,692,719	3,242,719
Overdraft			
Other Creditors			
Taxes & Cont.(p.tax,st.div.,cap.ch,res	1,933,681	2,192,000	2,057,000
Curr.Mat.LTD.- AID Bank			
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan	7,094,367	6,273,000	6,273,000
Associated Enterp.	66,526,151	69,769,294	64,041,358
Interest Payable	16,214,879	19,471,505	22,563,390
Other Provisions/Differed liab.			
TOTAL CURRENT LIABILITIES	95,461,797	101,398,518	98,177,467
NET WORKING CAPITAL	(58,001,165)	(60,350,319)	(59,521,042)
LONG TERM LIABILITIES			
AID BANK LOAN			364,104
OTHER LONG TERM LOANS			
	-	-	364,104
TOT.CUR.& LT LIAB.	95,461,797	101,398,518	98,541,571
NET-EQUITY			
STATE CAPITAL	1,112,000	1,112,000	53,561,257
State Grant			
GENERAL RESERVE/(accum.def).	(52,902,756)	1,538,335	266,532
Loan redemp.reserve			
TOTAL NET EQUITY	(51,790,756)	2,650,335	53,827,789
TOTAL LIAB.& CAPITAL	43,671,041	104,048,853	152,369,360

EXHIBIT A-34.

NORTH OMO AGRICULTURAL DEVELOPMENT ENTERPRISE
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	6,102,099	10,365,058	8,850,699
LESS: SALES TAX			
	6,102,099	10,365,058	8,850,699
COST OF GOODS SOLD			
Direct Material Cost	1,336,774	930,377	876,711
Direct Labour Cost	1,700,514	2,157,547	1,748,129
Direct Machinery Use cost	1,175,461	1,484,114	1,359,282
Farm OH Cost	5,003,006	5,968,626	5,580,755
Increase/Decrease in WIP			
Increase/Decrease in Finished G.			
	9,215,755	10,540,664	9,564,877
GROSS PROFIT(LOSS)	(3,113,656)	(175,606)	(714,178)
OTHER INCOME	63,462	0	0
	(3,050,194)	(175,606)	(714,178)
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION			
ADMINISTRATION	913,688	576,092	725,322
CORPORATION LEVY			
INTEREST	3,091,481	2,780,630	3,062,056
CAPITAL CHARGE			
AUDIT FEE	5,000	25,000	25,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS			
	4,010,169	3,381,722	3,812,378
OPERATING NET PROF.(LOSS)	(7,060,363)	(3,557,328)	(4,526,556)
Prior Year Adjustment			
Profit Tax			
NET PROFIT(LOSS) After TAX	(7,060,363)	(3,557,328)	(4,526,556)

TENDAHO AGRICULTURAL DEVELOPMENT ENTERPRISE
FINANCIAL DATA ANALYSIS

A. OVERALL CONDITION

- Financially unsound

B. MAJOR FINANCIAL INDICATORS

1. Profitability

- Profit of Birr 1.9 million in FY 1995
- Loss of Birr 23.3 million during FY 1993 and FY 1994
- As of FY 1995 the accumulated deficit was Birr 184.5 million

2. Net Worth

- Negative net worth of Birr 181.7 million as of FY 1995

3. Net Working Capital/Liquidity

- Negative figure of Birr 198.8 million

C. RATIOS AND ANALYSIS

1. Amount of Over Draft with Commercial Bank of Ethiopia

- None

2. Amount of Long-Term Loans

- Birr 6.6 million of long-term loans, and an additional Birr 150.2 million of long-term AID loans past due which were reclassified under current liabilities.

3. Debt-Equity Ratio (total liabilities divided by net worth)

- Not applicable

4. Re-valuation of Assets

- Not applicable.

5. Liquidity/Current Ratio (current assets divided by current liabilities)

- 0.18

6. Stock Turnover Rate (finished goods divided by net sales multiplied by 365 days)

   - 45 days of stock available

7. Net Margin (profit after taxes divided by net sales)

   - 4 percent for FY 1995. Nothing in other years.

8. Return on Assets (profit after taxes divided by total assets)

   - 2.7 percent for FY 1995. Nothing in other years.

D. ADDITIONAL SIGNIFICANT FINANCIAL REMARKS

1. Inventory and Spare Parts Valuation

   - There are no supporting schedules.
   - The figure of Birr 17.8 million for general stores seems high and could indicate an excess of spare parts or obsolete spare parts.

2. Price of Cotton

   - The Tendaho price of cotton has significantly increased since 1993,

Price in Birr per Qtl

	Lint Cotton	Cotton Seed	Linter Cotton
1993	619	23	150
1994	685	51	169

3. Sales of Cotton

   - Sales of Tendaho lint cotton have increased in quantity and value since FY 1994.

Sales of Lint Cotton

	Quantity	Value
1993	33,493 qtl	20,732,247 Birr
1994	22,951 qtl	15,713,629 Birr
1995	40,710 qtl	42,542,041 Birr

EXHIBIT A-35.

TENDAHO AGRICULTURAL DEVELOPMENT ENTERPRISE
COMPARATIVE BALANCE SHEET
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
Fixed Assets Cost: - Immovable	52,107,036	52,016,811	52,016,811
- Movable	24,667,357	24,365,299	25,215,299
	76,774,393	76,382,110	77,232,110
A/Depreciation : - Immovable	28,847,471	29,520,375	30,087,672
- Movable	22,567,286	23,093,697	23,537,492
	51,414,757	52,614,072	53,625,164
NET FIXED ASSETS	25,359,636	23,768,038	23,606,946
DEFERRED EXPENDITURE			
	25,359,636	23,768,038	23,606,946
CURRENT ASSETS:			
Cash	1,102,351	1,361,265	13,050,135
Trade Debtors	12,683,205	10,782,632	2,441,237
Associated & Other Debtors	10,732,691	2,346,661	1,964,031
TOTAL DEBTORS	23,415,896	13,129,293	4,405,268
STOCK - Finished Goods	5,913,261	5,619,495	5,635,238
General Stores	20,233,034	18,820,903	17,842,445
Inputs	1,629,976	1,955,971	2,992,636
Goods in Transit	30,407		
WIP	1,008,468	958,368	961,053
TOTAL STOCK	28,815,146	27,354,737	27,431,372
TOTAL CURRENT ASSETS	53,333,393	41,845,295	44,886,775
TOTAL ASSETS	78,693,029	65,613,333	68,493,721
CURRENT LIABILITIES :			
Trade Creditors	1,158,345	1,230,980	170,650
Overdraft			
Other Creditors	34,589,183	38,220,714	35,450,630
Taxes & Cont.(p.tax,st.div.,cap.ch,res	12,590,075	11,601,293	13,360,394
Curr.Mat.LTD.- AID Bank	142,936,453	148,454,291	150,205,563
Curr.Mat.LTD.- Others			
AID BANK - Short T.Loan			
Other - Short T.Loan	5,000,000	4,500,000	3,000,000
Associated Enterp.	13,301,754	10,573,389	8,701,600
Interest Payable	16,729,146	24,516,054	32,769,373
Other Provisions/Differed liab.			
TOTAL CURRENT LIABILITIES	226,304,956	239,096,721	243,658,210
NET WORKING CAPITAL	(172,971,563)	(197,251,426)	(198,771,435)
LONG TERM LIABILITIES			
AID BANK LOAN	24,183,553	8,795,923	6,558,795
OTHER LONG TERM LOANS			
	24,183,553	8,795,923	6,558,795
TOT.CUR.& LT LIAB.	250,488,509	247,892,644	250,217,005
NET-EQUITY			
STATE CAPITAL	16,958,800	2,742,000	2,742,000
State Grant			
GENERAL RESERVE/(accum.def).	(188,754,280)	(185,021,311)	(184,465,284)
Loan redemp.reserve			
TOTAL NET EQUITY	(171,795,480)	(182,279,311)	(181,723,284)
TOTAL LIAB.& CAPITAL	78,693,029	65,613,333	68,493,721

EXHIBIT A-36.

TENDAHO AGRICULTURAL DEVELOPMENT ENTREPRISE
COMPARATIVE PROFIT AND LOSS STATEMENT
(in Ethiopian Birr)

	FY 1992/93	FY 1993/94	FY 1994/95
NET SALES:			
GROSS SALES	21,656,787	17,030,613	45,853,048
LESS: SALES TAX			
	21,656,787	17,030,613	45,853,048
COST OF GOODS SOLD			
Direct Material Cost	5,014,370	3,070,572	7,396,631
Direct Labour Cost	7,023,351	3,889,659	7,401,170
Direct Machinery Use cost	4,356,951	2,640,266	3,901,830
Farm OH Cost	10,231,657	10,302,234	16,893,552
Increase/Decrease in WIP			
Increase/Decrease in Finished G.			
	26,626,329	19,902,731	35,593,183
GROSS PROFIT(LOSS)	(4,969,542)	(2,872,118)	10,259,865
OTHER INCOME	1,090,223	608,346	1,561,101
	(3,879,319)	(2,263,772)	11,820,966
SELLING ADM.& GENERAL			
SELLING & DISTRIBUTION			
ADMINISTRATION			
CORPORATION LEVY			
INTEREST	9,015,670	8,195,059	8,706,929
CAPITAL CHARGE			
AUDIT FEE	22,000	25,000	25,000
PROVISION FOR STOCK OBSOL.			
PROVISION FOR DOUBTFUL A/C			
BOARD MEMBER FEES			
OTHERS			
	9,037,670	8,220,059	8,731,929
OPERATING NET PROF.(LOSS)	(12,916,989)	(10,483,831)	3,089,037
Prior Year Adjustment			
Profit Tax			1,235,616
NET PROFIT(LOSS) After TAX	(12,916,989)	(10,483,831)	1,853,421

ANNEX B

DETAILED FINANCIAL ANALYSIS OF DIRE DAWA TEXTILE FACTORY

ANNEX B
DETAILED FINANCIAL ANALYSIS OF DIRE DAWA TEXTILE FACTORY

A. Introduction

The Dire Dawa Textile Factory was the enterprise chosen to provide a detailed case study of the financial and technical dimensions of the textile sector. Information was obtained from detailed financial records provided by the enterprise, along with interviews with the key management staff, including the general manager and head of finance. In addition, the financial and technical teams made an on-site visit to the factory during the week of 4 March 1996.

Since 1992, the Dire Dawa Textile Factory has moved in the direction of a more business-oriented, competitive enterprise. Progress has been made in the areas of marketing, business planning, reduction of the number of employees, and profit orientation. Unfortunately, it appears that outside factors are changing at a faster rate than those internal to the factory, resulting in extreme financial difficulties for the enterprise. It has lost money in two of the last three years. It recorded a loss of Br 8.5 million for FY 1995 and is projected to have a sizable operating loss for the current fiscal year.

B. General Financial Condition

The Dire Dawa Textile Factory was nationalized in 1974, but is presently run as a state owned public enterprise under Public Enterprise Proclamation No. 25/1992. The factory manufactures a variety of cotton fabrics and both acrylic and cotton yarns. Nothing is produced for export. The enterprise currently employees 4,831 employees; downsizing during the last year reduced the number of employees by 800-900.

The enterprise has produced a profit (on paper) in four out of the last ten years—FY 1986, FY 1987, FY 1988, and FY 1994. The only recent profit (Br 2.9 million in FY 1994) was the direct result of American cotton which was donated to Ethiopia and distributed to a number of textile factories with spinning capacity. Dire Dawa had a loss of Br 14.2 million in FY 1993 and a loss of Br 8.8 million in FY 1995. The enterprise is projected to lose approximately Br 15 million during the current fiscal year.

The Dire Dawa Factory, unlike many of the other domestic textile factories, does not have long-term loans outstanding. It does have major liquidity problems, however, with insufficient cash flow to purchase adequate raw material. The shortage of raw material is contributing to the plant operating at a reduced capacity, leading to further reductions in production and profit.

C. Accounting System

The accounting system used at the Dire Dawa Factory is a good manual system which follows generally accepted international accounting standards, including a double entry, full accrual bookkeeping system. However, this does not guarantee that their statements accurately portray the enterprise's financial condition. Their profit and loss statement is relatively accurate, but their balance sheet probably significantly overstates the value of assets, and therefore overstates the net worth of the factory. Sometimes following international guidelines alone is insufficient; analytical judgement must be made in the adjustment of questionable values.

The 1993 audit pointed out one of the questionable asset values when it disclaimed any figure for stock obsolescence since the factory had "no satisfactory procedure" for determining this amount. The same can also be said for fixed assets, inventory, spare parts, and chemicals. If a significant amount of the textile manufacturing equipment is broken beyond possible repair, or if portions of the twill inventory are not saleable, then it is necessary to develop methodology to account more accurately for these non-functioning assets. This annex presents an analysis of possible changes to the balance sheets and the resulting change to the net worth of the factory.

The financial statements which were used in this analysis were those prepared by the task force established by PESA. The task force designed the statement formats for the textile sector and distributed the forms to the enterprises which completed them. The resulting balance sheets, profit and loss statements, and supporting schedules were then cross checked by the task force with corrections made as necessary.

As for the financial statements submitted by the Dire Dawa Textile Factory, some corrections were made and some data did not agree with the 1993 audit. Nevertheless, the statements appear to be generally accurate; the errors are not considered significant. The last audit completed for Dire Dawa was for FY 1993; the audit for FY 1994 is currently being done.

D. Sales

Total sales at the factory have experienced an erratic up-and-down pattern. The factory experienced its highest sales volume in FY 1983, at Br 108.9 million. Since that time sales have declined to a low of Br 18.6 million in FY 1992, and are presently Br 67.8 million for FY 1995.

Part of that decline was due to economic and political conditions in the country. Also, before 1992, all textiles produced in the country were sold to the Ethiopian Domestic Distribution Corporation, which had responsibility for disposition. Since 1994, the factory has used the services of a private, sole distributor, D.H. Geda, to sell its goods in the market place.

The current low sales volume is due in part to the shortage of cash for the purchase of raw materials. Another causal factor is that the factory has been slow in making the transition from the manufacture of non-marketable products to those more desired by consumers. For example, the previous government required that this factory produce twill fabric for military uniforms. Much of the need for military uniforms ended in 1991, but the factory did not stop the production of twill until the later part of 1995. The value in the inventory of this twill fabric is presently Br 8.7 million.

Exhibit B-1 provides a comparison of manufacturing costs to selling prices for the major products produced by the factory. These figures were prepared by the finance department of the Dire Dawa Textile Factory and have not been independently audited. From these figures it appears that most of the yarns are making money while most of the fabrics are losing money; this conclusion is supported by the commercial manager of the enterprise.

Exhibit B-1. Dire Dawa Textile Factory:
Comparison of Unit Costs Versus Unit Selling Prices, FY 1995

Type of Product	Unit Measure	Unit Manufacture Cost (Br)	Unit Selling Price (Br)	Annual Sales Revenues (Br)
Cotton yarns				
Grey dir 21 WT	Kg	12.41	18.16	6,055,558
Grey dir 21 BT	Kg	12.38	18.16	---------
Grey dir 40 1x18	Kg	15.96	21.81	3,752,457
Bleached dir 401x18	Kg	17.53	25.23	12,778,417
Bleached dir 40 HT	Kg	18.03	31.58	150,379
Bleached dir 38	Kg	15.60	18.72	---------
Bleached dir 60 Nor	Kg	29.92	43.17	540,790
Bleached dir 60 HT	Kg	32.41	47.52	204,619
Grey yarn (c)-28	Kg	27.25	25.62	280,920
Grey yarn Kn-20	Kg	15.51	23.27	184,640
Acrylic yarns				
Dyed acrylic yarn 32/2	Kg	25.60	33.21	75,106
Dyed acrylic yarn 36/2	Kg	26.11	33.81	8,801,363
Fabrics				
Dyed © broad	Sq Meters	5.44	4.27	411,814
Bleached mohamudi	Sq Meters	4.45	3.93	1,970,889
Print poplin 2121	Sq Meters	5.02	3.93	1,176,308
Dyed French twill	Sq Meters	12.34	5.62	585,575
Print French twill	Sq Meters	8.34	7.57	5,228
Bleach new mull	Sq Meters	2.52	2.22	499,225
Grey sheeting	Sq Meters	2.56	2.71	13,434,632
Dyed bedsheet	Sq Meters	4.23	6.71	1,158,506
Dyed C-B poplin	Sq Meters	7.43	5.22	1,257,841
Dyed asnakech	Sq Meters	5.38	3.35	5,946,555
Print asnakech	Sq Meters	5.97	3.44	182,184

Source: Dire Dawa Textile Factory, Finance Department

E. Costs of Production

Although the current number of employees is 800-900 less than a year ago, it appears to even a casual observer that far too many employees are around the factory. Based on work loads, the technical team feels that the number of employees can still be reduced substantially.

A calculation of the average wage of the Dire Dawa factory worker is shown in Exhibit B-2. It was assumed that the average factory worker is paid Br 250 per month, receives the associated benefits, and works an average of 45 hours per week. Also included in the calculation was the actual FY 1995 cost of leave payments of 12.6 percent which included annual, sick, and other leave.

Exhibit B-2. Dire Dawa Textile Factory:
Average Wage Cost for Factory Worker

Component	Cost or Unit
1. Average factory worker wage	250 Br per month or US $ 39.37 per month
2. Employee benefits	@ 24 percent of wages
3. Work week	45 hours per week 7-1/2 hours per day, 6 days a week
4. Absentee rate	3.6 percent of time
5. Paid holidays per year (average)	13 days
6. Annual leave	1 year service - 15 days 2 years service - 16 days 3 years service - 18 days 4 years service - 20 days More than 5 years, one additional day, no limit
7. Sick leave	First month - 100 percent pay Next 35 days - 75 percent pay Next 45 days - 50 percent pay
8. **Average wage,** including benefits	1.82 Br per hour or 0.29 US$ per hour

These calculations result in an average employee wage of Br 1.82 per hour or US$ 0.29 per hour. Note that this average wage figure does not take into consideration down time of the plant or equipment.

Exhibit B-3 provides a breakdown of the production costs by major components. For FY 1995, 50 percent of the production costs were raw material while 19 percent were direct labor. It should be noted that the Dire Dawa Textile Factory uses an overhead cost distribution methodology which was developed 10-15 years ago. The percentages developed for this distribution are probably no longer applicable to the current activities at the plant. To ensure that component production cost estimates are useful, the accuracy of the distribution parameters should be updated.

In recent years, the price at which raw cotton is sold to the textile factories has increased from Br 7 per kilo, to Br 10.5 last year, to Br 11.4 at the present time. The current figure is in the vicinity of the world price of A Index cotton, as indicated by the A Index of cotton prices.

Exhibit B-3. Dire Dawa Textile Factory:
Production Costs by Major Component FY 1995

Expense	Cost (Million Br)	Percent of Total
1. Raw material (cotton, acrylic, dyes, chemicals, etc.)	41.7	50%
2. Direct labor	15.9	19%
3. Manufacturing overhead (indirect labor, indirect materials, etc.)	14.8	18%
4. Operating expense (admin., interest, etc.)	4.8	6%
5. Electrical power	3.9	4%
6. Direct machinery use (repairs, depreciation, etc.)	2.6	3%
Total	83.7	100%

F. Assets - Buildings and Equipment

The fixed assets for the Dire Dawa Textile Factory are stated at cost less accumulated depreciation. Maintenance, repairs, and minor renewals are charged to expenses as incurred. Major equipment renewals and upgrades are capitalized. There has been no recapitalization/reevaluation of fixed assets in this plant.

The following is the straight-line-basis schedule which is used for depreciation, which is considered reasonable:

Buildings	5 percent per annum
Water wells	10 percent per annum
Machinery and plant	16 percent first year and 12 percent per annum thereafter
Motor vehicles	20 percent per annum
Furniture and office equipment	10 percent per annum

Although the value of fixed assets has been recorded and depreciated properly on the enterprise's balance sheet, the question must be asked if there are extraordinary circumstances which would lead one to believe that the stated values do not reflect true values. Quite a few items of machinery and equipment have either never been used or have sat idle for many years. For example, five sets of knitting machines valued at about Br 451,000 have never been operated. Other equipment, including five pieces of electric boilers with a book value of about Br 800,000 have been idle for many years.

G. Inventory

It appears that factory inventory is overstated in value. According to the factory's accounting system, the stock of finished goods should be stated at the lower of cost or net realizable value. However, the most recent audit for FY 1993 disclaimed a value for stock obsolescence since the factory had no satisfactory procedure to determine this amount adequately.

With the ending of domestic strife and the establishment of a new Ethiopian government in 1991, there was no longer a need to produce so much twill fabric for military uniforms. Although the demand for such twill decreased greatly, the factory was slow in discontinuing the production line and continued to make additional twill until 1995. As a result, a large amount of non-saleable twill fabric is maintained in the inventory. As of March 3, 1996, the factory had a total inventory of finished goods of Br 17,480,015 of which Br 8,758,862 (or 50 percent) was twill fabric. Some of the twill has been in the inventory for three years.

This twill fabric will probably have to be sold for less than its current valuation in inventory. It still should be sold as soon as possible, for the following two reasons: (1) fabric in storage deteriorates over time, losing additional value; and (2) excessive long-term inventory results in interest carrying charges and a reduction in cash available for working capital.

H. Stock - Spare Parts and Inputs

The Dire Dawa Factory had a total inventory of spare parts of Br 22,667,000 as of the end of FY 1995. Initial stocks of spare parts, which were purchased the same time as the machinery, are capitalized and then depreciated over time. However, additional spare parts which were purchased independently of equipment are placed in inventory and carried as assets until they are used, and only then are they expensed. This amount of Br 22.7 million in spare parts has been purchased as replacement parts after the initial purchase of machinery; it appears to be excessive given their level of equipment. It is probably overstated on the balance sheet for the following reasons:

- **Stock obsolescence.** Some of the spare parts stock has been maintained in the warehouse for the last 10-15 years. For example, in one case it was noted that some of the rubber belts were very old, brittle, and non-usable. In another case, an inventory card was pulled showing 122 spring grips, revealing that between 1988 and March 1996, only 33 had been used. Anything kept in inventory that long should be either depreciated or expensed.

- **Excessive spare parts.** The original purchase price of the factory equipment is Br 84.3 million. Therefore Br 22.7 million in spare parts represents 27 percent of the equipment value. This figure is too high; a figure of 7-10 percent is appropriate for spare parts, or Br 5.9 - 8.4 million.

The general manager of the Dire Dawa Textile Factory identified two major problems in running the plant, i.e., the lack of (correct) spare parts for the many old machines and the lack of cash to purchase either parts or raw materials. The current excessive number of spare parts exacerbates both problems. In addition, carrying the unnecessary spare parts, using a 16 percent interest rate on the Br 22.7 million in spare parts inventory, results in an effective interest cost of Br 3.6 million annually.

I. Accounts Receivable

The factory has accounts receivable totaling Br 23.7 million. Some of these debts are non-collectable, while others that have been carried for a long time should not be recorded as current assets. The outstanding accounts receivables problems fall into three categories:

Trade Debtors - Br 8.5 million..A total of Br 7.9 million of this amount is owed by D.H. Geda, the sole distributor of finished goods for the factory. It is not a good situation for the enterprise to be short of cash while at the same time having a large loan outstanding to its distributor.

Last year the factory had a bank overdraft line with the Commercial Bank of Ethiopia (CBE) of Br 5 million. Now they have increased that overdraft to Br 10 million. It appears that the additional funds which they received from CBE were in effect transferred to the distributor. The distributor had provided the factory with a check in the amount of Br 8 million for them to hold, which means that he had effectively borrowed the Br 8 million without collateral. The distributor is only paying interest to the factory, but the factory needs the principal paid back as soon as possible. This is made clear by the fact that, in March 1996, the factory requested that the CBE increase its overdraft line to Br 15 million.

Associated Enterprise Debtors - Br 8.7 million. Out of the Br 8.7 million owed by associated enterprises, the viability of the following is questionable: the Asmara Textile Factory in Eritrea has owed Br 2.5 million since 1986; the Nefas Silk Sewing Thread Factory has owed Br 1.4 million for the last 3-4 years; and the National Textile Corporation (NTC), which no longer exists, owes Br 1.7 million.

Other Debtors - Br 6.5 million. The head of finance for Dire Dawa Textile Factory estimates that at least Br 0.9 million in this category is doubtful.

The factory should consider calling in or writing off some of these long-term outstanding loans. The resulting lack of cash and shortage of liquidity has a negative impact across the factory's operations, reducing production due to the lack of raw materials. Although the balance sheet shows a positive net working capital of Br 24.4 million, it is not an accurate reflection of the current situation.

J. Accounts Payable

The factory has a total of Br 28.7 million payable to creditors. Many of these items should be reclassified as long-term loans instead of current liabilities. For example, Br 1 million has been due to China National Textile since 1990. Also, 18.9 million has been owed to the Ministry of Finance for U.S. cotton since 1994. (Note: In a letter dated July 17, 1995, the Prime Minister's Office informed the Dire Dawa Textile Factory, and other enterprises owing this money, that it was to be paid directly to the appropriate associated enterprises.) Furthermore, Br 2.4 million is owed to the Middle Awash Agriculture Development Enterprise, for the purchase of lint cotton. Obviously, these large outstanding debts have a ripple-like effect within the textile industry, reducing necessary cash flows for other enterprises.

K. Revised Balance Sheet

The above analysis indicates that the value of the Dire Dawa Textile Factory's fixed and current assets is likely overstated. This information is important in determining the net equity or net worth of the enterprise. Based on the above information, estimates were made of the likely changes in asset values needed to reflect a more realistic value for net worth (Exhibit B-4). These estimates are only illustrative, however, because the only way to determine exact values would be through a lengthy and independent evaluation process.

Using these illustrative results in Exhibit B-4, the net worth of the Dire Dawa Textile Factory changes from its present figure of Br 35.3 million to a negative net worth of Br 2.3 million—for a net change of Br 37.6 million.

Exhibit B-4. Dire Dawa Textile Factory: Illustrative Changes to the FY 1995 Balance Sheet (Million Birr)

Item	Current Balance Sheet Values	Revised Values Based on Realities		Change
1. Assets, including depreciation	10.6	@80 percent	8.5	(2.1)
2. Finished goods (inventory)	13.4	@50 percent	6.7	(6.7)
3. General stores (spare parts)	27.2	@33 percent	9.1	(18.1)
4. Inputs (chemicals, dyes)	19.2	@75 percent	14.4	(4.8)
5. Accounts receivable	23.7	@75 percent	17.8	(5.9)
Corresponding net equity	35.3	(2.3)		(37.6)

L. Financial Performance

The major financial indicators for this factory are profitability and net worth. In FY 1995, the loss was Br 8.5 million. It has lost money in two of the last three years and is losing money in the current fiscal year. Moreover, from the above analysis it appears likely that the net worth of the factory is near zero. Taken together, these results guarantee that the overall financial condition of the Dire Dawa Textile Factory is unsound.

Another measure of financial performance is that of net working capital or liquidity. The balance sheet for the factory shows a positive net working capital figure of Br 24.4 million for FY 1995. But current assets (e.g., associated enterprise debts, inventory, spare parts, etc.) may be overstated and are unavailable for cash flow purposes. Therefore, although the books show a positive net working capital, in reality the enterprise is experiencing a serious liquidity problem.

The other more traditional measurements of performance are not applicable in the case of this enterprise, e.g., debt leverage, current ratio, stock turnover rate, net margin, and return on assets. It is necessary to realize a profit or have a net worth before most of these ratios are useful.

M. Other Issues

Two additional issues need to be addressed which impact on the financial operations of this factory: taxes and potential liabilities. For one, the current government charges five different taxes on the operations of this and other factories, i.e, sales, excise, pension, customs, and payroll. Because these taxes pertain to all textile enterprises, the analysis is contained in the main body of this report. This section notes again that heavy taxes make it difficult to compete in the marketplace and even more difficult to accumulate reserves for expansion or modernization.

There are also two potential financial liabilities referred to in the 1993 audit:

- The factory and a former subsidiary were transferred to government ownership on February 2, 1975, and fair compensation was promised by the Ethiopian Government to former shareholders.

- There is a contingent liability of $80,974,801 jointly and severely with 15 other enterprises as successors to the former National Textiles Corporation in respect to legal action.

N. Conclusions and Recommendations

In evaluating the financial performance and condition of the Dire Dawa Textile Factory it would not be prudent to rely only on the accounting data presented in the factory's financial statement. Even though international accounting standards are followed, the statements do not necessarily give a true picture of the enterprise's financial condition. In particular, the balance sheet appears to overstate the value of assets significantly. More effort is needed to include analytical judgement to determine appropriate adjustments to some key values.

Overall the enterprise's financial condition must be considered unsound, with a negative net worth and losses in two of the last three years. To improve the financial condition of the factory, we recommend the following:

- In the future, accounting reports need to be used as a routine management tool and should be used to calculate costs, thereby helping make better decisions on production and pricing.

- The balance sheet should be adjusted for non-functioning equipment, discounted inventory, excess spare parts, and non-likely accounts receivable.

- Much more care is needed in purchasing spare parts, buying those that are genuinely needed, and refraining from buying those that are not needed.

- Liquidity needs to be increased by calling in as many accounts receivables as possible, including the Br 8 million loan to the distributor.

- There is critical need to further reduce fixed expenses.
- The twill fabric in inventory should be sold now, even at a discount, to raise cash.
- The parameters for the distribution of overhead costs need to be reviewed and revised as necessary.

ANNEX C

EVALUATION OF NORTH OMO AGRICULTURE DEVELOPMENT ENTERPRISE

ANNEX C
EVALUATION OF NORTH OMO AGRICULTURE DEVELOPMENT ENTERPRISE

The present North Omo Enterprise consists of four farms (three farm management units) and a ginnery, with the Enterprise headquarters and offices located in Arba Minch. The farm units are the Abaya farm, located 125 km north of Arba Minch; the Arba Minch-Sile farms in the general vicinity of Arba Minch (Arba Minch Farm, adjacent to the town; and the Sile Farm, 23 km south of Arba Minch; these are two separate farms under one management unit); and the Lower Omo Farm (formerly the Ethio-Korean joint venture), located about 380 km south of Arba Minch. There is a total area of 5,505 ha of developed cropland in the enterprise (2,700 ha at Arba Minch-Sile, 1,705 at Abaya, and 1,100 at Lower Omo). Crops grown are cotton, corn, and bananas. The Lower Omo farm has not been operated for the last two years because of lack of operating capital. About 2,600 ha of cropland on the other farms have not been planted the past two years for the same reason. The ginnery is located at the Arba Minch Farm. The organization of the enterprise is shown in Exhibit C-1. There is also a manager for each of the farm units and for the ginnery. The Arba Minch Farm, the Sile Farm, and the ginnery were visited on March 12 and 13, 1996; meetings were also held with the general manager of the North Omo Enterprise on March 7 and with him and several of his staff on March 12 and 13.

A. Physical Resources

The land resources appear to be good. The terrain is reasonably flat and the fields are large enough to accommodate tractors and equipment. About 800 ha are irrigated on the Arba Minch Farm. Irrigation systems on both farms appeared to be well designed, all gravity fed (so that no energy is necessary to lift water), and capable of delivering adequate amounts of water. The irrigation systems are quite old and will probably need substantial new investment within a decade (no engineering assessments were available). The Arba Minch Farm was originally irrigated through concrete pipes; as they have deteriorated, they have been partially replaced with open, unlined ditches. The Sile Farm appeared to distribute water entirely with open ditches. Managers indicated that cotton is irrigated an average of 5 times a year, all after planting, and irrigation scheduling is done with benefit of soil moisture readings. The only shortages of water noted resulted from competition from peasant farmers around the Sile Farm during some years. This competition will almost certainly increase as peasant farmers break out more land.

The irrigation is causing some problems with soil salinity. The salination process results from repeated use of the water, which repeatedly leaches salts from the soils and becomes more saline the further down river it flows. The North Omo operation reports abandonment of about 89 hectares between 1994 and 1996 because of salinity.

The only field operations in progress during the visit were disking at the Arba Minch Farm and burning of cotton stalks at both farms. Stalks are cut at ground level by farm workers (with machetes or something similar) by hand, stacked in the field and burned to dispose of the previous year's stalks. This practice requires large amounts of labor and reduces the biomass added back to the soil. According to management, the only reason for this practice is that the equipment to chop the stalks, so that they can be plowed under to decompose, is worn out and has not been replaced. The tractor operations observed indicated that only 2 or 3 of the 5 or 6 tractors on the Arba Minch Farm were functioning, and their efficiency was low. Insect control was reported to be done with the aid of field scouting, and 6-7 sprayings for insects is typical.

In terms of physical resources of the enterprise, the most seriously limiting is the condition of the machinery and equipment. Virtually all of the farm tractors and implements are worn out and obsolete. The condition of tractors is particularly poor; they were technologically obsolete even when they were purchased 8-10 years ago. Additionally, they are so worn out and have been so poorly maintained that they are virtually scrap. Of 98 tractors on inventory of the North Omo Enterprise, 17 are reportedly operational, but no more than 4-5 are likely operational at any point in time. Most of the implements were similarly used up and most of the other vehicles, primarily trucks, were also poorly maintained. Many non-functioning vehicles were abandoned. The vehicle situation, however, did not appear as serious as the tractors. The maintenance people complain of spare parts and maintenance supplies (*e.g.*, oil filters) not being available. Irrespective of those problems, it was also clear that maintenance work was poor due to low initiative, lack of training, or both.

The gin at Arba Minch was not running during the visit, due to a power outage. The ginnery is operating with 40-year-old equipment, also poorly maintained (with the same reasons cited). The gin has suction feeding, some pre-cleaning equipment, two 88-saw Lummus gin stands and what appeared to be a gin-standard bale press. The manager reported a 4-bale/hour capacity. The bale press would not hold hydraulic pressure, so the bales produced were under-weight. Conclusions about the feasibility of operating and privatizing the ginnery are not possible without benefit of inspection of a ginning engineer. However, this gin might be made functional to meet the needs of the region on an economically sustainable basis with (a) investment of perhaps 1 million birr in refurbishment, including some modernization (this is an impression, not an estimate) and (b) introduction of capable management and technical training of a reduced number of workers. However, successful operation of such a plant is not possible without a reliable power supply. Power outages and power fluctuations are frequent; these cause high operating costs, damage motors, and cause processing problems. Solving the power problem through back-up systems or conversion to diesel power generation are economically infeasible. Thus, successful operation *either* by a state enterprise *or* a private enterprise is not likely unless/until reliable electric power is available. *If* the gin with the present power situation was owned by an entrepreneur, covering the costs of the power problems would probably make ginning expensive enough to discourage cotton production in the area under free enterprise conditions.

The lint cotton from the gin is delivered to textile plants under fixed price contracts and the seed are sold to various oil mills. All sales are f.o.b. to the ginnery grounds.

B. Management

Excess employees are a serious problem. Many people were observed just standing around. The North Omo Enterprise employs 1,661 permanent employees according to their records. That represents about 1.3 ha of cotton per employee in 1995; almost the same as the estimated 1.25 ha farmed by peasant farmers in the region, who have little or no mechanization. The 1,661 permanent employees are comprised of 1,583 in the production sector (913 workers at the Arba Minch Farm, 444 at the Abaya Farm, 178 at the Omo Farm, and 52 at the Ginnery) and 78 in support services (3 in program, 35 in administration, 7 in accounts, 6 in supplies, 1 in agriculture, 8 in technique, and 18 in branch office).[1] Temporary employees are also hired for field operations such as weeding and harvesting.

Conclusions are quite difficult concerning the management of physical resources. Discussions with managers indicated that knowledge of production processes and their management was probably adequate. For example, monitoring of soil moisture conditions for irrigation scheduling sounded efficient, if done as described. The technical production staff seemed to understand agronomic matters, insect control, field operations, and fertilization practices. However, there did not seem to be much understanding of developments in plant genetics, which offer some of the best alternatives for improving yields and reducing per unit production costs.

Even though production managers had adequate technical knowledge, the larger work force did not seem equally able. Workers in substantial numbers stand idle while nearby work receives no attention. Furthermore, managers were not providing instruction and guidance to the workers. Field operations were obviously behind schedule, and many operational aspects did not receive needed attention.

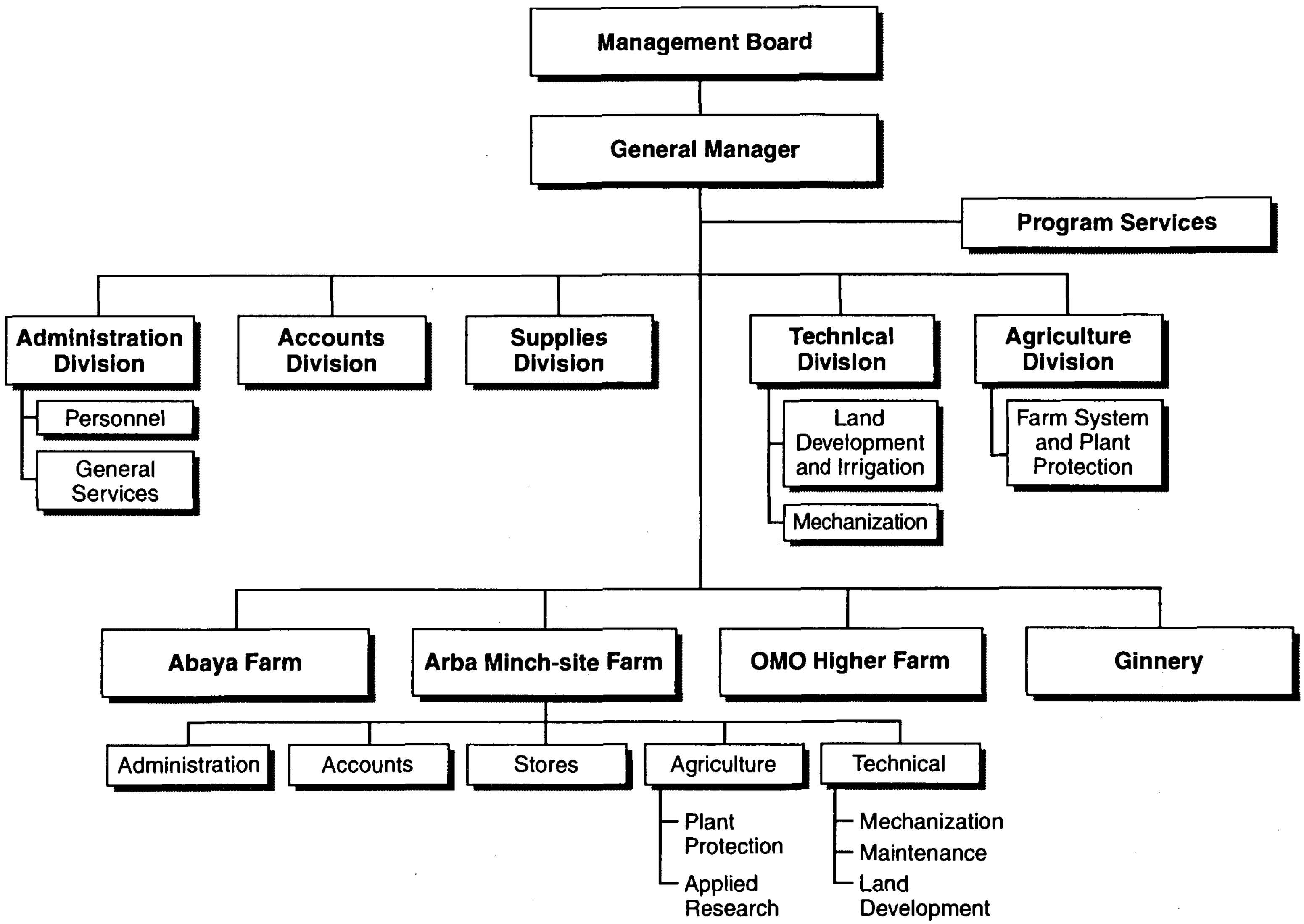
The general manager of the enterprise makes technical operating decisions (e.g., when to spray, when to plant, etc.), but the management board (Exhibit C-1) must rule on all policy and major operating decisions. Management indicated that the most severe limitation they face is obtaining sufficient operating capital. The enterprise must operate on funds generated from the previous year and cannot borrow from commercial banks because they cannot use land as collateral. As noted, machinery and equipment are almost worthless, so it cannot be used as collateral. With constrained operating capital, land producing crops have decreased substantially from levels in the late 1980s.

Another management problem is that skilled workers move to the private farms. Workers with skills in areas such as agronomy, entomology, and skilled mechanics are offered higher wages by private farms, while the state farms are constrained by a wage structure and tacit contract with permanent employees that is grossly inefficient. Consequently, technical skills and expertise are attracted elsewhere. At the same time, employees who are underemployed do nothing and seasonal workers are hired to do the work that the permanent employees could be performing. The wages paid to permanent employees is referred to as "overhead," on the assumption that they must be paid irrespective of whether they produce anything. This is probably the most costly source of inefficiency in the enterprise.

The North Omo Enterprise now carries a book asset value of over 50 million birr. However, the book values of some assets are much too high. For example, the value of land (improvements) is purported to be 13,374 birr per hectare and machinery is valued at 14.8 million birr. Both are clearly infeasible values. The enterprise is essentially bankrupt, and is currently losing an additional 5 million birr per year according to its own profit/loss statements. Management cannot borrow operating capital from commercial banks and has been constrained to operating on cash left over from the previous crop, leaving existing debt unserviced. Interest on the debt continues to be recorded in the accounts, but none of it is paid. There has not been an

[1]These data were provided by the North Omo Enterprise. Data provided by the Textile Sector Task Force shows almost the same number of employees (1,658) but a very different distribution (1,230 production sector employees and 428 support services employees).

Exhibit C-1. Organization Chart
North OMO Agricultural Development Enterprise



official audit of the accounts for the last three years (even though there is an audit fee in the cost accounts), except for a 1995 audit of Lower Omo, which was formerly a separate entity.

With the reorganization of the state-run system and the establishment of a board of directors, some authority was officially delegated to the enterprise management. Nevertheless, the farms are operated the same as under state control. Even though the enterprise is supposed to operate to make a profit, it assumes the objectives of a socialist enterprise, thus making profits difficult, if not impossible. Even if the concepts of efficiency (raising output per unit of input, lowering costs, etc.) are understood by management, they seem to be dismissed as not relevant or not achievable. Furthermore, there are few, if any, positive or negative consequences associated with any actions of labor or management; if management makes poor decisions they lose very little, if they make good decisions they gain very little.

C. Costs and Revenues

Costs and revenues for cotton are shown in Exhibit C-2. Revenues are primarily from sale of lint, with "other" revenues primarily from ginning fees. Costs are broken into categories in the accounts: materials, direct labor, direct machinery, overhead (explained by management as consisting of wages paid to permanent employees who work in production operations; see discussion below), operating expenses (the sum of the aforementioned costs is referred to here as total operating cost), and other costs.

To analyze costs, one must first identify what the cost components consist of. To accomplish this, Exhibit C-3 may be instructive. There are two types of employees: permanent and seasonal. Seasonal employees, all laborers (for weeding, irrigation, crop harvesting, and bagging and tieing at the ginnery), have no assurance of continued employment or pay. Permanent employees, either by tradition or by contract (the mechanism has not been adequately explained), must be paid their designated pay scale irrespective of whether they work. Permanent employees may be classified as labor or management; management consists of the general manager and those department managers who answer directly to him. Permanent labor consists of production labor (at the farm or the ginnery) and management support staff, who take care of the non-production focused work (secretarial duties, clerical work, etc.). The cost of managers and support staff is the "salaries" cost category in the accounts. The cost of permanent production laborers who are not directly involved in crop production or ginning constitutes the "overhead" cost in the accounts. "Indirect labor cost" is comprised of salaries and the portion of the production labor that is not directly applied to production (guards, field supervisors, etc.), while "direct labor" includes all seasonal labor plus the portion of permanent production labor that is directly applied to farming and ginning operations (for weeding, irrigation, harvesting, guarding, bagging and tieing, running the bale press, etc.).

Data from Exhibit C-2 combined with data for the same three years from Exhibit V-1 reveal several important aspects about the cost structure. First, the *total operating cost* is running 3,211 birr per hectare of cotton and 10 birr per kg of lint (about $.72/lb). *Total cost* is 4,102 birr/ha and 12.78 birr/kg (equivalent to $.92/lb). These costs include no returns to land. The implication is that this enterprise falls in the category of "high cost producers" worldwide; it is not competitive in global markets.

The enterprise is losing money at a rate of about 4.4 million birr per year. It is failing to cover even its operating costs by 2.1 million birr per year. Interest on the accumulated debt is a very large cost item, which renders the enterprise bankrupt—it will never be able to pay off its debts. In terms of improving its profitability, the enterprise must increase its revenue, decrease its costs, or both. To increase revenue, the approach with the best prospects is to increase yields, particularly if it can be accomplished with minor increases in cost. Yields at North Omo are quite low for the varieties, growing conditions, and amounts of irrigation water applied. Average yield over the 1992-93 to 1994-95 period was 321 kg lint/ha (about 285 lbs/ac). These yields are one-half to one-third of the yields attained in the United States under similar conditions. Varieties are reported to be old varieties from the United States, with the planting seed being delinted and recycled for perhaps the last 20 years. It is likely that use of newer varieties and the use of certified seed would increase yields significantly, particularly if varieties well adapted to conditions in Ethiopia can be identified. Planting seed should probably not be recycled any longer than five years before being replaced with certified seed. While the fiber quality attributes of the cotton being at North Omo are unknown, it is also likely that revitalizing the germplasm would improve the fiber quality (length, strength, micronaire, etc.), perhaps substantially; this would make each kilogram of fiber more valuable.

Reducing the amount of labor and increasing labor efficiency presents the best chance of cost reductions. Exhibit C-2 shows that wages and salaries—costs paid out to people—constitute 73 percent of the total operating cost. Attempting to reduce costs elsewhere will have relatively little impact on the cost structure, plus there are indications that some other inputs may have been reduced severely enough to reduce profits (e.g., fertilizer, maintenance and repairs). The number of workers needs to be reduced in all departments and functions to at least half the present numbers. The remaining employees need to be induced to be productive when on the job; most who are on the job just stand around.

Exhibit C-2. Official Costs and Revenues[2] from Cotton Production, North Omo Enterprise, 1992-93 to 1994-95 (1,000 birr)[3]				
Item	Year			
	1992-93	1993-94	1994-95	Average
Revenues	4,626.7	7,725.6	6,778.2	6,376.8
Lint sales	4,572.0	7,725.6	6,778.2	6,365.3
Other	54.7			
Costs				
Materials	1,060.0	882.3	591.8	844.7
(Chemicals)	(781.6)	(551.4	(362.1)	(565.0)
(Seed)	(161.6)	(111.7)	(104.4)	(125.9)
(Fertilizer)	(36.6)			(12.2)
(Other)	(80.2)	(219.2)	(125.4)	(141.6)
Direct labor	1,267.8	1,809.2	1,475.5	1,517.5
(Weeding)	(401.0)	(374.8)	(674.9)	(483.6)
(Irrigation)	(141.5)	(254.9)	(354.5)	(250.3)
(Guarding)	(198.9)	(282.4)	(290.1)	(257.1)
(Other)	(526.4)	(897.1)	(156.0)	(526.5)
Direct machinery	932.9	1,204.2	1,125.4	1,087.5
(Plowing)	(325.8)	(507.5)	(587.2)	(473.5)
(Disking)	(170.6)	(270.5)	(239.5)	(226.9)
(Cultivating)	(56.7)	(65.7)	(75.1)	(65.8)
(Other)	(379.9)	(360.5)	(223.6)	(321.3)
Overhead	3,779.4	4,960.1	4,678.8	4,472.8
Operating Expenses	699.2	427.9	555.1	560.7
(Salaries)	(260.1)	(179.7)	(206.5)	(215.4)
(Pensions)	(15.1)	(10.4)	(12.0)	(12.5)
(Repairs and maintenance)	(48.1)	(33.2)	(38.2)	(39.8)

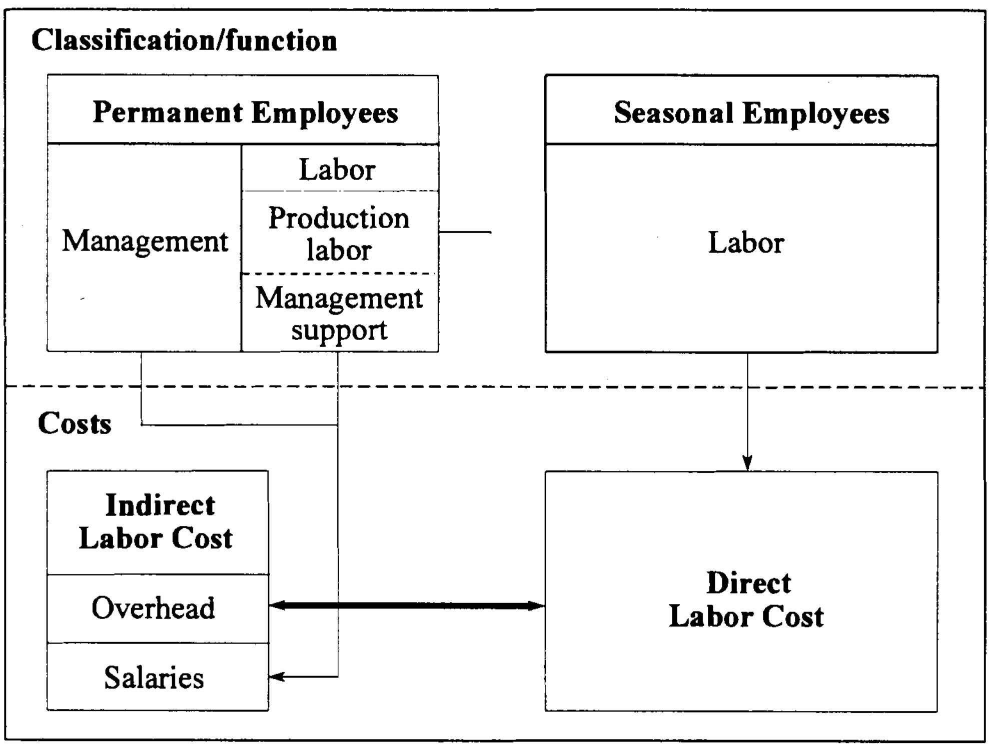
[2]Numbers may not add to exact amounts due to rounding.

[3]Source: North Omo Enterprise records.

2C

Item	Year			
	1992-93	1993-94	1994-95	Average
(Depreciation)	(19.9)	(13.7)	(15.8)	(16.5)
(Insurance)	(41.4)	(28.6)	(32.8)	(34.3)
(Electricity & water)	(0.5)	(0.3)	(0.4)	(0.4)
(Fuel & lubrication)	(63.0)	(44.2)	(50.7)	(52.6)
(Miscellaneous)	(251.2)	(117.8)	(198.7)	(189.2)
Total operating cost	7,738.4	9,283.7	8,426.6	8,482.9
Other costs	-2,365.2	2,209.5	2,485.8	2,353.5
(Audit)	(3.8)	(19.1)	(19.1)	(14.0)
(Interest)	(2,361.3)	(2,190.4)	(2,466.7)	(2,339.5)
Net revenue (before taxes)	-5,456.7	-3,767.5	-4,134.3	-4,452.8

Exhibit C-3. Relationship of Employee Classifications to Cost Accounts, North Omo Enterprise



ANNEX D

EVALUATION OF MIDDLE AWASH AGRICULTURE DEVELOPMENT ENTERPRISE

ANNEX D
EVALUATION OF MIDDLE AWASH AGRICULTURE DEVELOPMENT ENTERPRISE

The Middle Awash Enterprise, located some 250 km east of Addis Ababa near Melka Sede and Melkawerer, consists of three farm units and a ginnery. All cultivated area is in cotton except for about 400 ha of bananas (reduced to about 290 ha because of recent cattle damage). The total land area is about 5,400 ha; it was formerly much larger, but 7,000 ha of the original enterprise have been given to local farmers. The enterprise farm units lie adjacent to one another and generally extend along the Awash River, which provides the water for irrigation; all cropland is irrigated. Total land area in cotton is now 5,125 ha, reduced because of the land given to local farmers and small losses from salinity. Organizational structure of the enterprise is shown in Exhibit D-1. Each of the three farms (Melka Werer Farm, Melda Sedi Farm, and Sedahafagi Farm) has its own administrative, accounts, supplies , technical, and agricultural sections. Additionally, there are two facilities for repair and maintenance of equipment. The organizational structure at Middle Awash is obviously more bureaucratic and cumbersome than at North Omo; that aside, it is also more organized and seems to function better. The farms and the ginnery were visited on March 18 and 19, 1996. Discussions were held with the General Manager and several of the division managers, including the manager of the largest maintenance facility and the manager of the ginnery.

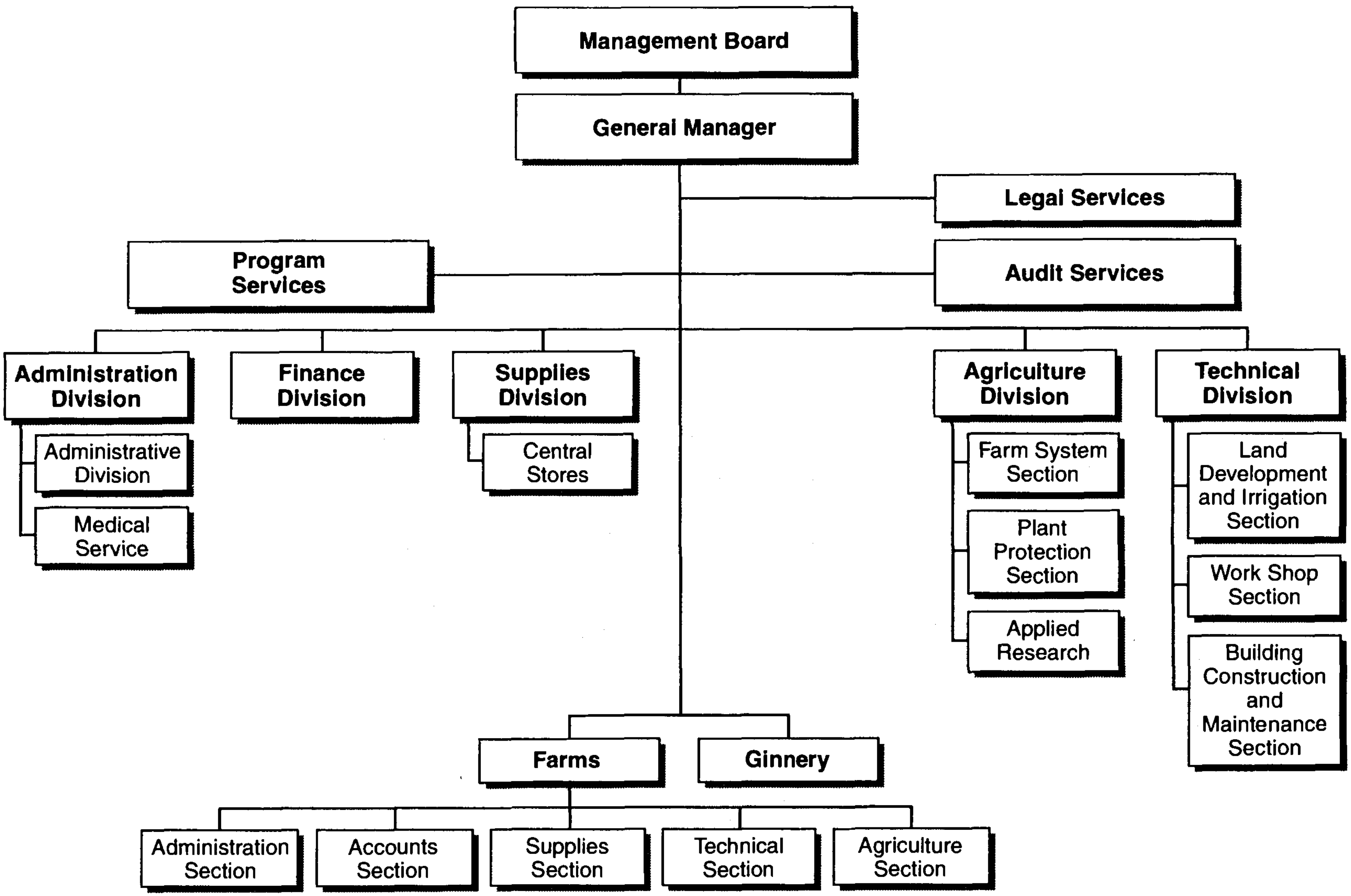
A. Physical Resources

The land resources appear to be quite good. Fields are large and laid out to facilitate the operation of equipment. It resembles a large commercial farm in the United States. Cropped areas are expansive and relatively flat. Irrigation is all through open, unlined canals and cotton is row watered rather than flood irrigated. There is a problem with the irrigation canals silting up, and all of the canals have to periodically be dredged or otherwise re-structured; this appears to be an expensive operation.

A growing problem at the Middle Awash farms is salinity. The salinity problem is inherent in the soils rather than from salinity in the water (this is not an uncommon phenomenon in desert soils). As large amounts of water are applied, salt in the soil is floated toward the surface. Unless it is leached from the soil through a drainage system, or otherwise removed from the surface of the soil, it inhibits plant growth. More than 900 ha of cropland have been lost to salinity and the loss rate is about 50 ha/year. A salt drainage system is being put in for part of the land with funds from the African Development Bank; 58 million birr has been spent on it to date, and it is not yet operational. While the salt drainage system helps the enterprise recover land, it is a foregone conclusion that a system of that type is a poor financial investment for cotton production. It takes very high value crops per unit of land area (tree crops, vines, vegetables, etc.) to pay for such systems.

Irrigation water is sufficient; the irrigation system was developed for 10,000 ha rather than the 5,500 ha now under cultivation on the farms. An unsettled question relates to the cost of maintaining the irrigation system facilities on the land that has reverted to local farmers. How will the system be maintained and who will pay for it? Cotton is irrigated an average of four times during a growing season. The amount of water applied per ha was not known. Managers

Exhibit D-1. Organization Chart
Middle Awash Agricultural Development Enterprise



indicated a need for better land leveling equipment so that the land could be irrigated more easily and achieve better water application efficiency.

There are sporadic incidences of damage to cotton from cattle (the cattle wander into the cotton fields and eat the cotton plants). The greater damage appears to be to the bananas rather than to the cotton.

At the time of the visit to the farms, disking and moldboarding had been done and most of the fields were prepared for planting. Stalks from the previous crop are cut by hand and burned the same as at North Omo, but the reason given was different. It was explained that the operation was done by hand because it was a way to use excess labor (thus, no added cost).

The condition of the equipment and the quality of maintenance and repairs at Middle Awash was a stark contrast to North Omo. Most of the tractors and equipment appeared to be in reasonably good operating condition, and its maintenance appeared to be adequate. Many of the tractors are about 10 years old (about the same as at North Omo), but they were in much better operating condition. Middle Awash has also managed to get a sizeable complement of new tractors donated by other governments and international agencies. The enterprise has more than 40 tractors, with about 20 of them reportedly operating at any point in time, and plans to replace 15 with new tractors this year (from last year's income). The tractors will be Fiat units, with a matching subsidy from the European Community, so that they will cost the enterprise half of their normal purchase price.

Middle Awash has a maintenance and repair facility that appears to be equipped to handle most types of maintenance and repairs except major reconstruction projects and engine overhauls. It is well organized and orderly. They also have an inventory of spare parts, reportedly worth 6 million birr, of commonly needed items (belts, tires, spark plugs, etc.). The inventory is shelved and indexed, and periodically inventoried. They have a metal shop, machine shop, electric shop, and other facilities. A large number of employees work at the facility. The reasons for the relatively good condition of the tractors, trucks, and other equipment is obvious. The managers explained that old machinery and equipment that was no longer of any value to the enterprise is auctioned to the public. This serves two purposes. It provides a small amount of revenue to the enterprise and removes scrap from the premises.

The ginning facilities are about 15 years old. The system consists of suction feeding, some pre-cleaning equipment, two Continental/Moss-Gordon 96-saw gin stands, and a relatively new high-density (probably a universal density) bale press; the press produces bales that are suitable for export. In the ginning process, the two main varieties, SJ2 and DeltaPine 90, are ginned separately. They also have a mote press. There is also an installation to acid de-lint cotton seed for planting. There were thousands of sacks of planting seed stored for use by the farm for the next crop and for sale to the public and the other enterprises. This is an additional source of revenue for the enterprise. The remainder of the seed is sold to oil mills. The ginnery has the same type of power outage problems as does North Omo. Compared to North Omo, the ginnery facility is likewise in much better physical condition, although there are some indications that the cotton may be damaged in the ginning process.

B. Management

The physical resources appear to be well managed. Field work seems to be performed on schedule, equipment is maintained, etc. Labor also appears to be more effectively managed than at North Omo. There is still a large excess of labor on the payroll, but needed work appeared to be getting done in many cases. Data provided by the Task Force indicates that there are 1,199 production sector employees and 150 support services employees, for a total of 1,349. The enterprise reported a total of 1,505 in the permanent labor force (this total is used for subsequent calculations because it appears to be the more current). The labor force age distribution is heavily skewed to the older ages. Temporary/seasonal employees are also hired to assist with weeding, irrigation, and harvesting. They are reportedly paid for the tasks accomplished rather than by the hour. The average daily earnings is 3.5 birr/day. This compares to an average of 4 birr/day paid by private farms, and enterprise management complains of a shortage of seasonal labor. Seasonal laborers are scarce in the local area, so the enterprise provides transportation from other regions to attract them.

Overall, the situation with labor on the farms is confusing. On the one hand, there is an excess (apparently a *large* excess) of permanent labor that for social and political reasons are kept on the payroll. This group of people is poorly utilized. Explanations of their requirements and responsibilities vary; some claim that their contract calls for them to perform only certain functions and that seasonal labor must be hired to do functions simply because the permanent labor force cannot be required to do them. Others explain that the permanent labor does the weeding, irrigation, and harvesting as is needed, but that additional seasonal labor must be hired because there are not enough permanent employees to do these functions. With 3.4 ha of cotton per permanent employee, Middle Awash appears to be considerably more labor efficient than North Omo, but with its level of mechanization, its labor efficiency is still low. If policy makers wish to achieve any reasonable level of cost efficiency in the fiber sector, they will have to develop alternative, more productive, labor contracts to promote higher labor productivity.

Management also indicated an increasing problem with a shortage of skilled manpower, with skilled workers enticed away by the private commercial sector. All indications suggest that the enterprise farms need a higher wage scale and fewer employees.

In managing the production process, they apply no fertilizer. This may be a defensible practice, but it is doubtful. At a minimum, soil tests should be used to determine nutrient needs. It was stated that they apply insecticides 4-5 times per year, as dictated by scouting. As with the North Omo Enterprise, it is also likely that the existing germplasm is depleted and should be replaced. The general manager suspects this to be the case and stated that he plans to import certified DeltaPine 90 this year to try to rectify this problem. There was no mention of testing of other/alternate varieties.

Ginning was in process during the visit (when the power was on). The gin was operating at a rate of 10-12 bales/hour. Cursory examination of the fiber after ginning suggested that there may be some fiber damage occurring (if so, it is likely from adjustments or settings of the gin stands). Fiber testing should confirm if this is the case. Cotton bales were stacked all around the gin yard (approximately 1,400 tons). The gin manager wants to add two or three additional gin stands. However, this is probably a poor investment unless/until the present plant is running at capacity (which is unlikely, given the power supply situation). There were 19 people observed simultaneously operating the suction pipe feeding the gin; this function requires a *maximum* of two.

The cotton is contracted to the textile plants, but they have no money to pay for it and the enterprise is already carrying a 5 million birr debt of the mills. Middle Awash exported 1,000 tons of cotton to Portugal last year, but the Government of Ethiopia has since banned cotton exports. This poses a potentially serious problem for the enterprise, given the financial decisions that were explained. Management arranged an operating loan for the 1995 crop (5.6 million birr at 14.5 percent interest) from a commercial bank, using a lien on the 1995 crop as collateral for the loan. If the textile plants cannot pay for the cotton and the government forbids exports, the enterprise would not be able to pay back the loan and would have to deliver the cotton against the loan. The bank would undoubtedly be unhappy about this and would not likely lend money on the same basis again.

Management seems to view loans and valuations of assets and commodities as mere abstractions. They were clearly unconcerned about paying back loans. Management does not seem to understand the concept of the time value of money and seems to view its responsibilities as limited to performing the production process, leaving financing, marketing, costs, and revenues to take care of themselves. They appear to think that someone will provide the resources needed, and if revenues do not happen to be sufficient, someone will make up the difference. Consequently, this enterprise appears to warrant relatively good marks on physical management, but poor performance on business management.

C. Costs and Revenues

The Middle Awash Enterprise financial records have not been audited for three years, but an external audit was reportedly in progress during the site visit. The previous crop was a good one for the farms, and revenue high. Management complained of the tax load. The local government has a tax of 40 percent of gross profit, then the Ministry of Finance taxes the remainder at an 80 percent rate. According to the general manager, this left the enterprise with 892,100 birr of operating funds left over from a gross profit of 7.4 million birr; the effective tax rate was 88 percent.[1] During years when the enterprise makes a profit, such a high tax rate encourages wasteful expenditures and is a disincentive for future production and profitability.

Accounts and records promised by the management at Middle Awash never arrived, so the data are limited and the validity of the available data is in question; some of the data conflict. Withholding of data and questions about its accuracy add to concerns about the business management acumen at the enterprise. Nevertheless, the best overview of Middle Awash Enterprise costs and revenues that could be pieced together is shown in Exhibit D-2.

The enterprise is losing money at a rate of 4.9 million birr per year. The cost of permanent employees as a percentage of total operating cost could not be calculated because of the absence of details in the data provided; however, the cost of permanent employees less the management salaries is 71 percent of total operating cost. Thus, the cost of labor in the overall cost picture is essentially the same as North Omo. Total operating cost over the last three years has averaged 7,996 birr/ha and 10.66 birr/kg lint (US $.77/lb). Total cost, without a return for land, has averaged 9,657 birr/ha and 12.89 birr/kg lint (US $.93/lb). Thus, unless changes are made to increase revenues, lower cost, or both, the enterprise will remain non-competitive in the international market; the only other outcome is for Ethiopia to continue to subsidize the operation.

[1]This gross profit number is not supported by the accounting records provided by the enterprise.

Exhibit D-2. Official Costs and Revenues[2] from Cotton Production, Middle Awash Enterprise, 1992-93 to 1994-95 (1,000 birr)[3]				
Item	Year			
	1992-93	1993-94	1994-95	Average
Revenues:[4]	27,432.9	6,651.2	46,284.4	26,789.5
Costs:				
Materials	2,748.0	873.9	1,677.1	1,766.3
Direct labor	4,077.9	2,700.6	3,764.5	3,514.3
Direct machinery	1,835.0	2,079.9	1,588.2	1,834.4
Overhead	19,580.9	16,499.6	21,082.3	19,054.3
Operating Expenses	4,163.1	4,980.5	7,436.5	5,526.7
Total operating cost	32,404.9	27,134.5	35,548.6	31,696
Gross profit[5]	-4,972.0	-20,483.3	10,735.8	-4,906.5
Other costs (interest)	6,535.9	6,535.9	6,683.5	6,585.1
Net revenue (before taxes)	-11,507.9	-27,019.2	4,052.3	-11,491.6

Reducing the labor force employed by the enterprise by *at least* half would lower costs without decreasing production. And as with North Omo, it is likely that some improvements in planting seed quality and some use of fertilizer would increase yields and increase income more than costs. Input from production management consultants could increase production efficiency substantially, thus raising net returns. Management consulting input is also needed for training in economic decision making, use of accounting data for management decisions, etc.

[2]Numbers may not add due to rounding.

[3]Source: Middle Awash Enterprise records.

[4]Revenue data came from a separate set of accounting records.

[5]Total income less above costs.

ANNEX E

EVALUATION OF TENDAHO AGRICULTURE DEVELOPMENT ENTERPRISE

274

ANNEX E
EVALUATION OF TENDAHO AGRICULTURE DEVELOPMENT ENTERPRISE

The Tendaho Enterprise site was not visited by the team, which limits the analysis of the facility. When the team prepared to leave Middle Awash for Tendaho, Tendaho could not be contacted by telephone because the lines were out. It was learned that the general manager was on his way to Addis Ababa. A week of efforts to arrange a meeting resulted in a meeting with the general manager in Addis Ababa on March 27. The enterprise contains two farms and one ginnery (Exhibit E-1).

A. Physical Resources

The Tendaho Enterprise currently has 7,765 ha of land, with 6,936 ha in cotton production. Cotton is the only crop grown. The enterprise is located almost 600 km northeast of Addis Ababa. All cotton is irrigated from the Awash River. Irrigation is by gravity flow on about 75 percent of the area irrigated, with some pumping on the rest. It is mostly flood irrigated, but there is some furrow irrigation. (The furrow irrigated cotton has higher yields.) Salinity is a problem. The sources of the salinity are from both the salt content of the river water and the salt in the soil (from the rising groundwater level).

Stalk disposal and land preparation follow the same pattern as at the other enterprises —hand cutting of stalks, burning, then moldboarding or disking. Pre-plant irrigation is used to aid with weed control (sprout the weeds to destroy them before planting). Varieties of cotton grown are Acala 1517, SJ2, DeltaPine 90, and Rager (a short staple, high yielding variety imported from Israel). They plan to grow more DeltaPine 90, which they are getting from Middle Awash. As with the other enterprises, there has been no certified seed planted in many years.

One of the most serious problems faced by the enterprise is damage to the cotton from cattle. The General Manager estimated that they lost 1,400 tons of seedcotton to cattle damage this year (equivalent to 490 tons of lint—2,246 bales). Mitigation of this problem, which costs the area much of its valuable economic output, will probably require the intervention of the regional government. As at the other enterprises, Tendaho uses no fertilizer. The enterprise has 40 tractors, 12 of them new. New Fiat 4-wheel drive (100 hp) tractors cost about 180,000 birr, and 2-wheel drive tractors cost 160,000 birr.

The enterprise has given back about 12,000 ha to the local authorities, 10,000 of it developed land. All that land is now used for grazing—a low economic use for a large investment in development. The region needs to attract commercial farming operations to use the land that is already developed, and protection of crops from cattle would help attract commercial farms. None of the returned land has gone into production of commercial crops.

The enterprise has a ginnery with a reported capacity of 16 bales/hour. The ginnery was built in the 1960s and has 8 Lummus 88 gin stands (only 4 are operational) and a bale press capable of producing exportable bales. Power outages and fluctuations are not as serious as at North Omo and Middle Awash because the ginnery has its own generating capacity—low rpm generators that run on diesel fuel. While no data are available on ginning costs, the generating capacity probably makes ginning costs prohibitive. Tendaho has the best employee facilities of the four enterprises; it has superior housing, a hospital, etc. Production of cotton on the farms has averaged 2,653 metric tons of lint per year, with an average yield of 439 kg lint/ha, for 1992-93 through 1994-95 (see Exhibit E-1).

B. Management

The Tendaho Enterprise has 1,035 permanent employees, 568 production sector employees and 462 in support services. They also have seasonal employees for weeding and harvesting, but seasonal workers are difficult to secure because of the relative isolation of the farms. They do not note a problem with losing skilled workers, apparently because employment alternatives in the region are few due to political instability and the lack of economic enterprises. Management recognized that the employment of workers forced on the enterprise by local politics is a serious problem. The general manager estimated that he needs 40 percent of the workers currently employed at the enterprise.

As with each of the enterprises, cotton is contracted with textile plants on a fixed price schedule. Tendaho's relatively close proximity to a port—300 km—gives it an advantage for exporting cotton. The enterprise exported 2,000 tons last year; it was sold to a private company and exported, so its destination was not known. Of this year's 3,787 tons of lint cotton, 1,300 have been delivered to, and partially paid for, by textile plants. The government has stopped exports.

C. Costs and Revenues

Costs and revenues for the Tendaho Enterprise are shown in Exhibit E-2. The enterprise has been showing a gross profit of about Br 800,000 per year for the past three years, due to a very good year in 1994-95. That is, the enterprise had operating losses of almost 5 and 3 million birr in 1992-93 and 1993-94, respectively, but the high prices and large production in 1994-1995 caused the average for the three years to be positive. Salaries and wages constitute 46.8 percent of total operating cost. Average total operating cost is 4,525 Br/ha and 10.31 Br/kg (US $.74/lb). Average *total* cost in recent years is 5,465 Br/ha and 12.45 Br/kg lint (US $.90/lb).

Two critical aspects for improving the economic/financial situation at Tendaho are reducing the damage from cattle grazing in the cotton and the number of employees. Addressing the cattle damage issue will clearly require a political solution as cattle owners have no motivation to compromise unless the government intervenes. If the government does not intervene, all the residents of the area are penalized by the loss of economic activity (transportation, processing, harvesting, and related employment opportunities). Reducing the payroll at Tendaho requires a fundamental change in both management and political philosophy.

Exhibit E-1. Organization Chart
Tendaho Agricultural Development Enterprise

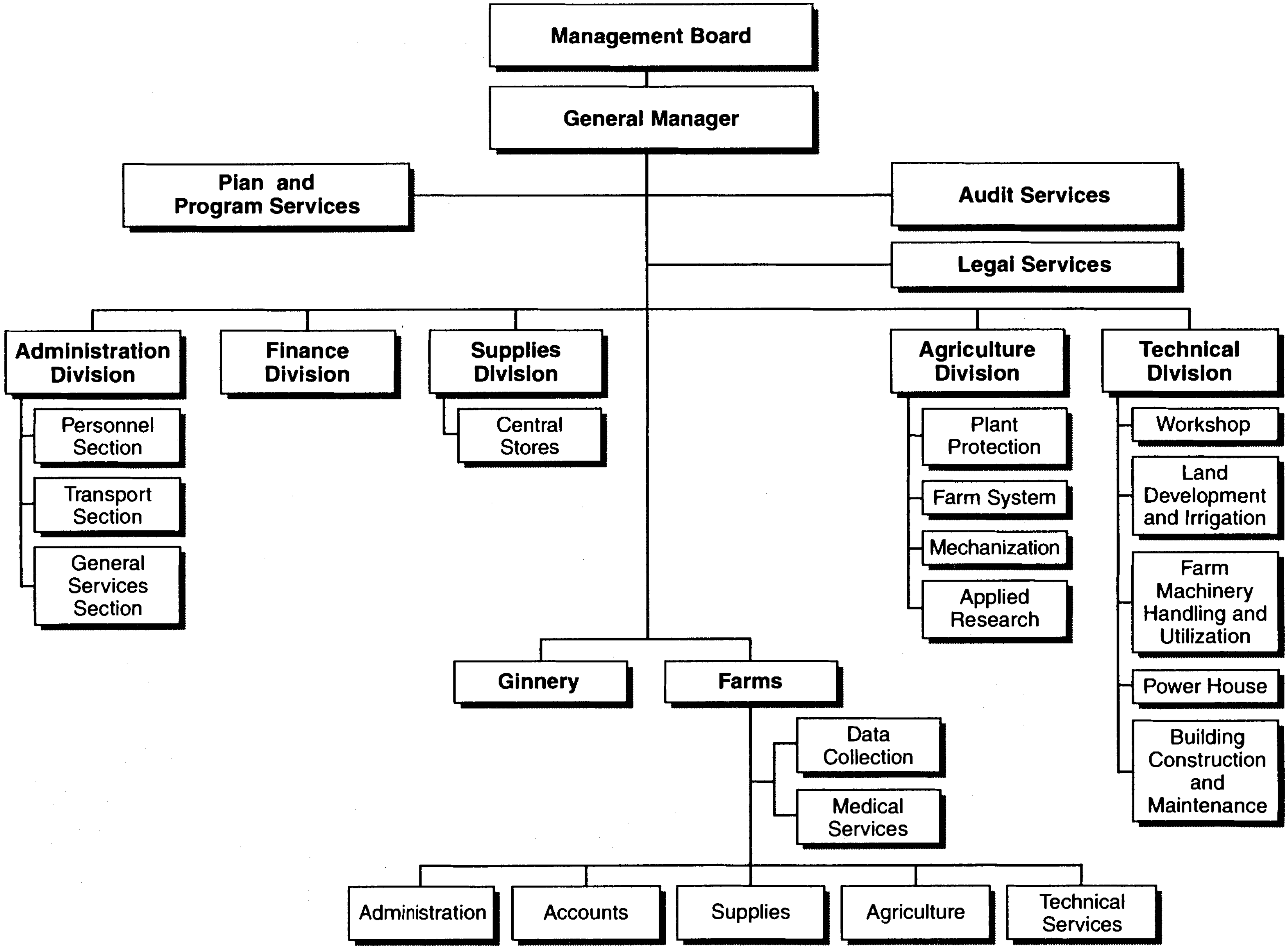


Exhibit E-2. Official Costs and Revenues[1] from Cotton Production, Tendaho (Lower Awash) Enterprise, 1992-93 through 1994-95 (1,000 birr)				
Item	Year			
	1992/93	1993/94	1994/95	Average
Revenues	22,747.0	17,638.9	47,414.1	29,266.7
Lint sales	20,732.2	15,713.6	42,542.0	26,329.3
Other	2,014.8	1,925.3	4,872.1	2,937.4
Costs				
Direct materials	5,014.4	3,070.6	7,346.6	5,143.9
(Chemicals)	(1,891.7)	(1,158.4)	(2,610.4)	(1,886.8)
(Seed)	(158.6)	(97.1)	(234.0)	(163.2)
(Fertilizer)				
(Other)	(2,964.1)	(1,815.1)	(4,502.2)	(3,093.9)
Direct labor	7,023.4	3,889.7	7,401.7	6,104.9
(Weeding)	(878.7)	(486.6)	(926.0)	(763.8)
(Irrigation)	(672.8)	(367.6)	(709.0)	(583.1)
(Guarding)	(685.2)	(379.5)	(722.1)	(595.6)
(Other)	(4,786.7)	(2,656.0)	(5,044.6)	(4,162.4)
Direct machinery	4,357.0	2,630.3	3,901.8	3,629.7
(Plowing)	(1,135.6)	(804.3)	(1,196.1)	(1,045.3)
(Disking)	(437.3)	(265.0)	(391.6)	(364.6)
(Cultivating)	(583.9)	(353.8)	(522.9)	(486.9)
(Other)	(2,200.2)	(1,207.2)	(1,791.2)	(1,732.9)
Overhead and operating expenses	10,231.7	10,302.2	16,893.6	12,475.8
(Salaries)	(3,689.0)	(4,487.2)	(7,139.0)	(5,105.1)
(Pensions)	(137.7)	(167.6)	(266.6)	(190.6)
(Repairs & maintenance)	(683.8)	(888.5)	(1,693.3)	(1,088.5)
(Depreciation)	(2,981.7)	(1,199.3)	(1,011.1)	(1,730.7)
(Insurance)	(175.9)	(228.7)	(435.8)	(280.1)
(Electricity & water)	(118.5)	(154.0)	(293.5)	(188.7)

Item	Year			
	1992/93	1993/94	1994/95	Average
(Fuel & lubrication)	(155.4)	(201.9)	(384.7)	(247.3)
(Miscellaneous)	(2,289.5)	(2,975.0)	(5,669.5)	(3,644.7)
Total operating cost	26,626.3	19,892.8	35,593.2	27,354.3
Gross profit[2]	-4,969.5	-2,872.1	10,259.9	806.1
Other costs	9,037.7	8,220.1	8,731.9	8,663.2
(Audit)	(22.0)	(25.0)	(25.0)	(24.0)
(Interest)	(9,015.7)	(8,195.1)	(8,706.9)	(8,639.2)
Net revenue (before taxes)	-12,917.0	-10,483.8	3,089.0	-6,770.6

Source: Tendaho Enterprise records.

1.Numbers may not add up due to rounding.

2.Total income tess above costs.

ANNEX F

EVALUATION OF ABOBO AGRICULTURE DEVELOPMENT ENTERPRISE

PREVIOUS PAGE BLANK

ANNEX F
EVALUATION OF ABOBO AGRICULTURE DEVELOPMENT ENTERPRISE

The Abobo enterprise is located approximately 800 kilometers west of Addis Ababa near the town of Abobo. The ginnery is located in Gambela, about 40 km away. Abobo is the only state enterprise that grows cotton under non-irrigated conditions. The team did not visit the facilities or meet with anyone from the Abobo Enterprise, so information about it is the least specific. The organization of the enterprise is shown in Exhibit F-1.

The enterprise contains about 4,000 ha of land with 1,366 currently in cotton production. Some corn and sorghum are also grown on the farms. In the last five years, the enterprise had abandoned more than 800 ha of growing cotton fields because of weed infestations and a shortage of labor to control the weeds. The ginnery is rated at 10 bales/hour capacity; the condition of the equipment is unknown. The enterprise reportedly has 10 tractors of East German origin, which are all more than 10 years old and in poor repair. They also report a problem with securing spare parts.

Government Task Force records show 199 permanent employees—173 production sector and 26 support services employees. The extent of employment of seasonal employees is not known, but securing seasonal labor for some field operations is a major problem. The nomads of the lowland areas are not interested in working on the farms. The people in the surrounding highlands areas are farmers with sufficient incomes from their own farms who are likewise not interested in working for the enterprise. The lack of weed control resulting from lack of labor is one of the reasons for the low yields (see Exhibit V-1) and abandonment of planted fields. The enterprise also has difficulty retaining skilled workers because of the relatively low pay scale.

The Abobo Enterprise has the smallest number of permanent employees. It has been losing money at a rate of 438,000 Br/year (Exhibit F-2). It costs the government less money than the North Omo or Middle Awash enterprises. Payments to permanent employees make up about 93 percent of total operating costs. This is probably because rainfed production has no irrigation costs and requires less mechanization of field operations. Annual losses are about Br 2,200 per permanent employee. Combining data from Exhibit V-1 and Exhibit F-2, total operating cost is 2,393 Br/ ha and 10.68 Br/kg lint (US $.77/lb). Total cost is 2,716 Br/ha and 12.13 Br/kg lint (US $.87/lb). This shows Abobo to have the highest unit cost structure of the four enterprises and to be the least competitive in a global market. It has the smallest number of permanent employees and the greatest amount of land area per employee of all enterprises, but also has the lowest yields.

Given Abobo's labor problems, the only practical alternative if it is to continue cotton production may be to substitute other inputs for labor. The enterprise should consider the use of herbicides for weed control and mechanical harvesting. Even if these are feasible economic alternatives, they both pose problems in implementation—they require considerable learning/experience on the part of management and labor. Herbicides can control weeds, but they require precision application, and small errors can negate their effectiveness. Mechanical harvesters must have skilled operators and require diligent maintenance; if the enterprise has difficulty maintaining field tractors, mechanical cotton pickers may be practically impossible. A less complex alternative could be mechanical strippers, but their use would require a complete

Exhibit F-1. Organization Chart
Abobo Agricultural Development Enterprise

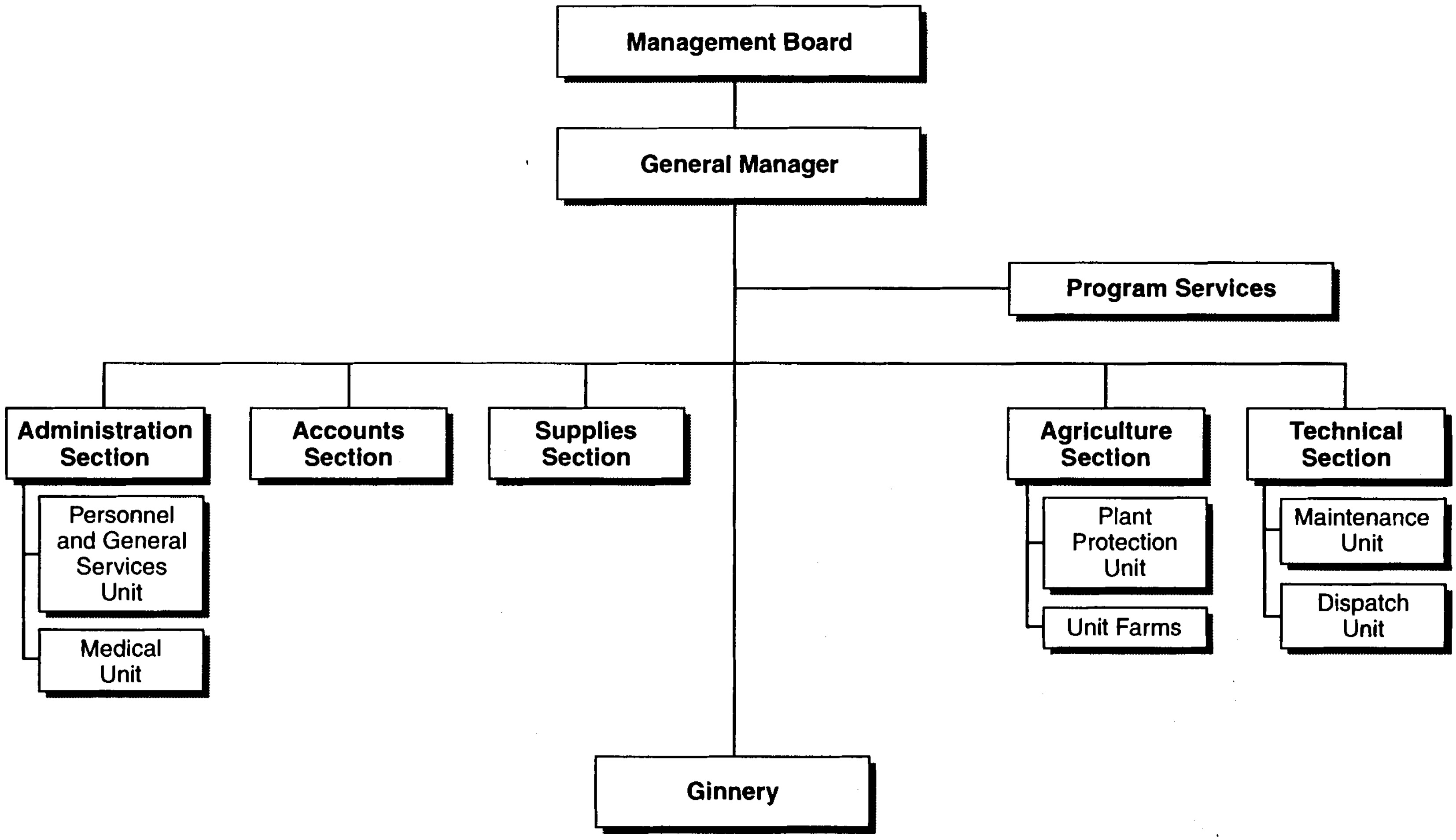


Exhibit F-2. Official Costs and Revenues[1] from Cotton Production, Abobo Enterprise, 1992-93 through 1994-95 (1,000 birr)				
Item	Year			
	1992/93	1993/94	1994/95	Average
Revenues:	2,458	2,359	3,670	2,829
Lint sales	2,314	2,202	3,141	2,552
Other	144	157	529	277
Costs:				
Direct materials	595	313	304	404
(Chemicals)	(465)	(239)	(234)	(313)
(Seed)		(49)	(47)	(32)
(Fertilizer)				
(Other)	(130)	(25)	(23)	(59)
Direct labor	414	299	469	394
(Weeding)	(136)	(115)	(190)	(147)
(Irrigation)				
(Guarding)	(5)	(5)	(8)	(6)
(Other)	(273)	(179)	(271)	(241)
Direct machinery	168	259	375	267
(Plowing)	(63)	(148)	(230)	(147)
(Disking)	(35)	(27)	(42)	(35)
(Cultivating)	(30)	(18)	(28)	(25)
(Other)	(40)	(66)	(75)	(60)
Overhead	2,332	2,006	2,267	2,202
Operating expenses	788	268	914	657
(Salaries)	(274)	(289)	(494)	(352)
(Employee benefits)	(59)	(124)	(104)	(96)
(Repairs, fuel & maintenance)	(142)	(79)	(184)	(135)

[1]Numbers may not add up due to rounding.

Item	Year			
	1992/93	1993/94	1994/95	Average
(Depreciation)	(275)	(215)	(80)	(190)
(Insurance)				
(Electricity & water)				
(Miscellaneous)	(38)	(61)	(52)	(50)
Total operating cost	3,509	2,877	3,415	3,267
Gross profit[2]	-1,051	-518	255	-438
Other costs		637	686	441
(Audit)				
(Interest)		637	686	441
Net revenue	-1,051	-1,155	-431	-879

Source: Abobo Enterprise records.

change in cotton varieties produced *and* installation and maintenance (and investment) of additional pre-cleaning equipment in the ginnery. Each of these approaches would require a major infusion of new capital into the enterprise—in addition to the re-investment in tractors and equipment that reportedly will soon be required. None of these approaches appears to be practical in the near future, but some may offer some possibilities over the long term. The more effective, practical, efficient solution may be to transfer units of the enterprise to private commercial farms as quickly as possible.

[2]Total income less above costs.

ANNEX G

TECHNICAL EVALUATION OF DIRE DAWA TEXTILE FACTORY

255

ANNEX G
TECHNICAL EVALUATION OF DIRE DAWA TEXTILE FACTORY

A. Introduction

The technical team visited the Dire Dawa Textile Factory March 4-7, 1996, to perform a comprehensive technical assessment of the plant. This is one of the oldest factories in Ethiopia, with much of the machinery 30 to 40 years old. Over the years, it grew into an integrated textile manufacturing enterprise. The factory currently engages in cotton spinning, weaving, and dyeing and finishing of fabrics and yarns. Also, it has facilities for spinning and yarn dyeing of acrylic fiber.

B. Spinning Operations

Although the Dire Dawa Textile Factory has a small spinning system for acrylic fiber, the comments in this section will be limited to the cotton system. (The acrylic system will be covered at the end of this Annex.) The cotton spinning operations are contained in Mills Number One, Three, and Five. A summary of major machinery and equipment associated with the cotton operations is given in Exhibit G-1.

The spinning frames comprise some of the newer equipment in the plant; they range from 15 to 46 years of age. Dire Dawa has the largest number of spindles (67,058) of any textile factory in Ethiopia and has machinery for lap forming and combing.

B1. Opening Line

During our inspection of the opening lines, we were told that the quality of cotton fibers available to the textile factory is of great concern. In particular, they strongly suspect that the staple length is too short and the short fiber content is too high.

The opening lines are fed by hand. The fiber opening is primarily performed by Kershner beaters, and we were struck by the lack of maintenance that was evident on the lags of these beaters. The ruined condition of the lags clearly caused fiber breakage. When this was discussed, we learned that new lags were available in spare parts storage, yet there was no inclination to install them.

There is also striking evidence of excessive wear of gears and gear journals associated with the picker operation. Some wear was due to improper adjustments, but more was probably due to the use of incorrect lubricants, which collected and retained metal dust. The result is an abrasive action that deteriorates the gears and journals. Our discussions led to the conclusion that erroneous recommendations had been made in previous years and the error had simply been perpetuated. The error was almost certainly due to the failure to compensate for the effect of altitude and climate on the viscosity of the lubricants, and their ability to adhere to metal parts.

Exhibit G-1. Number of Machines and/or Units Associated with the Cotton Spinning Operations at the Dire Dawa Textile Factory

Process	Plant #1	Plant #3	Plant #5	Total
Opening Lines	2	2	3	7
Carding	24	13	94[1]	131[1]
Drawing	8	4	21	33
Lap Forming	1	0	1	2
Combing	8	0	6	14
Rovin	6	5	14	25
Spinning				
Frames	38	35[2]	75[3]	145[4]
Spindles	17,328	14,120[5]	30,200[6]	61,648[7]
Winding	3	4	8	15
Reeling	20	23	0	43
Twisting	0	0	24	24

[1] 10 of the carding machines appear incapable of production.
[2] 16 of the spinning machines were not being used.
[3] 18 of the spinning machines were not being used.
[4] 34 of the spinning machines were not being used.
[5] 6,400 of the spindles were not being used.
[6] 7,344 of the spindles were not being used.
[7] 13,744 of the spindles were not being used.

B2. Carding

In one mill is an installation of Platt carding machines. Many of the gear reduction-clutch drive boxes for the doffers on these machines are not functioning properly, due to the failure to maintain adequate oil levels. The levels should be checked at least once a month. We noted that there is an inspection port provided on this component that enables easy checking. Unfortunately, enough damage had already occurred that some of these units will have to be completely rebuilt.

Wire on the carding machines appeared to be sharp enough. However, there did appear to be problems with keeping the wires clean, particularly for the flats. This reduces the quality of the card sliver both because of lost physical efficiency and increased contamination. Although it was indicated that good burnisher rolls were in storage, they were not being used to keep the wires clean.

The basic card settings are summarized in Exhibit G-2. Given current production rates by these cards, it is likely that some of the basic card settings are sub-optimal. Thus, the setting of the feed plate to licker-in and of the under-card screen to cylinder could be contributing to the creation of short fibers. These settings may simply be those prescribed when the equipment was first erected; as production rates and other factors changed, they should have been modified.

Chokes on the screens also caused breaks in the selvages of the card web. Discussions revealed that operators were aware of this, yet they had no plan to investigate and solve the problem.

Exhibit G-2.Basic Card Settings at the Dire Dawa Textile Factory

Location	Setting
Feed Plate to Licker-in	.010 - .012 in
Mote Bars to Licker-in	.012 - .014 in
Licker-in to Cylinder	.010 in
Back Plate to Cylinder Top Bottom	 .022 in .022 in
Flats to Cylinder 1st Stand 2nd Stand 3rd Stand 4th Stand 5th Stand	 .010 in .010 in .010 in .010 in .010 in
Screen to Cylinder Front Center Back	 1/32 in 1/32 in 1/8 in
Front Plate to Cylinder Top Bottom	 .022 in .022 in
Cylinder to Doffer	.005 in

B3. Drawing

About the best that can be said for the drawing machines in any of the three cotton spinning units is that they are operational. Their mechanical condition is below the level that would allow them to produce a good quality sliver. Specific observations include:

- The pneumatic cleaning systems have been rendered totally ineffective. Photographs made of the machinery reveal the filthy condition of these machines.

- Gears have worn out and in several instances were fabricated at the factory's machine shop from diverse materials. One was being made from brass at the time of our visit, even though this was the wrong material for the application. In another application, a nylon gear had been used to replace a metal gear; when the material was cut, however, no allowance was made for the tendency of nylon to have a slightly larger diameter than the gear blank from which it is cut. As a result, the gear is slightly oversized. Since it is used in a fixed position between two other gears, its size causes excess wear on itself and the other two gears.

B4. Lap Forming and Combing

All equipment in the combing area is covered and out of use at this time. It was explained that the equipment was actually purchased some years ago for another textile factory but was diverted to Dire Dawa.

Inspection of the lap forming equipment revealed that it is as good as any that can be purchased today. With minor refurbishing and an adequate maintenance program, it could be used quite productively.

The combing machines are in fair condition. Since their performance is dependent on a clean, moisture-free supply of compressed air, some attention to the air supply system would serve to avoid problems with the air solenoids in the machine. Other observations include:

- The drafting area should be cleaned on a routine basis, even when the machine is not in use.
- Brushes of the comber half-laps show signs of not being adjusted properly over time, as evidenced by a build-up of fibers in the needles of the half-laps. This results in poor combing and wears out the half-laps prematurely.
- Noils removed by the comber had wrapped around the press rolls to an unacceptable extent causing intermittent feeding of noil particles into the finished sliver. This should have been prevented by properly positioning noil receiver cans.
- Reserve supply creels are not on these machines; they should be installed for efficient use.

B5. Rovin

The rovin frames have the latest type of drafting systems available: a four-roll, double-apron system. Accumulated experience with this system indicates that, although the evenness percentages as measured on the Uster tester are little, if any, better than those from a three-roll, double-apron system, the yarn and fabric appearance is often better.

There appeared to be a lack of routine operator cleaning of the drafting system and several grommets were missing from the tops of the flyers. Correcting these shortcomings would reduce end breaks and improve quality of the rovin sliver, which in turn would enable improved spinning performance and yarn quality.

Observations and discussions with plant personnel raised the suspicion that the twist used for the rovins may not be optimum for the yarn sizes and fabric types produced at this factory. Investigating this issue and making needed adjustments could significantly improve yarn quality.

B6. Ring Spinning

Data on the manufacturer, year made, and number of frames are summarized in Exhibit G-3. The drafting system installed on the spinning frames in all three cotton spinning installations is the latest available for industry today. Additional new spinning equipment is not needed to achieve adequate spinning performance. Rather, attention should be focused on conditions and practices covered below:

- Using an electronic hygrometer, several measurements of temperature and relative humidity were taken. They were stopped during the afternoon when the temperature in the spinning department exceeded 40 degrees Celsius and the relative humidity fell below 30 percent. The design of the air wash/air conditioning system is grossly inadequate; no type of chilled water is used in the air washer portion of this system. Moreover, given the current lay-out of the factory and the air washer, adding refrigeration equipment would be practically useless. This lack of adequate ambient condition controls in a climate like that of Dire Dawa will prevent consistent spinning performance.

- Cleaning of the drafting system is an operation that needs considerably more attention than it is currently given. If we understood correctly, the top rolls are cleaned on a monthly schedule. Cleaning should take place at least every three running days to facilitate efficient operation of the spinning frame and avoid unnecessary defects in the woven fabrics.

- The yearly schedule for maintenance of the spinning frames involves scouring the drafting systems, installing newly buffed top rolls, and replacing worn and damaged aprons. For this type of drafting, it would be prudent to perform this maintenance every six months, and not allow it to lapse more than nine months.

- The spindle speeds used for the courser counts of yarn are not optimum. Based on the ring-to-gauge relationship, a lower speed should significantly reduce the frequency of ends down, resulting in higher quality and increased output.

- Based on measurements of vacuum levels in the pneumatic end collector system, the air ducts need to be thoroughly cleaned. The result should be reduced ends down.

Travelers are changed on a monthly cycle, but this is insufficient and contributes to the ongoing problem with burned travelers. Another likely contributor to the problem is the use of an inappropriate style and weight for the travelers. The travelers are probably too light because the spinning pirns produced are too soft. In any case, the problem is certainly exacerbated by a practice of using a liquid petroleum jelly to lubricate the rings. This results in the collection of metallic dust in the lubricant from the normal wear of travelers and rings; the mixture results in an abradant that will grind down the ring.

Exhibit G-3.Basic Information on Spinning Machines at the Dire Dawa Textile Factory

Location	Manufacturer	Year Made	Number
Plant #1	Toyoda	1981	38
Plant #3	Platt	1950[1]	20
	Toyoda	1969	1
	Toyoda	1971	14
Plant #5	Toyoda	1965	30
	Toyoda	1967	5
	Toyoda	1968	15
	Toyoda	1969	5
	Toyoda	1970	17
	Toyoda	Unknown	3

[1]All of these machines were rebuilt in 1975.

B7. Winding

Although the winding activity is the culmination of ring spinning operations, all of the pirn, cone, and cheese winding machines are located with the weaving operations at Dire Dawa in Mills Number Two and Five. These two mills are discussed below.

B7a. Mill Number Two

This mill has Schlafhorst cone winding machines that are in need of a major overhaul. In total, 460 winding heads were available of which only 230 were programmed to operate. Of these 230 heads, 30 were observed to be inoperable. Other observations include the following:

- The majority of stop motions did not work.
- The cones did not rise from the drum, resulting in abraded yarn.
- The slub catcher plates were rough and nicked, which caused further abrasion to the yarn. Yet the plates were set so wide apart that they could not catch the average slub.
- Several mandrel pivots were worn and rusty, indicating poor lubrication and maintenance.
- Drums had sharp, grooved edges, which caused further damage to the yarns.

B7b. Mill Number Five

All of the pirn winding capacity and most of the cone winding capacity is located in Mill Number Five. There are three contingents of pirn winding machines. One group consists of nine Scharer machines that appear sound. However, to provide the service for which they are capable, they must be configured correctly, adjusted accordingly, and permitted to operate as automatic machines. Specific observations include:

- No use was made of the automatic doffing facility; pirns were transferred by hand to other containers.

- Numerous settings were incorrect for the type of pirns used.

- Some winding heads were fitted with short winding spindles not suitable for the pirns used. There were mixed spindles on the same head.

- The automatic feed system was not set correctly and operators were feeding pirns by hand, resulting in poorly wound pirns.

- There were insufficient quantities of pirns to service winding machines; old and new pirns were mixed; broken and worn pirns were still being used.

- The automatic pirn change mechanism was not working effectively because of the incompatibility of some pirns and spindles.

There is also a group of eight Koa pirn winding machines that are in such poor condition that they should be scrapped. Five machines are still in operation, while three are sheeted up. None of the automatic systems are usable.

The last group of pirn winders are Murata machines, which are copies of the Hacoba/Britoba winding machines. The machines were sheeted up and not used; however, they appear to be basically sound. It is feasible to overhaul them and put them back into use, if needed.

Mill Number Five has 11 double-sided Murata cone winding machines. However, only five of them are used. The following items require attention:

- Different tension weights were used on adjacent spindles, resulting in different package densities and tensions.

- The automatic stop-motion devices were not threaded and appeared to be nonfunctional.

- The package diameter device was missing or was set differently on adjacent spindles; it was ignored by the operator.

- Slub catchers were set so wide apart that they were ineffective.

There were also eight Murata cheese winders in this mill, but the equivalent of only one-half of a machine was used. The tension weights of the few spindles used varied from spindle to spindle.

C. Weaving Operations

Weaving and immediately associated processes at Dire Dawa are located primarily in Mills Number Two and Five. Each mill contains some of the winding machines. Mill Number Five is vertically integrated from bale to fabric.

The condition of the building for Mill Number Two can only be described as dilapidated. The only ceiling is a corrugated tin roof, which is thoroughly rusted and peppered with holes, providing little protection from rain. There is no air conditioning or humidity control, and the lighting is poor.

The building for Mill Number Five is not as dilapidated as the one for Mill Number Two. However, the environmental controls in the weaving operations are actually destructive. There are water sprays fitted to increase the level of humidity; these are not atomising correctly, resulting in significant quantities of large water droplets. Even though much of the machinery and floor was wet at the time of inspection, the humidity level was only 59 percent. This situation is persistent, as evidenced by the rusty machinery.

C1. Warping

C1a. Mill Number Two

There are two Schlafhorst warping machines, although only one was running during the visit. The beams produced were of very poor quality. Measurements taken on individual yarn tensions revealed extraordinarily high variations, ranging from 2 to 17 grams per thread. The variation should be no more than two grams per thread. Inspection revealed the following causes for the extreme variation:

- Tension disc weights were not all the same.
- Some tension devices were completely broken off the machine.
- Some tension devices were incorrectly threaded.
- Package sizes varied.
- Cone pegs were out of alignment.
- Some cones were too large for use on this creel (causing further misalignment of creel pegs and interference between cones).
- It was also apparent that the expanding reed dents on the front of the warping machine were badly nicked, causing severe abrasion of the yarns.

C1b. Mill Number Five

The two warping machines, manufactured by Baba of Japan, were generally capable of winding the beams required in Mill Number Five. For machine number one, the badly nicked comb needed to be replaced. For both machines, the stop motion mechanisms need overhauling.

For machine number one, 5 of 20 lights did not work at all and 4 additional lights worked intermittently. For machine number two, 7 out of 20 lights did not work.

It was observed that the same tension weights were incorrectly being used for both 14 Ne yarn and 30 Ne yarn. Also, the warping machines were actually stopped the majority of the time due to end breakage; this suggests major problems with the yarns and/or the yarn packages.

C2. Slashing/Sizing

C2a. Mill Number Two

There are two slashing/sizing machines. The moisture meters on both were disconnected; therefore, it was impossible to tell whether the sizing was being dried properly. Also, the smit markers were not operative on either machine, making it impossible to know the precise length of yarn put on the beams.

On machine number one it was noted that:

- The flanges on the warpers beams were bent and severely nicked. This results in abraded yarn and very poor sides to the sized beam.
- The first size squeeze roller was very hard and needed to be changed. A covering was placed on the second roller to compensate for the hard rollers, resulting in uneven size application to the yarns.
- The expanding reed was loose and was badly bent and nicked. The result is abraded yarn that is irregularly wound onto the beams.

On machine number two it was noted that:

- The warper beams were out of alignment. Of four beams recently taken off the machine, three of them were of correct density but one was very soft.
- One of the cylinder bearings was grinding and making a loud screeching sound.
- The expanding reed was very uneven, contributing to erratic beam surfaces and densities.

C2b. Mill Number Five

- There are four slashing/sizing machines, although only two were running while the technical team was at Dire Dawa. All four machines were manufactured by Baba of Japan.
- Machines number one and four were running adequately, except that neither had operating smit markers nor moisture meters. Machines number two and three were not operating but appeared to be in a similar condition as the others. The squeeze rollers were observed to be somewhat lightweight, implying that these machines should be restricted to finer or less dense warp sheets.

- This mill contained a cooking area, located away from the aforementioned slashing/sizing machines. It contained two sets of size mixing and cooking equipment. For one of the pressure cookers, it was observed that the mixer rotation was very slow. This indicates a motor, gearbox, or bearing seizure problem; regardless, it demands urgent investigation and repair. Also, neither the timer nor the pressure gauges work correctly on this cooker. Extremely dangerous wiring was exposed at the rear of another one.

- Two large horizontal storage racks were available to hold the beams until they were taken to the sizing machines. They contained 32 full beams and 28 empty beams. Also, there were 14 racks at the front and side of the sizing machines to accommodate sized beams. The capacity of these 14 racks is approximately 400 beams; however, only 3 racks were in use containing a total of 10 full beams and 23 dead beams, with the racks containing only empty beams.

- In the preparation area, it was observed that the wire needles were of very poor quality, with unsoldered eyes that abraded the yarn. All the samples were very rusty and should have been destroyed long ago. Also, all the reeds were damaged and should have already been destroyed. Finally, all the drop wires were rusty or contaminated.

- Four Knottex tying machines had been cannibalized and were useless, yet they had not been removed.

C3. Weaving

C3a. Mill Number Two

There are 398 Kovo automatic looms and 12 Ruti C looms. The following observations were made regarding the Kovo looms:

- Cloth production is restricted to a maximum greige cloth width of approximately 90 centimeters, which is too narrow for most markets.

- All the automatic pirn changing devices (or batteries) had been removed from every loom, effectively reducing the machines to no more than motorized hand looms.

- Eighty of the machines had been cannibalized, dismantled, or left in such a condition that they were incapable of operating again; they are therefore scrap. They are still sitting in place, however, hindering the operation of the remaining 318 Kovo machines.

- Twelve of the machines were gaited, yet they had obviously been sitting for a long time. These machines are also likely to be scrap.

- Of the remaining 306 machines, all were in deplorable condition and incapable of making a fault-free product. Only one loom had recently been cleaned.

- The speed of the looms varied from 92 ppm to 140 ppm, the average of the sample recorded being 124 ppm. This compares badly with the 145 ppm used in the statistics provided by the factory.

- Without exception, all reeds appeared to be damaged enough to make marks on the cloth.

- Only two bar warp stop motions were employed; even these were very rusty. Most did not work.

- Many components were rusty and incapable of operating.

- On most looms, the temples were marking the cloth.

- Weft feelers were either nonexistent or inoperable.

- In a random sampling of the machines, every crank bearing was badly worn.

- Many shuttles were worn so severely that bolts were protruding from the back face, resulting in damage to the reed.

- Many electric motors had noisy, worn out bearings, yet they were not stopped to be repaired.

In summary, it appeared that none of the Kovo looms could be economically overhauled even if spares were available.

Besides the Kovo looms, 12 Ruti C looms were placed at the rear of the weaving shed. These are the most modern in the whole of the Dire Dawa plant; they represent the only automatic weft change machines capable of operating as originally intended (i.e., 12 machines out of a total of 1,067 original automatic machines). Unfortunately, the roof leaked over these machines, and one of them had already become inoperable due to electrical failure. Furthermore, many devices needed either adjustment or replacement.

It is economically feasible to overhaul the 12 Ruti C looms. Contrary to expectations of people in the factory, spare parts are readily available from several international sources at reasonable prices.

C3b. Mill Number Five

The looms in this mill consisted of 648 Toyoda shuttle change machines and 12 Ruti C machines (not to be confused with the Ruti C machines in Mill Number Two). Observations on the Toyoda looms include:

- They have a maximum reed width of 130 centimeters; however, virtually all the fabrics produced on them were in the vicinity of 90 centimeters.

- All the automatic pirn changing (i.e., battery) devices had been removed, reducing the machines to non-automatic status.

- All machines were fitted with plain weave mechanisms except for 30 machines fitted with Amada dobbies (type N). Of these, 13 are either not working or not workable.

- Fifty-one of the non-dobby machines (eight percent) had been cannibalized, dismantled, or damaged to such an extent that they could only be considered as scrap.

- Ninety-five additional non-dobby machines (15 percent) cannot run without major overhauls.

- Many of the loom side frames are cracked. (Note: A recent survey within the mill counted 129 of these.)

- All machines were rusty, apparently due to malfunctioning water atomizers that are dispensing large water droplets. Although all machines are fitted with four row stop motions, they are so rusty as to be inoperative.

In summary, none of these Toyoda looms could be economically overhauled and restored to automatic machine status.

Of the 12 Ruti C looms in Mill Number Five, it was observed that none of the automatic pirn changing devices were operating. Four of the looms were completely inoperative and had been unused a long time. The rest were in poor mechanical condition and needed an overhaul.

C4. Greige Fabric Inspection and Folding

Fabric inspection and folding is located in Mill Number Two and Mill Number Five. In Mill Number Two, five inspections machines (including one wider machine) are in operation. The cloth is then folded on two plaiting machines. Unfortunately, the plaiting machines were folding the cloth so badly and being operated in such a casual manner that the result was less than satisfactory. Nevertheless, with proper settings and careful operation, these machines would be quite capable of giving many more years of service.

In Mill Number Five, several inspection machines were in use and capable of providing the service required. Two additional machines were sheeted up. The cloth is folded on a plaiting machine, but the cloth guides provided were not used. The cloth from Mill Number Five is then transferred to Mill Number Two.

The majority of the cloth is cut into 30 yard lengths and the small pieces strung with a large bodkin, making holes two inches from the edge of the cloth. Approximately 40 of these strung pieces (dependent on product) would then be pressed and baled before being covered in jute wrapping for dispatch to the store. These practices damaged the cloth appreciably.

D. Dyeing and Finishing Operations

The Dire Dawa Textile Factory has three distinct finishing sections. They are:

- Fabric dyeing and printing

- Cotton yarn bleaching and dyeing

- Acrylic yarn dyeing

These will be discussed below, after considering water supply and treatment and the boilers.

D1. Water Supply and Treatment

The water supply for all wet processing comes from underground wells and is pumped into a holding tank. It is then pumped into clarifiers for treatment with lime, soda ash, and alum. The clarified water is softened using a cationic zeolite treatment.

The condition of the water treatment plant is poor and testing equipment is inadequate. The only meaningful tests are for the degree of hardness and pH factor. The water supply is sufficient for present needs, but if its use for fabric dyeing and printing were to reach high levels, a larger reserve supply tank would be necessary.

None of the effluent from the wet processing is treated. Waste water from all three sections is simply drained into the desert.

D2. Boilers

There are a total of five oil-fired boilers, which are in poor condition. Number three boiler (manufactured by Hirakawa in 1966) is defunct; its main boiler tube collapsed in 1993. The other four boilers are operable, although one was off-line for repairs. All were in need of a major overhaul. Built between 1964 and 1974, all have probably exceeded their working life. The badly corroded and excessively vibrating pipes and inoperable gages and safety devices could result in a major failure at any time. The pipes going from the boiler house to the textile buildings were of poor quality and had inadequate steam traps. Yellow burning flames and excessive soot were symptoms of poor combustion, and the indicated oil consumption of 20 tons per day is excessive for a plant of this size.

Steam from these boilers serves the sizing, dyeing, and finishing operations. Water that goes into the boilers receives an additional softening treatment and is tested for softness. This aspect of the boiler operation appears to be adequate.

D3. Fabric Dyeing and Printing

This part of the wet processing has machinery and equipment for singeing and enzyme treatment, scouring and bleaching, mercerizing, dyeing, and printing. All the equipment is narrow gauged and therefore obsolete. It handles only the 90 centimeter fabric that comes out of the weaving operations. Typical processing steps for dyed fabrics are shown in Exhibits G-4 through G-6. Typical processing steps for printed sheeting fabric are shown in Exhibit G-7.

Exhibit G-4. Process Flow For Dyed Poplin and Asnakech Fabric at the Dire Dawa Textile Factory

SINGE AND DESIZE
↓
SCOUR AND BLEACH
↓
CYLINDER DRY
↓
MERCERIZE
↓
WASH
↓
STENTER DRY
↓
DYE
↓
WASH
↓
STENTOR DRY
↓
FOLD OR ROLL
↓
BALE

Exhibit G-5. Process Flow For Dyed Bed Sheeting Fabric at the Dire Dawa Textile Factory

SCOUR AND BLEACH
↓
STENTER DRY
↓
PAD DYE
↓
PAD FINISH and STENTOR DRY
↓
FOLD
↓
BALE

Exhibit G-6. Process Flow For Dyed Gauze Fabric at the Dire Dawa Textile Factory

PAD-BATCH BLEACH
↓
WASH
↓
STENTER DRY
↓
PAD FINISH and STENTOR DRY
↓
FOLD
↓
BALE

Exhibit G-7. Process Flow For Printed Sheeting Fabric at the Dire Dawa Textile Factory

SCOUR AND BLEACH
↓
STENTER DRY
↓
PIGMENT PRINT
↓
BAKE
↓
PAD FINISH and STENTOR DRY
↓
CALENDAR
↓
FOLD

D3a. Singeing and Enzyme Treatment

This is a continuous operation that removes the loose fibers from the surface of the fabric. Fabric is first passed through the singeing box with a flame applied to both surfaces. Then the fabric goes into a wash box containing a wetting agent and an enzyme to solubilize the starch used as a size in weaving. After saturation, the fabric passes through squeeze rollers, is folded onto trucks, and stands for four hours. During the stand time, the enzyme acts upon the starch.

The singeing section has no fabric spreaders; therefore, the fabric enters with creases and the flames are unable to affect the fabric surface. The air-to-fuel ratio is not set properly and there is no straightforward control for flame height.

The squeeze rolls following the enzyme saturation section are in poor condition and need to be replaced. Also, while the fabric is stored on the trucks, it is not covered, which lets it dry along the edges, resulting in defects in the dyeing.

D3b. Scouring and Bleaching

Scouring and bleaching is done in open jigs, where the fabrics are scoured with a detergent and caustic, rinsed, and then bleached using hydrogen peroxide and an organic stabilizer. In the case of a gauze type of fabric, a cold pad-batch combination scour and bleach is done, then after a 24-hour dwell time, the fabric is washed in the jig.

While the factory does have five pressure jigs, they are not used because of their poor condition. The open jigs currently used are only in fair condition.

D3c. Cylinder Dryer

There is one cylinder dryer. On the input side, pad mangle squeeze rolls remove excess moisture before drying, but the squeeze rolls are in poor condition and the drying section is in only fair condition.

D3d. Mercerizing

The plant has a cold mercerizing system with two stabilizing tanks and six wash boxes. The condition of the system is poor, with the spreaders and squeeze rolls in particularly poor condition. The range uses clips on the chain for width control in the mercerizing section.

Dry caustic blocks are used to make the mercerizing solution. The chillers used for cooling the caustic solution are in poor condition; the solution can be cooled only to room temperature. Also, the operating controls are not functioning.

In the past, there was a caustic recovery system, but this is no longer in operation. As a result, the waste water contains a high amount of caustic, and the cost of continually purchasing new caustic adds to the cost of mercerizing.

D3e. Dyeing

Predominantly reactive dyes are used, with vat and sulfur dyes used as needed. All are padded, squeezed, and then dried.

The squeeze rolls are in very poor condition and need replacing. To fix the dye, fabrics are taken to the same curing oven used for curing printed fabrics. The cured fabric is then taken to the pad steam range for washing, except when using reactive dyes. All of this equipment is in poor-to-fair condition.

D3f. Printing

There are two flat bed screen printers; only one is currently in operation. On the inoperative machine, the blanket is bad and a new blanket has been ordered. The condition of both machines is poor. Due to insufficient steam capacity, the drying section cannot keep a constant temperature; therefore, the printing must be frequently interrupted to give the drying section time to recover.

The printed fabrics are cured in a separate curing oven to assure proper fixation of the print. This oven is in fair condition.

D3g. Tenter Frames

Two clip-type tenter frames are used at this plant. Both use steam for heating with a rated maximum temperature of 120 degrees Celsius. Given the high elevation of Dire Dawa, the effective maximum temperature may be as much as 15 percent below the rated maximum.

There is a pad and squeeze roll for the application of finishing chemicals at the entrance of the tenters. These are in poor condition. The clips and the chains on both tenter frames are in very poor condition. Indeed, the overall condition of both tenters is poor.

D3h. Shrinkage Control

Although plant personnel refer to this unit as a sanforizer, it does not have the capability to chemically treat fabrics as the branded equipment would. The shrinkage control is done mechanically by a three-stage mechanical arrangement that affects both the width and the length of fabrics. This unit is in poor condition and is very little used.

D3i. Finished Fabric Inspection

There are four inspection machines; two have been used in the past for intermediate inspection of dyed fabric but are no longer in use. The other two are used for fabric inspection and measuring before folding. The rejected fabric is cut out by the inspectors, and folded and stacked separately. However, there is no system of recording fabric defects and passing them on to the quality control section.

The fabric is measured into 30-yard lengths, folded, wrapped, and baled for shipment to the market. Some fabric may be rolled and lengths of fabric may vary depending on the orders received from the customer.

D4. Cotton Yarn Bleaching and Dyeing

D4a. Scouring, Bleaching, and Extraction

Three kiers, each having a capacity of 1,400 kg per day, are used for scouring and bleaching of yarn in hank form. The cotton yarn is scoured and bleached in a single operation with an optical brightener applied in the bleach bath. After the bleach bath, the yarn is taken to one of two centrifugal extractors. All of this machinery is in fair operating condition.

See Exhibit G-8 for typical processing steps in cotton yarn bleaching.

Exhibit G-8.Process Flow For Bleached Cotton Yarn at the Dire Dawa Textile Factory

LOAD ON CARRIER
↓
BLEACH
↓
HYDRO-EXTRACTION
↓
DRY
↓
BUNDLE and BALE

D4b. Drying

Drying is done on a continuous hank dryer that is in fair condition. Its drying capacity is limited but could be increased by the installation of an axial assisted fan to remove the moist air from inside the building.

D4c. Bundling and Baling

The bleached hanks of yarn are then bundled and baled for shipping to the hand weaving industry.

D5. Acrylic Yarn Dyeing

D5a. Dyeing and Extracting

Dyeing is done in five hank dyeing kiers, each with a capacity of 100 kg. The approximate daily capacity of all five kiers is 5,000 kg, but due to a shortage of acrylic yarn, the current daily production is only about 2,000 kg per day. The condition of the kiers is fair and the quality of the dyed yarns is barely adequate.

Two centrifugal extractors, which are in fair condition, remove excess moisture from the dyed yarn. See Exhibit G-9 for typical processing steps in acrylic yarn dyeing.

Exhibit G-9. Process Flow For Bleached and Dyed Acrylic Yarn at the Dire Dawa Textile Factory

LOAD ON CARRIER
↓
BLEACH and/or DYE
↓
HYDRO-EXTRACTION
↓
DRY
↓
BUNDLE and BALE

D5b. Drying

The acrylic yarn hanks are dried in a continuous hank dryer that is quite adequate and in good condition.

E. Conclusions

E1. Comparison with International Operations

The cotton system spinning operations are by no means able to perform to international standards. Even with appropriate repairs, refurbishing, and maintenance, the condition of the buildings and air conditioning would probably preclude this. Nevertheless, from a purely technical standpoint, it is feasible to raise the spinning frames and auxiliary spinning equipment to a condition that enables consistent production of yarns suitable for the domestic market.

Because the weaving machines in this plant (apart from six looms) have been reduced to non-automatic status, they cannot be compared to international standards. The machines have virtually become motorized hand looms. Regardless, none but the aforementioned 24 Ruti looms offer a feasible prospect for production to international standards.

The narrow gauge fabric dyeing and finishing equipment is obsolete; therefore, even after renovation they would not be appropriate for producing to international standards. The hank dyeing equipment is also targeted only to a domestic market; comparison with international standards is irrelevant.

E2. Maintenance

The standard of maintenance on all machines ranged from fair to extremely poor. There was little evidence of routine or preventive maintenance. Generally, minimum maintenance was performed, often incorrectly and to a very poor standard. The rusty bearings, screeching motors, worn bearings, etc. are evidence that even simple oiling and greasing is not undertaken.

The reason often given for poor maintenance was lack of spare parts. However, the main stores at Dire Dawa were impressively organized with high bay racks accommodating a wide variety of parts. In addition to the main stores, there were satellite stores for spares. Parts that the weaving shed desperately needed were on the shelves. Over 7,000 shuttles for Toyoda looms were in stock, which is approximately a seven-year supply at current consumption rates. Yet many shuttles on the looms needed to be replaced. Also, V-belts were in abundance, yet most looms had insufficient driving belts fitted. Many V-belts had been in storage so long they had deteriorated beyond use.

The stocks of many items appeared to be out of balance. We understand that these were a legacy of the past. The satellite stores were disorganized, with new and old parts strewn around. Most of these parts will never be used or have much value. Besides, no meaningful procedures were in effect for timely notification and delivery of needed spare parts to the machinery. Until procedures are made transparent and effective, very little progress can be made.

E3. Management, Operator Competence, and Training

Dire Dawa Textile Factory currently has no general manager, only an acting manager taking care of general administrative functions. Various managers throughout the plant appeared to be reasonably well aware of the problems, but did not see themselves as responsible for taking action to alleviate them.

Operators go about their business with little enthusiasm or attention. Even though training systems of the highest international standards were introduced and implemented in most National Textile Corporation plants only a few years ago, we saw no evidence in this plant that any of those lessons had been absorbed or implemented.

E4. Quality Control

The general standard of production at the Dire Dawa Textile Factory ranges from fair to poor. There is almost a complete absence of quality control procedures. Even when the defects are cut out of finished fabric, no feedback procedure exists to correct the problems.

Of the 1,067 looms at the Dire Dawa Textile Factory, only the 24 Ruti C looms are capable of producing the high-quality cloth demanded by the market. Although these looms, like all the others, are currently used only to produce plain cloth, the cam mechanism would permit a variety of other constructions.

The color laboratory was actually better equipped than most others seen in Ethiopia. Equipment includes a wash tester, crock meter, and a xenon arc lamp for light fastness testing. Laboratory scale dyeing equipment is available for continuous pad dyeing of fabric (capable of using reactive, vat, and sulfur dyes) and for skein dyeing of yarns (both cotton and acrylic). There is also a sample dye jig that is useful for establishing dye formulas. It was apparent, however, that very little use is made of the equipment.

E5. Technical Recommendations

E5a. General

- Focus on exploiting and developing yarn manufacturing, because spinning operations are the only technically viable (cotton system) operation at Dire Dawa.
- Even for the spinning operations, buildings are unfit for upgrading with air conditioning or even with new air circulating equipment.
- Remove and dispose of scrap machinery; assess possible uses of excess space in buildings and grounds.
- Establish and maintain adequate cleaning, inspection, and maintenance programs for machinery and equipment. Out-of-service equipment located in active production areas should be kept clean to avoid contamination of work in progress.
- Initiate an effective training program for management and operators. Without this, equipment improvements and procedural changes will not yield the efficiency gains sought.

- Assess the lubricants used for mechanical parts for suitability and alter as necessary for conditions at Dire Dawa.

B5b. Spinning Operations

- Immediately replace the lags on the Kershner beaters in the opening line to stop breakage of cotton fibers.
- Repair drive boxes for the doffers on the Platt carding machines.
- Install new burnisher rolls and adjust them properly to clean card wires.
- Assess card settings and optimize them for fiber properties, production rates, and other factors.
- Conduct major repairs on or replace the drawing frames.
- Assess the need for lap forming and combing equipment; make the adjustments noted if the equipment is activated.
- Optimize the twist factors used for the rovins.
- Clean the air ducts for the end collector systems on both the rovin and spinning frames and establish a routine cleaning schedule.
- Optimize spindle speeds for the various yarn sizes spun.
- Determine and install appropriate travelers for the spinning frames.
- Stop using a petroleum jelly to lubricate the rings.
- Assess the number of cone winding machines needed in Mills Number Two and Five; overhaul those that are appropriate for spinning operations.
- Scrap the eight Koa pirn winding machines in Mill Number Five; overhaul the others that are needed for the spinning operations.

E5c. Weaving Operations

- From a technical standpoint, the weaving plants are not fit to continue operating.
- Overhaul most, and perhaps all, of the 24 Ruti C machines and locate them in an appropriate environment.
- Scrap the other 1,048 looms.

E5d. Dyeing and Finishing Operations

Given the infeasibility of continuing with the weaving machinery at Dire Dawa, the obsolescence and poor condition of its fabric dyeing and printing machinery, and the excess capacity of fabric dyeing in Ethiopia, the entire fabric dyeing operation should almost certainly be stopped. This would eliminate the need for drastic overhaul and upgrading of facilities for water supply and treatment, caustic recovery and handling, and effluent treatment and disposal.

Assuming that the yarn dyeing operations are continued, the following actions need to be taken:

- Assess the adequacy of the water treatment plant and do what is necessary to enable it to meet the reduced demands placed on it.
- Recondition the cotton and acrylic yarn dyeing kiers and the extractors that serve them.
- Establish a program of regular cleaning and maintenance and insist on having it carried out.
- Exploit the color laboratory equipment that is appropriate for yarn dyeing.

ANNEX H

TECHNICAL EVALUATION OF KOMBOLCHA TEXTILE FACTORY

ANNEX H
TECHNICAL EVALUATION OF KOMBOLCHA TEXTILE FACTORY

A. Introduction

The technical team visited the Kombolcha Textile Factory twice; first on March 26-28, 1996, then on April 22-24, 1996. The first visit focused on dyeing and finishing operations and the second on spinning and weaving operations. Established in 1985, it is one of the newer and larger factories in Ethiopia.

The plant was noteworthy for being neater and better maintained than most others in Ethiopia. Equipment taken out of service had key components removed and placed in storage. Somewhat fewer people were in the plant, and fewer people wandered around with nothing to do. The working pace seemed to be somewhat faster and more purposeful than at other Ethiopian textile plants.

This enterprise is greatly disadvantaged by its remote location and poor roads providing access to it. Getting its products shipped out must be difficult. Also, its electrical problems appear to be at least as bad as at most other plants visited.

B. Spinning Operations

Kombolcha's spinning capacity officially ranks second to Dire Dawa Textile Factory. The machinery is all Textima of 1982 vintage. Data on equipment for pre-drawing through spinning are summarized in Exhibits H-1 to H-7.

B1. Opening Line

There are four opening lines that each use four manually fed feed hoppers. There was an operator for each of the feed hoppers, although one operator for eight hoppers would be plenty. If all hoppers were in the same room, one operator would be sufficient for the volumes of this plant.

Each of these lines feed from the opening hoppers into a mixing reserve. These supply three opener cleaners in tandem. From these the stock is supplied to a feeder-cleaner. Each of these feeder cleaners supplies approximately eight cards.

Exhibit H-1. Basic card Settings at the Kombolcha Textile Factory

Location	Setting
Feed Plate to Licker-in	.010 in
Mote Bars to Licker-in	.012 in
Licker-in to Cylinder	.009 in
Back Plate to Cylinder	
Top	.034 in
Bottom	.022 in
Flats to Cylinder	
1st Stand	.010 in
2nd Stand	.010 in
3rd Stand	.010 in
4th Stand	.010 in
5th Stand	.010 in
Screen to Cylinder	
Front	3 mm
Center	2 mm
Back	1 mm
Front Plate to Cylinder	
Top	.022 in
Bottom	.034 in
Cylinder to Doffer	.003 - .004 in

Exhibit H-2. Engineering Data on Pre-Drawing Frames at the Kombolcha Textile Factory, April 23, 1996

Frame Number	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Manufacturer	Textima	Textima	Textima	Textima	Textima	Textima	Textima
Date of Manufacture	1982	1982	1982	1982	1982	1982	1982
Deliveries/Frame	2	2	2	2	2	2	2
Front Roll Diameter	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm
Meters/Minute	240	240	240	240	240	240	240
Can Size (cm)	50x100	50x100	50x100	50x100	50x100	50x100	50x100
Sliver Feed Rate	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m
Ends Up in Creel	8	8	8	8	8	8	8
Sliver Delivery Rate	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m
Mechanical Draft	8	8	8	8	8	8	8
Type of Drafting	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3
Roll Set 1-2	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm
Roll Set 2-3	39 mm	39 mm	39 mm	39 mm	39 mm	39 mm	39 mm
Roll Set 3-4	--	--	--	--	--	--	--
Roll Set 4-5	--	--	--	--	--	--	--
Autoleveler	No	No	No	No	No	No	No

Exhibit H-3. Engineering Data on Breaker Drawing Frames at the Kombolcha Textile Factory, April 23, 1996

Frame Number	**1-I**	**2-I**	**3-I**	**4-I**	**5-I**	**6-I**	**7-I**	**8-I**	**9-I**
Manufacturer	Textima	Textima	Textima	Textima	Textima	Textima	Textima	Textima	Textima
Date of Manufacture	1982	1982	1982	1982	1982	1982	1982	1982	1982
Deliveries/ Frame	2	2	2	2	2	2	2	2	2
Front Roll Diameter	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm
Meters/ Minute	240	240	240	240	240	240	240	240	240
Can Size (cm)	50x100	50x100	50x100	50x100	50x100	50x100	50x100	50x100	50x100
Sliver Feed Rate	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m
Ends Up in Creel	8	8	8	8	8	8	8	8	8
Sliver Delivery Rate	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m
Mechanical Draft	8	8	8	8	8	8	8	8	8
Type of Drafting	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3
Roll Set 1-2	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm
Roll Set 2-3	39 mm	39 mm	39 mm	39 mm	39 mm	39 mm	39 mm	39 mm	39 mm
Roll Set 3-4	--	--	--	--	--	--	--	--	--
Roll Set 4-5	--	--	--	--	--	--	--	--	--
Autoleveler	No	No	No	No	No	No	No	No	No

Exhibit H-4.Engineering Data on Finisher Drawing Frames at the Kombolcha Textile Factory, April 23, 1996

Frame Number	**1-I**	**2-I**	**3-I**	**4-I**	**5-I**	**6-I**	**7-I**	**8-I**	**9-I**
Manufacturer	Textima	Textima	Textima	Textima	Textima	Textima	Textima	Textima	Textima
Date of Manufacture	1982	1982	1982	1982	1982	1982	1982	1982	1982
Deliveries/ Frame	2	2	2	2	2	2	2	2	2
Front Roll Diameter	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm
Meters/ Minute	240	240	240	240	240	240	240	240	240
Can Size (cm)	50x100	50x100	50x100	50x10050	50x100	50x100	50x100	50x100	50x100
Sliver Feed Rate	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m
Ends Up in Creel	8	8	8	8	8	8	8	8	8
Sliver Delivery Rate	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m	5 g/m
Mechanical Draft	8	8	8	8	8	8	8	8	8
Type of Drafting	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3	3 over 3
Roll Set 1-2	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm	44 mm
Roll Set 2-3	38 mm	38 mm	38 mm	38 mm	38 mm	38 mm	38 mm	38 mm	38 mm
Roll Set 3-4	--	--	--	--	--	--	--	--	--
Roll Set 4-5	--	--	--	--	--	--	--	--	--
Autoleveler	No	No	No	No	No	No	No	No	No

Exhibit H-5.Basic Engineering Data on Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	No. of Spindles	Year Made	Ring Diameter	Front Roll Diameter	Front Roll RPM	Spindle RPM
1	Textima	360	1982	60 mm	27 mm	167	8,600
2	Textima	360	1982	60 mm	27 mm	167	8,600
3	Textima	360	1982	60 mm	27 mm	167	8,600
4	Textima	360	1982	60 mm	27 mm	167	8,600
5	Textima	360	1982	60 mm	27 mm	167	8,600
6	Textima	500	1982	48 mm	27 mm	156	9,000
7	Textima	500	1982	48 mm	27 mm	156	9,000
8	Textima	500	1982	48 mm	27 mm	156	9,000
9	Textima	500	1982	48 mm	27 mm	167	8,600
10	Textima	500	1982	48 mm	27 mm	167	8,600
11	Textima	500	1982	48 mm	27 mm	162	10,700
12	Textima	500	1982	48 mm	27 mm	167	8,600
13	Textima	500	1982	48 mm	27 mm	162	10,700
14	Textima	500	1982	48 mm	27 mm	162	10,700
15	Textima	500	1982	48 mm	27 mm	162	10,700
16	Textima	500	1982	48 mm	27 mm	162	10,700
17	Textima	500	1982	48 mm	27 mm	162	10,700
18	Textima	500	1982	48 mm	27 mm	162	10,700
19	Textima	500	1982	48 mm	27 mm	162	10,700
20	Textima	500	1982	48 mm	27 mm	162	10,700
21	Textima	500	1982	48 mm	27 mm	162	9,000
22	Textima	500	1982	45 mm	27 mm	162	9,000
23	Textima	500	1982	45 mm	27 mm	162	9,000
24	Textima	500	1982	45 mm	27 mm	162	10,700
25	Textima	500	1982	45 mm	27 mm	156	11,000

Exhibit H-5 (Continued). Basic Engineering Data on Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	No. of Spindles	Year Made	Ring Diameter	Front Roll Diameter	Front Roll RPM	Spindle RPM
26	Textima	500	1982	45 mm	27 mm	156	11,000
27	Textima	500	1982	45 mm	27 mm	156	11,000
28	Textima	500	1982	45 mm	27 mm	156	11,000
29	Textima	500	1982	45 mm	27 mm	156	11,000
30	Textima	500	1982	45 mm	27 mm	151	11,300
31	Textima	500	1982	45 mm	27 mm	131	11,300
32	Textima	500	1982	45 mm	27 mm	156	11,000
33	Textima	500	1982	45 mm	27 mm	156	11,000
34	Textima	500	1982	45 mm	27 mm	156	11,300
35	Textima	500	1982	45 mm	27 mm	156	11,300
36	Textima	500	1982	45 mm	27 mm	162	10,700
37	Textima	500	1982	45 mm	27 mm	162	10,700
38	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
39	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
40	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
41	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
42	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
43	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
44	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
45	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
46	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
47	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
48	Textima	360	1982	60 mm	27 mm	167	8,600
49	Textima	360	1982	60 mm	27 mm	167	8,600
50	Textima	360	1982	60 mm	27 mm	167	8,600

Exhibit H-5 (Continued). Basic Engineering Data on Spinning Machine at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	No. of Spindles	Year Made	Ring Diameter	Front Roll Diameter	Front Roll RPM	Spindle RPM
51	Textima	360	1982	60 mm	27 mm	167	8,600
52	Textima	360	1982	60 mm	27 mm	167	8,600
53	Textima	500	1982	48 mm	27 mm	167	8,600
54	Textima	500	1982	48 mm	27 mm	167	8,600
55	Textima	500	1982	48 mm	27 mm	167	8,600
56	Textima	500	1982	48 mm	27 mm	167	8,600
57	Textima	500	1982	48 mm	27 mm	156	9,000
58	Textima	500	1982	48 mm	27 mm	167	8,600
59	Textima	500	1982	48 mm	27 mm	162	10,700
60	Textima	500	1982	48 mm	27 mm	162	10,700
61	Textima	500	1982	48 mm	27 mm	162	10,700
62	Textima	500	1982	48 mm	27 mm	162	10,700
63	Textima	500	1982	48 mm	27 mm	162	10,700
64	Textima	500	1982	48 mm	27 mm	162	10,700
65	Textima	500	1982	48 mm	27 mm	162	10,700
66	Textima	500	1982	48 mm	27 mm	162	10,700
67	Textima	500	1982	48 mm	27 mm	162	10,700
68	Textima	500	1982	45 mm	27 mm	162	10,700
69	Textima	500	1982	45 mm	27 mm	162	9,000
70	Textima	500	1982	45 mm	27 mm	162	10,700
71	Textima	500	1982	45 mm	27 mm	156	11,000
72	Textima	500	1982	45 mm	27 mm	156	11,000
73	Textima	500	1982	45 mm	27 mm	156	11,000
74	Textima	500	1982	45 mm	27 mm	156	11,000
75	Textima	500	1982	45 mm	27 mm	156	11,000

Exhibit H-5 (Concluded). Basic Engineering Data on Spinning Machine at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	No. of Spindles	Year Made	Ring Diameter	Front Roll Diameter	Front Roll RPM	Spindle RPM
76	Textima	500	1982	45 mm	27 mm	156	11,000
77	Textima	500	1982	45 mm	27 mm	156	11,000
78	Textima	500	1982	45 mm	27 mm	156	11,000
79	Textima	500	1982	45 mm	27 mm	156	11,000
80	Textima	500	1982	45 mm	27 mm	131	11,300
81	Textima	500	1982	45 mm	27 mm	131	11,300
82	Textima	500	1982	45 mm	27 mm	162	10,700
83	Textima	500	1982	45 mm	27 mm	162	10,700
84	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
85	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
86	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
87	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
88	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
89	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
90	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
91	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
92	Textima	500	1982	45 mm	27 mm	Stopped	Stopped
93	Textima	500	1982	45 mm	27 mm	Stopped	Stopped

Exhibit H-6. Engineering Data on Set-up of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Yarn Count	Twist Gear	Twists per Inch	Twist Multiplier	Draft Gear	Traveler No.
1	Textima	24 NM	32	15.37	4.08	38	7
2	Textima	24 NM	32	15.37	4.08	38	7
3	Textima	24 NM	32	15.37	4.08	38	7
4	Textima	24 NM	32	15.37	4.08	38	7
5	Textima	24 NM	32	15.37	4.08	38	7
6	Textima	27 NM	40	17.27	4.32	36	6
7	Textima	27 NM	40	17.27	4.32	36	6
8	Textima	27 NM	40	17.27	4.32	36	6
9	Textima	24 NM	32	15.37	4.08	38	7
10	Textima	24 NM	32	15.37	4.08	38	7
11	Textima	34 NM	36	19.74	4.40	36	4
12	Textima	24 NM	32	15.37	4.08	38	7
13	Textima	34 NM	36	19.74	4.40	36	4
14	Textima	34 NM	36	19.74	4.40	36	4
15	Textima	34 NM	36	19.74	4.40	36	4
16	Textima	34 NM	36	19.74	4.40	36	4
17	Textima	34 NM	36	19.74	4.40	36	4
18	Textima	34 NM	36	19.74	4.40	36	4
19	Textima	34 NM	36	19.74	4.40	36	4
20	Textima	34 NM	36	19.74	4.40	36	4
21	Textima	35.5 NM	30	16.69	3.64	36	3
22	Textima	35.5 NM	30	16.69	3.64	36	3
23	Textima	35.5 NM	30	16.69	3.64	36	3
24	Textima	34 NM	36	19.74	4.40	36	4
25	Textima	40.5 NM	33	21.08	4.33	33	1

Exhibit H-6 (Continued). Engineering Data on Set-up of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Yarn Count	Twist Gear	Twists per Inch	Twist Multiplier	Draft Gear	Traveler No.
26	Textima	40.5 NM	33	21.08	4.33	33	1
27	Textima	40.5 NM	33	21.08	4.33	33	1
28	Textima	40.5 NM	33	21.08	4.33	33	1
29	Textima	40.5 NM	33	21.08	4.33	33	1
30	Textima	54 NM	28	25.83	4.57	38	1
31	Textima	54 NM	28	25.83	4.57	38	1
32	Textima	40.5 NM	32	21.08	4.33	33	1
33	Textima	40.5 NM	32	21.08	4.33	33	1
34	Textima	54 NM	28	25.83	4.57	38	1
35	Textima	54 NM	28	25.83	4.57	38	1
36	Textima	34 NM	36	19.74	4.40	36	6
37	Textima	34 NM	36	19.74	4.40	36	6
38	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
39	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
40	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
41	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
42	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
43	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
44	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
45	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
46	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
47	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
48	Textima	24 NM	32	15.37	4.08	38	7
49	Textima	24 NM	32	15.37	4.08	38	7
50	Textima	24 NM	32	15.37	4.08	38	7

Exhibit H-6 (Continued). Engineering Data on Set-up of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Yarn Count	Twist Gear	Twists per Inch	Twist Multiplier	Draft Gear	Traveler No.
51	Textima	24 NM	32	15.37	4.08	38	7
52	Textima	24 NM	32	15.37	4.08	38	7
53	Textima	24 NM	32	15.37	4.08	38	7
54	Textima	24 NM	32	15.37	4.08	38	7
55	Textima	24 NM	32	15.37	4.08	38	7
56	Textima	24 NM	32	15.37	4.08	38	7
57	Textima	27 NM	32	17.27	4.32	36	6
58	Textima	24 NM	32	15.37	4.08	38	7
59	Textima	34 NM	36	19.74	4.40	36	4
60	Textima	24 NM	32	15.37	4.08	38	7
61	Textima	24 NM	32	15.37	4.08	38	7
62	Textima	24 NM	32	15.37	4.08	38	7
63	Textima	24 NM	32	15.37	4.08	38	7
64	Textima	24 NM	32	15.37	4.08	38	7
65	Textima	24 NM	32	15.37	4.08	38	7
66	Textima	24 NM	32	15.37	4.08	38	7
67	Textima	34 NM	36	19.74	4.40	36	4
68	Textima	34 NM	36	19.74	4.40	36	4
69	Textima	35.5 NM	30	19.74	4.40	36	3
70	Textima	34 NM	36	19.74	4.40	36	4
71	Textima	40 NM	32	21.08	4.33	33	1
72	Textima	40 NM	32	21.08	4.33	33	1
73	Textima	40 NM	32	21.08	4.33	33	1
74	Textima	40 NM	32	21.08	4.33	33	1
75	Textima	40 NM	32	21.08	4.33	33	1

Exhibit H-6 (Concluded). Engineering Data on Set-up of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Yarn Count	Twist Gear	Twists per Inch	Twist Multiplier	Draft Gear	Traveler No.
76	Textima	40 NM	32	21.08	4.33	33	1
77	Textima	40 NM	32	21.08	4.33	33	1
78	Textima	40 NM	32	21.08	4.33	33	1
79	Textima	40 NM	32	21.08	4.33	33	1
80	Textima	54 NM	28	25.83	4.57	38	1
81	Textima	54 NM	28	25.83	4.57	38	1
82	Textima	34 NM	36	19.74	4.40	36	4
83	Textima	34 NM	36	19.74	4.40	36	4
84	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
85	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
86	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
87	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
88	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
89	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
90	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
91	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
92	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped
93	Textima	Stopped	Stopped	Stopped	Stopped	Stopped	Stopped

Exhibit H-7. Engineering Data on Operating Settings of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Draft	Roll Set 1-2	Roll Set 3-4	Tensor Space	Foot-in Vacuum	Head-in Vacuum
1	Textima	D 304	44 mm	46 mm	6 mm		
2	Textima	D 304	44 mm	46 mm	6 mm		
3	Textima	D 304	44 mm	46 mm	6 mm		
4	Textima	D 304	44 mm	46 mm	6 mm	4.3	3.0
5	Textima	D 304	44 mm	46 mm	4 mm		
6	Textima	D 304	44 mm	46 mm	4 mm		
7	Textima	D 304	44 mm	46 mm	4 mm		
8	Textima	D 304	44 mm	46 mm	4 mm		
9	Textima	D 304	44 mm	46 mm	4 mm		
10	Textima	D 304	44 mm	46 mm	4 mm		
11	Textima	D 304	44 mm	46 mm	4 mm		
12	Textima	D 304	44 mm	46 mm	4 mm		
13	Textima	D 304	44 mm	46 mm	4 mm		
14	Textima	D 304	44 mm	46 mm	4 mm		
15	Textima	D 304	44 mm	46 mm	4 mm		
16	Textima	D 304	44 mm	46 mm	4 mm	5.3	1.7
17	Textima	D 304	44 mm	46 mm	4 mm		
18	Textima	D 304	44 mm	46 mm	4 mm		
19	Textima	D 304	44 mm	46 mm	4 mm		
20	Textima	D 304	44 mm	46 mm	4 mm		
21	Textima	D 304	44 mm	46 mm	4 mm		
22	Textima	D 304	44 mm	46 mm	4 mm		
23	Textima	D 304	44 mm	46 mm	4 mm		
24	Textima	D 304	44 mm	46 mm	4 mm		
25	Textima	D 304	44 mm	46 mm	4 mm		

Exhibit H-7 (Continued). Engineering Data on Operating Settings of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Draft	Roll Set 1-2	Roll Set 3-4	Tensor Space	Foot-in Vacuum	Head-in Vacuum
26	Textima	D 304	44 mm	46 mm	4 mm		
27	Textima	D 304	44 mm	46 mm	4 mm		
28	Textima	D 304	44 mm	46 mm	4 mm		
29	Textima	D 304	44 mm	46 mm	4 mm		
30	Textima	D 304	44 mm	46 mm	4 mm		
31	Textima	D 304	44 mm	46 mm	4 mm		
32	Textima	D 304	44 mm	46 mm	4 mm		
33	Textima	D 304	44 mm	46 mm	4 mm		
34	Textima	D 304	44 mm	46 mm	4 mm		
35	Textima	D 304	44 mm	46 mm	4 mm		
36	Textima	D 304	44 mm	46 mm	4 mm		
37	Textima	D 304	44 mm	46 mm	4 mm		
38	Textima	D 304	44 mm	46 mm	Stopped		
39	Textima	D 304	44 mm	46 mm	Stopped		
40	Textima	D 304	44 mm	46 mm	Stopped		
41	Textima	D 304	44 mm	46 mm	Stopped		
42	Textima	D 304	44 mm	46 mm	Stopped		
43	Textima	D 304	44 mm	46 mm	Stopped		
44	Textima	D 304	44 mm	46 mm	Stopped		
45	Textima	D 304	44 mm	46 mm	Stopped		
46	Textima	D 304	44 mm	46 mm	Stopped		
47	Textima	D 304	44 mm	46 mm	Stopped		
48	Textima	D 304	44 mm	46 mm	6 mm		
49	Textima	D 304	44 mm	46 mm	6 mm		
50	Textima	D 304	44 mm	46 mm	4 mm		

Exhibit H-7 (Continued). Engineering Data on Operating Settings of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Draft	Roll Set 1-2	Roll Set 3-4	Tensor Space	Foot-in Vacuum	Head-in Vacuum
51	Textima	D 304	44 mm	46 mm	6 mm		
52	Textima	D 304	44 mm	46 mm	6 mm		
53	Textima	D 304	44 mm	46 mm	4 mm		
54	Textima	D 304	44 mm	46 mm	4 mm		
55	Textima	D 304	44 mm	46 mm	4 mm		
56	Textima	D 304	44 mm	46 mm	4 mm		
57	Textima	D 304	44 mm	46 mm	4 mm	4.1	1.8
58	Textima	D 304	44 mm	46 mm	4 mm		
59	Textima	D 304	44 mm	46 mm	4 mm		
60	Textima	D 304	44 mm	46 mm	4 mm		
61	Textima	D 304	44 mm	46 mm	4 mm		
62	Textima	D 304	44 mm	46 mm	4 mm		
63	Textima	D 304	44 mm	46 mm	4 mm		
64	Textima	D 304	44 mm	46 mm	4 mm		
65	Textima	D 304	44 mm	46 mm	4 mm		
66	Textima	D 304	44 mm	46 mm	4 mm		
67	Textima	D 304	44 mm	46 mm	4 mm		
68	Textima	D 304	44 mm	46 mm	4 mm		
69	Textima	D 304	44 mm	46 mm	4 mm		
70	Textima	D 304	44 mm	46 mm	4 mm		
71	Textima	D 304	44 mm	46 mm	4 mm		
72	Textima	D 304	44 mm	46 mm	4 mm		
73	Textima	D 304	44 mm	46 mm	4 mm		
74	Textima	D 304	44 mm	46 mm	4 mm		
75	Textima	D 304	44 mm	46 mm	4 mm		

Exhibit H-7 (Concluded).Engineering Data on Operating Settings of Spinning Machines at the Kombolcha Textile Factory, April 25, 1996

Frame No.	Manufacturer	Draft	Roll Set 1-2	Roll Set 3-4	Tensor Space	Foot-in Vacuum	Head-in Vacuum
76	Textima	D 304	44 mm	46 mm	4 mm		
77	Textima	D 304	44 mm	46 mm	4 mm		
78	Textima	D 304	44 mm	46 mm	4 mm		
79	Textima	D 304	44 mm	46 mm	4 mm		
80	Textima	D 304	44 mm	46 mm	4 mm		
81	Textima	D 304	44 mm	46 mm	4 mm		
82	Textima	D 304	44 mm	46 mm	4 mm		
83	Textima	D 304	44 mm	46 mm	4 mm		
84	Textima	D 304	44 mm	46 mm	Stopped		
85	Textima	D 304	44 mm	46 mm	Stopped		
86	Textima	D 304	44 mm	46 mm	Stopped		
87	Textima	D 304	44 mm	46 mm	Stopped		
88	Textima	D 304	44 mm	46 mm	Stopped		
89	Textima	D 304	44 mm	46 mm	Stopped		
90	Textima	D 304	44 mm	46 mm	Stopped		
91	Textima	D 304	44 mm	46 mm	Stopped		
92	Textima	D 304	44 mm	46 mm	Stopped		
93	Textima	D 304	44 mm	46 mm	Stopped		

B2. Carding

Approximately one-half of the 60 cards in this plant have been rebuilt and are running. The attention to rebuilding is commendable; unfortunately, some of it appears to be unnecessary. Examination of some cards being readied for replacement of the cylinders and doffer wires led to the conclusion that with proper maintenance they would likely produce good stock for many months, or even years. Therefore, the investment of about Br 20,000 to Br 24,000 could be better used to fix other problems.

From conversations with the head of spinning and the technicians in this department, it appears that this unnecessary rebuilding follows from a well-intentioned effort to apply advice given by a German expert who had visited the plant. The misunderstanding seems to be in interpreting recommended (and appropriate) inspection schedules as replacement schedules, but we concluded from our inspection that some of the rebuilding was unnecessary.

In several instances, card flats were observed to be not as clean as they should be to adequately control contamination in the sliver. It would also be helpful if a more concerted effort were made to keep the flats sharper; the better the flats' condition, the longer the service life of the cylinder wire clothing. It is much cheaper to keep flats sharp than to replace cylinder wire.

It was also noted that some of the card settings were very close; especially the cylinder-to-doffer setting. While fairly close settings are generally desirable, some of these risk damage to clothing wire and the strength of the cotton fiber.

Due to the very close setting on the cards, the levelness of the cards is more critical. A check revealed several cards that were off level by as much as ten mm side-to-side. This is enough to break the new wire put on the cards (as had apparently happened to one of them); therefore, leveling the machines should be part of repairing them.

The cards are equipped with Uster Autolevelers, but most of them are not functioning. This is most likely due to problems with the electrical supply system; it was cut off to all of the Kombolcha area—except to the plant—on both Tuesdays the team was there.

B3. Lap Forming and Combing

It was explained that all lap forming and combing equipment was idle due to lack of demand for combed cotton. The equipment was carefully covered, was in fact operational, and appeared capable of doing a good job.

There are several major markets in the world where a premium is now paid for combed ring spun yarn, primarily for knitted goods. Yet, even if this plant could connect with these markets and make good-quality cones of such yarn, we suspect that the very rough roads would damage the yarn cones.

B4. Drawing

All the drawing equipment is Textima two-delivery auto-doffing, with a conventional three-line drafting system. Maintenance of these frames appears to be adequate; its continuation should allow several more years of useful life from them.

It was noted that the roll spacing for the pre-drawing and breaker drawing lines are set the same, which is correct if the stock fed to the breaker drawing is not combed. The finisher drawing has a very questionable setting, however, with a slightly tighter spacing on the front zone than is the case with the breaker frames. Normally, it is just the opposite; that is, the finisher is more open than the breaker. This reversal of recommended settings probably explains why there is an increased variation of the finisher drawing compared to the breaker drawing.

The drawing is not equipped with autoleveling. This would not be a major concern if the autoleveling system at the cards were working properly; since it is not, autoleveling at drawing would be much more advantageous.

Another problem that hurts yarn quality is the fact that the delivered weight of the drawing stock is five grams/meter at all stages of the drawing process. A better-quality rovin and yarn is produced if the sliver weight is reduced at each subsequent process. Thus, a better arrangement would be to run the delivery of the first drawing at 4.5 grams/meter and the second drawing at 4 grams/meter.

B5. Rovin

There are 13 rovin frames, although 2 were out of service due to damage from a fire about 4 years ago. One of these damaged frames was going to be ready for renewed operation within days, and it was indicated that the other was expected to be put back in service within the next two months.

These rovin frames have a three-roll, double-apron drafting system that is capable of producing very good rovin. It was a pleasure to note that there was no evidence of an excessive number of missing aprons on these frames, as noted at other plants visited.

B6. Ring Spinning

From a technical standpoint, the spinning department is perhaps the best in Ethiopia. Still, several technical problems need to be addressed for it to reach its potential.

Of the 93 spinning frames installed in this installation, 20 have been taken out of service. It is a credit to management that the top rolls and top cages had been removed and placed in appropriate storage, so that the machines could quickly be put back in use when needed.

During the last few months, management has been implementing a preventive maintenance program for spinning. However, the schedule appears to be erroneously based on operating hours rather than man-hours. With the proposed schedule, the spinning department will be covered only once every eight years. This was discussed with the production manager and suggestions offered for altering the schedule.

The pneumatic cleaning system appears to be in good condition. Measurements with the digital manometer verified that it is operating well. The construction of the vacuum cabinet, fan, and impeller is among the best seen in Ethiopia.

Top rolls were found to be in generally good condition; however, it appears that they are buffed with a slight taper along the length of the rolls. Also, some of the rolls are not buffed adequately to remove all the grooves that result from normal wear.

It was observed that the sizes of tensor spacers are mixed on the same frame. It was explained that there were not enough tensor spacers of the correct sizes to have them all the same. Since they are relatively easy and inexpensive to order, we suggest they order them immediately, but use the spacers on the cage sections in the store room in the meantime. The borrowed spacers should then be replaced when the order arrives.

It appears that some tensor spacers settings may compromise yarn strength too much to increase yarn evenness. If so, the numbers of small slubs and short thin places will be increased, causing problems in weaving operations. These were noted to contribute to many of the loom stops.

If yarn strength is a problem, it could probably be improved by raising the relative humidity in the spinning area. Readings with the digital Hygothermometer indicated a relative humidity of about 36 percent; if this could be increased about five percentage points, the breaking strength of the yarn should increase somewhat.

On both sides of the spinning frames there are extra rods equipped with bobbin holders to store extra supply packages for spinning. This can be a good technique for the efficient handling of packages; however, it is important that the condition and age of these packages be monitored. If they are allowed to stay on the holders too long, the result may be to mix old and new rovins. This may cause problems such as dye streaks in the fabrics produced.

B7. Winding

Management informed us that the amount of time and money spent maintaining the Elitex winding equipment is great. Unfortunately, this is to be expected with this equipment, which is similar to that at the Arba Minch factory. However, the overall maintenance of this equipment is better than at Arba Minch.

In spite of maintenance efforts, there are some problems with tension control end-to-end. Resulting variations in cone sizes are affecting overall tension on the warpers and showing up as ridges on the beam face.

The electronic digital manometer was used to check every winding machine in the spinning area. Measurements revealed several pneumatic tubes that were choked up enough to interfere with efficient operation.

One Elitex cone winder was located in the warping room and used for rewinding cone ends. It was operating fairly well, but several bearings were dry and noisy. Also, the traveling cleaner was not operable.

Seven Scharer automatic pirn winding machines were in very good condition and operating in a fully automatic mode. Four machines were running, one was empty, and two were covered up.

B8. Reeling

Three reels, each with 80 positions, have recently been installed at this plant to supply hanks of yarn to the home knitting market. This low-tech equipment appeared to be in good condition.

B9. Twisting

The plant uses two-for-one twisters built by Elitex, under license from Volkman of Germany. Inspection of spindle speeds revealed larger-than-acceptable variations. The variations were apparently due to either a dragging in the tensioning pulleys of the tangential belt drive or to defective bearings of the individual spindles. This needs to be corrected as soon as possible, since every single turn of difference in spindle speed translates into two turns of twist difference.

C. Weaving Operations

The Kombolcha factory has 466 looms, with appropriate supporting equipment to run the weaving operations.

C1. Warping

Four Elitex Warping machines are installed, three of which are currently in operation. It was noted on the first visit to Kombolcha that variations in yarn tensions and reed distributions showed up as ridges on the surface of the warper beams. There were variations in full cone sizes and package densities. Of course, these problems have to be corrected at the winder, and a marked improvement in the condition of the creels was observed on the second visit. Individual yarn tensions were consistent at 9 to 10 grams per thread.

It was noted that some of the tension devices contained additional discs, as well as excess fly between the discs. The creel peg alignment was good, resulting in beams that were of good quality. Trapped ends were observed in the warp beams at the back of the sizing machines, however, indicating the need to re-emphasize good warping practices.

This plant has a practice, probably instituted by the original operators, of storing yarn for one week after winding before sending it to warping. This appears unnecessary because it adds significantly to inventory handling costs and the risk of mixing different yarn lots in the same warp. Yarn should always be used on a first-in, first-out basis. While standard operating procedure at Kombolcha is to do this, it is no doubt difficult with the stacked bin system used for storage. When a given yarn count for beaming runs low, it seems likely that a few older packages will occasionally be mixed in with current production. Whenever this happens, there is an increased risk of color differences in either the greige or finished fabric. Indeed, we saw evidence of this problem at the beamer; also, a problem with color differentials was encountered in the finishing department during our visit.

C2. Slashing/Sizing

Two Rotal sizing machines are installed, but during our visits they were engaged primarily in dry slashing; i.e., the yarn was combined on the warp beams without an application of size and without use of the drying cylinders. This practice should be avoided, since operating a drying range without steam fed to the cylinders inflicts damage on the rotary joints. Also, the tension required in the passage through the drying machine will damage the yarn and drying cases. The preferred technique for slashing only is to combine the warp beams behind a headstock, but one is not installed at Kombolcha.

The fact that very fine particles were found to be blocking the air filtration screens in the weaving air conditioning plant confirms that the warps are consistently over-dried. This is because the over-baked size is easily abraded in weaving and over-drying creates finer particles.

During a limited observation of the full use of the sizing machines, the following problems were noted:

- The two front warp beams in the warp creel were out of alignment. Rather than setting them correctly, the operator compensated by using a vertical bar to direct the yarn sideways.

- The ETV hygromatic moisture monitoring control was switched on but not permitted to control the speed of the machine. When it was switched to automatic, the operator became anxious and quickly overrode it because the yarn was in danger of becoming over-dried. The drying monitor gave an "out of range" reading until the operating speed was doubled.

- For the type of yarn run (54 NM for sheeting), the cylinder temperatures and temperature profile were set too high. Furthermore, the actual cylinder temperatures were significantly higher than the settings, indicating a steam control problem. (See comments on the boiler house and water treatment.)

- There appeared to be a speed indicator reliability problem; it occasionally remained at 12 m/min when the machine was stopped.

C3. Beam Storage and Drawing-in

All warp beams were held in an automated beam storage facility. The facility was well maintained and clean, with no old or redundant beams lying around. The racks were 70 percent full. The only problem observed in this area was that the electrical control panels had been left open on all the machines. This is not only a dangerous practice, but will also shorten the life of the equipment due to dirt, dust, and fly entering the boxes.

The drawing-in department contained four machines; two were in use. Two additional stands had been created for wide beams. It was a pleasure to see that the healds and reeds used were in excellent condition. The main problem noted was that many Egelhaaf aluminum heald frame profiles were badly damaged around the connecting link bearings. The steel inserts on them were also very rusty, indicating that they were not manually lubricated when they were installed in the Saurer Diederich looms.

C4. Weaving

The weaving machines were located in three adjacent rooms. The main hall contained 191 Saurer Diederich rapier looms, 52 Utas shuttle towel looms, and 110 plain Utas shuttle looms of different widths. An adjacent room contained 65 Saurer Diederich rapier looms, while a third room contained 48 Utas shuttle looms. The total count was 466 weaving machines (256 Saurer Diederich and 210 Utas looms). This does not correspond with the information collected by the PESA Textile Task Force, which indicated 300 Saurer Diederich and 162 Utas looms. It would be preferable if there were 300 Saurer Diederich looms because they produce better quality cloth more economically than the Utas machines.

In the main hall, 99 of the Saurer Diederich looms were fitted with big-batch winding devices. However, 40 of these were inoperable because of the absence of the main drive electromagnetic clutches. A further 92 Saurer Diederich looms were configured with normal cloth roll devices, but 36 of these machines were also inoperable for the same reason.

All 52 Utas shuttle towel looms were in operation, but 12 of them were weaving fabric other than towels. All the Utas looms were originally automatic machines with rotary pirn batteries, but the batteries were inoperative on all machines throughout the mill. These machines had therefore been relegated to nonautomatic status. The main hall contained an additional 110 Utas looms that were all operating and were weaving plain and twill fabrics.

Of the 65 Saurer Diederich looms in the adjacent hall, 16 (25 percent) were inoperable. On average, only 24 machines were running at any one time; this amounts to 40 percent of installed capacity and 49 percent of functioning capacity.

The 48 Utas looms in the third hall were being installed and reconditioned. Unfortunately, the battery mechanisms were not being renovated and were left inoperable. Sixteen of the looms were ready to be operated, 4 were in the process of being gaited, and 28 were still in a stripped-down state.

Major problems observed with the Saurer Diederich looms were the following:

- The Electro magnetic clutches had failed and been removed.
- Selvedge cutters were missing on many looms. (In the second hall, only 31 of the 49 operable machines (63 percent) were fitted with selvedge cutters.)
- The rapiers had several sharp edges that were covered by clear tape.
- The left-hand rapiers often had components missing.
- There was too much free play in the rapier movement.
- There was an excessive number of spare warp ends on the warp beams.
- Several reeds had been damaged by rapiers.
- Crossed and fed ends were incorrectly routed. (It would be beneficial to fix a stretched spring between two brackets fitted behind the back warp roller, over which the few troublesome warp threads could be fed.)
- Selvedges were inappropriate, particularly on the drills.
- The motor drive pinions, originally made from Tufnol, were being replaced by copies made from brass. This is dangerous, because the drive pinion is designed as a "weak" point to fail in the event of a machine jam. Replacement pinions should be machined from high-density engineering plastic, which can be done economically.

Selvedge construction on the Saurer Diederich looms is a major current problem that results in several fabric quality defects and handling problems in finishing. The weaving manager tried to correct the problem, but the material or equipment required to remedy the problem was not available. Heavy drill was being woven on the Saurer Diederich looms and the selvedge was much thicker than the body of the fabric. The result was deformed and stretched sides. Yet if the heavier selvedge was not provided, the edge was too weak.

When the selvedge has a density or construction different from the body of the fabric, separate selvedge bobbins (sometimes referred to as selvedge beams) are nearly always essential, along with the additional heald frames and associated equipment that may be required. The Saurer Diederich looms were not equipped with these devices.

Under these conditions, a complete solution is impossible. A partial solution is to use for the leno yarn either a two-ply polyester/cotton yarn or a core-spun polyester/cotton yarn and to remove some additional ends in the selvedge. In addition, selvedge bobbins can be put in, but they should be applied in weaving the same construction as the main fabric (because this would require no additional heald frames). These steps will minimize the problem, but not eliminate it completely.

Major problems observed with the Utas towel looms were:

- The operator did not remove broken picks or attempt to find the correct pick.

- Many pile warp ends broke, particularly the dyed yarn.

- All the warp threads, both ground and pile, passed through one set of 4-row droppers. This causes excessive warp abrasion and the latching of broken threads. It would be better to install an additional 2-row set of drop wires to receive the pile warp only and configure the warp paths so that the pile warp does not pass through the ground drop wires.

- Strips of paper had been inserted into the drop wires, or they had been bent over to prevent them from dropping. Perhaps the operator was experiencing problems with slack ends; if so, the problem should be corrected rather than the drop wires made inoperable.

- Slack pile ends were observed (though the cause could not be determined).

- Healds that were broken at the bottom were not replaced.

- The pile roller feed pawl mechanism was incorrectly set on many machines. Instead of the pawl turning the feed roller, the pile warp often pulled the roller around. As the towels were the same pile height, the feed pawl levers should be set correctly to the same settings. They presently vary between the two extreme limits available.

- The center weft fork caught on the warp and left oil marks. It should be replaced by a side weft fork, which is allowed on these machines.

- Shuttles sometimes struck the pickers incorrectly; the pickers need to be adjusted.

- Several shuttles were badly worn and should be replaced.

The remaining Utas looms also suffered from some of the above problems. In addition, they exhibited the following problems:

- Pirns were inserted under the edge of the cloth at the breast beam—a very bad practice. Presumably this was done to try to correct other problems such as slack side, splintered guide, temple problems, etc. The original problem should be solved.

- Weft cutters were inoperative or not fitted. As a result, there was a tangled web of weft ends around the cloth roller.

- Temples frequently marked the cloth; they should be removed and repaired.

- Side weft forks were not used.

- Differing weights of drop wires were used on the same drop wire bar.

C5. Greige Fabric Inspection and Folding

Ten Investa fabric inspection machines are installed. These operated reasonably well, although the drive clutch mechanism needed attention on several machines. Fabric guidance was a problem, apparently due to incorrect positioning of the fabric truck (or perhaps poor positioning of cloth in the cloth truck). The operators unrolling the fabric need to pay more attention to delivering it in a suitable condition for inspection.

Fabric was inspected, burled, and monitored in one passage over a machine. This required two persons. Precise clerical records were kept of the condition of each piece of cloth, with faults classified into 28 different categories. These need to be grouped together to give more meaningful information. It appeared that the data collected were not used to prevent future delivery of faulty fabrics. No weaver or fitter was ever called to see a faulty piece of fabric as far as we could determine. Also, the fabric faults observed at the looms indicated little additional feedback.

It was noted that only transmitted light (i.e., back lighting) was used to inspect the fabric. Transmitted light is ideal for identifying construction problems, but reflected light (i.e., surface light) is the method that should be used for grading fabric, because that is how the customer will see it. Transmitted light should be used when a problem needs to be identified, but reflected light should be used all the time.

The fabric shearing and brushing machine was inoperable. Furthermore, it would be unwise to use such a machine until the problems concerning the cut-off selvedges on the cloth produced on the Saurer Diederich looms have been solved. A cut-off selvedge that has not been removed will damage this machine.

Major fabric faults observed were the following:

- Selvedges were often tighter than the body, which creates creases in the fabric and causes finishing problems.

- Bad weft faults included start marks, missing picks, etc., which occurred predominantly at shift changes. This indicates that looms were not started correctly or were stopped unnecessarily.

- There were weft bars in fabrics woven on the Utas looms. To prevent these, a better system of pirn distribution needs to be adopted to ensure that pirns are not mixed.

- Double picks were not found correctly by the operators.

- There was sloughing off in the body of the fabrics caused by inadequate tension control within the shuttle. The appropriate fur or pile fabric tension control in the shuttle should be consistently maintained.

- The presence of “oily fly” in woven fabrics is due to the careless use of compressed air to blow fly from the machines. The fly settles on adjacent machines and is easily woven in. Vacuum extraction cleaning should be used for removing loose fly.

- Warp bands are probably caused by mixing batches of differing yarns. (See the earlier discussion about the yarn storage and handling system.)

- The presence of loose threads in woven fabrics is caused by the loom operators' carelessness. They leave loose threads lying on the warp sheet at the back of the loom.

- Cut off selvedges had not been removed even when selvedge cutters were fitted to the machines. Selvedge cutters were observed to be inoperative for many meters at a time.

After inspection, cloth is generally folded and placed on pallets for transport to the finishing department.

D. Fabric Dyeing and Finishing Operations

Both fabrics and yarns are dyed at this facility; the fabric section is covered here first. Exhibit H-8 presents a flow chart showing typical dyeing and finishing steps for drill and poplin fabrics. A limited amount of printing is also done here. The process used to print sheeting material is illustrated in Exhibit H-9.

The cleanliness and orderliness of this department are better than that seen in others in Ethiopia. Maintenance also compared favorably but needed improvement in some areas.

D1. Singeing and Wetting

This is a continuous operation; the fabric is first brushed to raise any protruding fibers, then singed on both sides by flames. The air-to-fuel mix is well adjusted, with good control of the flame height. The fabric passes out of the singeing chamber and into a wetting box containing a wetting agent, then is batched onto an A-frame.

The singer has no spreading device to keep the fabric flat when going through the singer. This greatly increases the risk of the fabric being creased, but this was not observed during the visits.

Exhibit H-8. Process Flow Chart for Finishing of Drill and Poplin Fabric at the Kombolcha Textile Factory

Singe
↓
Scour
↓
Bleach
↓
Wash
↓
Cylinder dry
↓
Dye
↓
Wash
↓
Stentor dry
↓
Pad finish and stenter dry
↓
Shrink proof
↓
Inspect
↓
Folding or rolling
↓
Baling

D2. Washing and Caustic Scour Saturator

The fabric goes through a series of four wash boxes containing hot water to remove the size from the fabric. All of the standard woven fabrics are sized with a water soluble starch. Since no enzyme is used, only a hot wash is required. The fabric then enters a fifth and final box containing a caustic scour solution. After the fabric has been saturated with the scouring solution it is batched onto an A-frame.

Between each of the boxes is a spreading device and squeeze rollers. The fabric spreaders and squeeze rollers are in poor condition, causing creases in the fabrics.

Exhibit J-9. Process Flow Chart for Finishing of Printed Sheets at the Kombolcha Textile Factory

Singe
↓
Scour
↓
Bleach
↓
Wash
↓
Stenter dry
↓
Print
↓
Baking
↓
Pad finish and stenter dry
↓
Inspect
↓
Rolled

D3. Cabinet Steamers

To complete the reaction process of the scouring, the fabric is placed into a steam cabinet. In it, the fabric is rotated as steam is injected into the closed cabinet. The temperature inside the cabinet is approximately 90°C. The time for the reaction is from 1 to 1 ½ hours, depending upon the fabric weight.

The condition of the steaming cabinets was acceptable. There were some notable steam leaks, but they did not seriously impair control of the steam treatment.

D4. Bleaching Solution Saturator

After scouring, this unit may be used to saturate the fabric with the bleaching solution. After squeezing out the excess solution, the fabric is batched onto an A-frame. Then it is placed in a cabinet steamer at 90°C and rotated for four hours.

The bleaching solution contains hydrogen peroxide, caustic, and an organic stabilizer. The concentration of the bleaching solution is established for either a half bleach or a full bleach. No problems were observed with the bleaching solution saturator equipment.

D5. Washing Range

Washing is done in a series of eight wash boxes with fabric spreaders and squeeze rolls between the wash boxes. The fabric coming out of the washer is batched onto an A-frame.

This equipment is in good condition. It was observed that the fabric came out with creases in it, but this problem could be eliminated by adjusting the spreaders.

D6. Cylinder Dryers

There are three cylinder or can dryers. One contains 8 cylinders and the other two contain 16 each. The condition of the cylinder dryers is only fair. There is no fabric spreading device on the entrance to the dryers, resulting in occasional creases in the dried fabric.

D7. Mercerizing

The hot mercerizing system is used here, as at all other plants in Ethiopia. The temperature of the caustic solution is 50°C. Before mercerizing, the caustic solution is checked for temperature and concentration. The impregnation time is 48 seconds.

The entrance to the mercerizer has a spreading and tension device to ensure the fabric is spread and proper tension is maintained. The mercerizer is a chainless type. It contains two saturator boxes, a stabilizing unit, and five wash boxes to neutralize the caustic in the fabric. It is batched onto an A-frame before drying on the cylinder dryer.

The squeeze rolls between each of the boxes are in poor condition; they should be recovered to assure uniform squeezing. This would ensure better results in fabric dyeing.

At the present time, all of the waste water from the mercerizer goes down the drain; however, a caustic recovery unit was being installed. Management expects to put it into operation soon. This will enable substantial savings in the cost of caustic and well greatly reduce the pH of the effluent.

D8. Dyeing

Continuous dyeing is used here. Types of dyes used include reactive, vat, and sulfur. Also, some soluble vat dyes are used for pastel shades on sheeting fabrics.

Reactive dyes are padded onto the fabric and then dried. The temperature in the dryer is targeted at 140°C, using steam as the heating medium. At Kombolcha's altitude, however, it is likely that the actual temperature is closer to 110°C. The condition of the pad and squeeze rollers are such that they should be either reground or, in some instances, recovered.

After padding, the fabric is baked (cured) in a separate oven heated with thermo-oil to a target temperature range of 150°C to 180°C. The curing oven is relatively new; it is also used to cure fabrics printed with pigment colors.

D9. Chemical Pad-Steam-Wash Range

After curing, the reactive dyes are then washed through the continuous wash boxes of this machine and batched in preparation for drying. The chemical pad and steamer portion are by-passed when washing reactive dyed fabrics. Vat and sulfur-dyed fabrics are passed through the chemical pad of this unit, using chemicals appropriate for reducing these dyes to a soluble state. Steaming enables the dye to react with the cotton. Oxidization is accomplished in the first two wash boxes, followed by a cold wash, then by soaping and rinsing in subsequent wash boxes.

The squeeze rollers on the pad and between the wash boxes and the steamer section were in poor condition.

D10. Tenter Frames

There are two tenter (stenter) frames for drying the fabric. Pin-clip chains are used to keep the fabric spread. The feeding devices were in fair condition and appeared to do an adequate job of controlling the length and width of the finished fabric. Pads and squeeze rollers are available for use in applying finishes at the entrances to the tenter frames.

These tenter frames are in generally fair condition, but the condition of the squeeze rollers is poor. It is noteworthy that the tenter frame near the outside wall of the plant operates at a higher efficiency than the one in the middle. This indicates that the fresh air flow is inadequate for the one in the middle of the plant. It may be necessary to construct ducts for bringing outside air to this unit.

D11. Shrinkage Control

Although this unit is referred to as a "Sanforizer," it does not chemically treat fabric as the branded equipment would. Shrinkage control is maintained mechanically by a three-stage mechanical arrangement that has an effect on the width as well as the length of the fabric. The unit is in satisfactory condition.

D12. Finished Fabric Inspection

All fabrics are inspected in a single location. Defective fabric is cut out for eventual sale to the highest bidder, measured and rolled or folded, and the defects are recorded for the quality control department. However, as has been the case throughout Ethiopia, there is no feedback and response system in place.

D13. Terry Towel Processing

As the terry towel fabric is received from weaving, it is batched onto A-frames, then entered into jigs for scouring and bleaching. The condition of the jigs is only fair.

The majority of terry towel fabric contains dyed yarn and is scoured or scoured and bleached, depending on the style and end use. Some terry towel fabric is plain woven and is scoured, bleached, and dyed into solid colors (usually in pastel colors using soluble vat dyes). The terry cloth fabric is then passed through squeeze rollers in front of the tenter frames, dried, and inspected before rolling.

D14. Printing

The printing equipment is used primarily for towels and home furnishing textiles. Printing is done on a rotary screen printer with the capacity to print up to six pigment colors. A separate, electrically heated curing oven is used to cure the pigment print. The fabrics are then padded with the required finish and dried in the stentor, calendared, and inspected.

The printing machine and curing oven are in good condition, and the quality of the products appeared good during the team's visit. The main problem with the printing machine is its limitation to six separate colors; this constrains its ability to make products for diverse end uses.

D15. Calendar

There is one calendar machine. It is the three-bowl type and is used on printed fabrics to reduce the harsh feel caused by pigment printing. The unit is only in fair condition, and the squeeze rollers are due for maintenance.

E. Yarn Dyeing and Finishing Operations

The yarn dyeing at Kombolcha consists entirely of cone dyeing. It is mostly for all-cotton yarns, which are used primarily in the production of terry cloth towel fabrics. The typical processing steps are shown in Exhibit H-10.

Exhibit H-10. Process Flow Chart for Cone Dyeing of Yarns at the Kombolcha Textile Factory

Cone winding
↓
Load on carrier
↓
Scour and bleach
↓
Dye
↓
Dry
↓
Unload carrier
↓
Dyed yarn to storage

There are three Ilma cone dye machines, each having a capacity of 280 kg, and one dryer for drying the cones. One Ilma machine is used for scouring and bleaching the yarn, a second for dyeing the cones, and a third for dyeing beams. The third machine is not presently used. (Currently, this section has a two-shift working day, with a maximum of 560 kg dyed per day.)

Perforated plastic cones are currently reused about six times before being replaced by new ones. A better alternative may be to use stainless steel cones, which last for many years. Another possibility is to use perforated stainless steel dye tubes; after winding, the packages may be shaped to ensure good penetration of the dye liquor. If tubes are used, stainless steel separators should be used between each one.

Management raised a concern about streaks occurring on the top of the cones and inadequate dye penetration along their top edges. Uneven coloring is evident on the woven terry cloth towels. Possible causes include:

- The use of plate-type separators between the cones on the dye carrier may contribute to unequal flows. This can be alleviated by using individual, custom-fitted separators between the cones.

- Variable densities of the yarn packages have to be controlled at the cone winders.

Only one drier serves this section, but it does not function efficiently. As a result, only two lots of dyed yarn per day can be adequately dried. This would become a serious limitation if the yarn dyeing section were to start running nearer to capacity.

F. Auxiliary Items

F1. Buildings

The construction of walls and roofs is better than average in Ethiopia, and the layout of the plant is adequate. It was noted, however, that the floor was far from level in many spots. It appeared that the floor may have actually settled in spots, causing some of the machinery and equipment to be unlevel. It has since been learned that the concrete floor was poured in a hurry, without proper bedding and tamping of the foundation to install machinery that was in storage. Also, the machinery was installed in many areas of the plant before the concrete had adequate time to cure.

F2. Water Supply and Treatment

Water is pumped from eight deep wells through sand filters. The pumps run on alternate cycles. Some of the water is chlorinated and stored in a holding tank for use as drinking water. The rest of the water is softened, using a zeolite type of softening treatment, to approximately 2 ppm hardness, and is stored in a separate holding tank. After the softened water is used to feed the boiler, it is mixed with the untreated water from the wells and stored in yet another tank. This mixed water, which has a hardness of about 70 ppm, is used in the finishing department for the wet processing of fabrics and yarn.

Unfortunately, the hardness of the wet processing water should be no more than 50 ppm; therefore, the ratio of soft to hard water needs to be increased. Also, a system for heating the processing water that is sent to the finishing plant would substantially reduce the amount of steam required to adequately heat the water used in the various wet processes. In addition, if the hot water drained from the plant were sent through heat exchangers, fresh water could be heated for use in processing and waste water could be cooled to a more suitable temperature for discharge.

At present all waste water from the finishing plant is drained into the river. Using an electronic thermometer and pH meter, it was determined that the waste water had a temperature of 55°C and a pH of 10.5. The high pH is almost certainly due to the waste water from the mercerizing range draining directly into the effluent; this should be alleviated when a new caustic recovery system becomes operational.

Yet another benefit of the caustic recovery system will be to make possible the efficient operation of the effluent treatment plant, which is currently not in operation because the high alkalinity of the waste water destroyed the bacteria. An adequate caustic recovery system should reduce the alkalinity enough to allow the bacteria to live and act upon the effluent.

F3. Boilers

It was noted that one of the four existing boilers was destroyed by an explosion four years ago. The physical evidence suggests that it resulted from either sabotage or an external explosive charge; if so, there is no need to be concerned that the other boilers are in danger of exploding. Nevertheless, it would be prudent to have an ultrasonic NDT of the boiler welds.

The capacity of the remaining three boilers (6,500 kg/hr each or 19,500 kg/hr total) should be sufficient for a plant of this size. However, there is reason for concern that sufficient condensate is not being returned, thereby making the plant less efficient. No reliable estimate or figures of condensate return were available.

Water treatment for the boilers needs attention. While the water is treated to remove solids and other contaminants and to soften it, the water fed into the boiler plant is not treated on a continuous basis. A dose of chemicals every two days is not enough; appropriate boiler treatment chemicals should be continuously injected into the water line going to the boilers. This is necessary to prevent build up of scale, pipe corrosion, and "carry over." Proper treatment of boiler water can also affect dyeing in the finishing operations where open steam boiling is used.

F4. Air Compressors

This factory has 16 air compressors with storage tanks. There are two central locations for compressed air, with distribution from the storage tanks by pipelines to the various production areas. The air pressure is controlled by regulators at each of the production machines, so that proper pressures are maintained for the individual processes.

The installation in the finishing department consists of five dual piston compressors together with their receivers, which are connected together in tandem. The location of this installation in the center of the department is a mistake. Because the area is very hot with no outside air intake, it is inefficient. Also, the installation is dangerous, because (1) there are no isolating valves after each compressor, but only one solenoid valve; and (2) the main air line slopes in the wrong direction, so that condensate and compressed air flow in opposite directions, and (3) pipes rub on other metal parts, which can cause pipe failure. It is also apparent that the compressor units have had many repairs, and some are now delivering compressed air that is contaminated with oil. From a technical standpoint, this installation should be replaced with a single rotary compressor similar to the new CompAir Broomwade installation in Kombolcha's weaving room, with the installation including new fresh air intake ducts. (Perhaps the existing units could be used as a source of parts to maintain the old installation in weaving a little longer.)

Another installation near the spinning section contains three older rotary screw compressors that run very hot. Although they were positioned next to an outside wall and structured with a fresh air supply, the ventilators in the wall were almost completely blocked. The fine mesh wire in the ventilator should be replaced with a coarser mesh that is less susceptible to blockage. Similarly, the exhaust vents near the ceiling were also blocked and the wire mesh in need of replacement.

F5. Environmental Control

Readings taken with an electronic hygrometer revealed that only the warping room and weaving room number two were adequately humidified (Exhibit H-11). In the yarn storage room, several ducts were covered by cardboard, resulting in the humidified air being passed out through the exhaust nearest to the input duct. Also, many outside doors were left open, resulting in humidity levels very close to those outside. The situation was particularly bad at the far side of the main weaving room.

Recording thermohygrographs are installed close to the humidity controllers in several departments. Our readings confirmed that these recording thermohygrographs generally performed correctly. However, the humidity in the areas where the controllers were located was often higher than in other areas of the same room. The fact that the controllers were generally situated in the middle of a room corroborates the conclusion that the open doors adversely affect humidity levels. Even so, the humidity levels targeted are too low in several areas. The recommended levels for the temperatures encountered are shown in Exhibit H-11.

Exhibit H-11. Summary of Temperature and Relative Humidity Measurements at the Kombolcha Textile Factory, April 25, 1996

Location	Temperature	Relative Humidity	Ideal Relative Humidity
Outside	27°C	34%	NA
Opening	29°C	31%	50 - 55%
Carding	31°C	34%	48 - 50%
Drawing	32°C	33%	50 - 52%
Rovin	31°C	36%	48 - 49%
Spinning	32°C	35%	42 - 45%
Cone Winding	28°C	42%	55 - 60%
Yarn Store	28°C	48%	55+%
Warping	30°C	56%	55 - 60%
Sizing	30°C	45%	--[1]
Weaving Main	28°C	50%	60 - 65%
Weaving Rm 2	28°C	67%	60 - 65%
Weaving Rm 3	27°C	50%	60 - 65%

[1]There is no air conditioning capability here.

Inspection of the humidification plant revealed a build-up of particles on the filter screens in the weaving humidification plant. Not only should these be cleaned with the correct detergent, but the area around the sprays should be treated with bleach or disinfectant to kill bacteria.

Several atomizer head racks had been blocked off to avoid too much humidification when the plant is not operating at full mechanical capacity. This is a reasonable action to take, but it is important to unblock appropriate units whenever equipment is placed in service.

The people at Kombolcha should make trial-and-error observations to reset room fan speeds to gain a slightly more rapid exchange of conditioned air in the various departments.

F6. Electrical

During the team's two visits to Kombolcha, there was an area-wide "brown out" involving restricted electrical supply. While the Kombolcha plant was able to continue operating, it is obvious that there is a critical need for improved electrical generation and delivery to the area. Without it, delicate electrical equipment such as testers, autoleveler controls, and electronic clearing and end-detection systems will be damaged and disabled. It is commendable, however, that the electrical switch gear of this operation is generally maintained well.

G. Conclusions

G1. Technical Capability for Global Competition

This factory is adequately equipped and maintained to reach the productivity and quality control levels needed to produce for world markets; however, the logistical and infrastructural limitations are quite formidable. These limitations make timely delivery of acceptable products uncertain and greatly increase the combined costs of communication, production, and delivery.

The Textima machinery associated with spinning is adequate for this enterprise to pursue any reasonable objectives. The Elitex machinery is less adequate, but it is quite feasible to continue with it for several years.

Greige fabric quality compared favorably with the older Ethiopian plants but unfavorably with internationally accepted standards. In recent years, the standards required in the international market are much higher than they used to be. In particular, the Utas looms cannot be expected to consistently produce an international level of product quality. Perhaps the made-up towels are an exception, but only because they are cut into individual towels, enabling removal of most of the problems.

G2. Management

The team was impressed with the proactive attitude of the Kombolcha managers. They were generally aware of the major problems and wanted to correct them. Several technical problems in the plant are related to a well-intentioned tendency to take guidance and suggestions too literally and a failure to bring adequate knowledge and experience to the task of running the factory. One result has been the expenditure of money on unnecessary repairs, while other, more pressing, problems are not fixed. The desire for "recipes" to use in managing a plant are understandable, but management must ultimately provide the expertise and bear the responsibility for making correct decisions.

Perhaps a workable approach is to bring in an expert to work with the general and technical managers on a systematic approach to improving the factory's operations. An expert could monitor the initiation of the system, withdraw for fixed periods, and return on an agreed schedule to review progress, consult, and plan with management, making adjustments as deemed necessary to achieve goals. This process would take two to three years.

G3. Training

Although UCO introduced AMPS training systems to Kombolcha a few years ago, there was little evidence that the substance of those training programs had been applied. Thus, while weavers' knots were usually tied correctly, there was no evidence of the patrolling needed for good control of the machinery. The one training manual visible on the book shelves looked as if it had never been used. As with other factories, meaningful implementation of the excellent techniques provided by training programs was absent. This phenomenon is another reason for the proposal above. Follow-through is necessary if they are to benefit from sound advice.

G4. Maintenance

It was encouraging to see at Kombolcha significant maintenance efforts and attention to problems. However, the aforementioned need for experienced judgement in setting priorities still applies. For example, it was somewhat distressing to observe how much effort was expended on restoring the Utas looms and how little effort was made to restore the Saurer Diederich looms. The Utas looms, even configured as automatic machines, are not able to weave fabric to internationally acceptable standards. The Saurer Diederich looms, if fitted with replacement clutches and with some minor upgrades such as selvedge cutters, would be able to produce far better cloth.

G5. Quality Control

Kombolcha has an adequate laboratory for testing fibers and yarns, along with a reasonable program for monitoring these. Unfortunately, two of the main instruments in the laboratory are currently not operational; namely, the model 530 Fibrograph and the Uster II. The reason given was lack of replacement parts and instructional manuals.

A new potentiometer for the Fibrograph was obtained and given to the factory. When installed by the plant's electrician, it was determined that some of the photocells were defective. Their proper installation was reviewed with the plant's electrician. The intent is to forward these to the plant after the team returns to the United States.

The Uster tester has a broken switch; this will also be forwarded to the plant. An instrument that measures yarn evenness will be much needed on a daily basis if export quality is the objective.

The plant uses a Tonnison (taper board) winder to check spinning performance. This is a very good way to judge yarn appearance and locate defective top and bottom rolls. Normal size checks of the spinning, roving, drawing, and cards were observed; they appear to be quite adequate.

As with other factories producing greige fabrics in Ethiopia, only transmitted light was used to detect faults in the fabrics. This needs to be combined with inspection under reflected light. A useful grouping of the types of detected faults needs to be developed. The resulting information should be made part of a consistent feedback system to the weaving and spinning operations. Otherwise, the faults recorded are only an *ex post* record, rather than a tool for preventing faults in the future.

The dyeing and finishing laboratory can perform wash-fastness, crocking, and absorbency tests on bleached fabrics. There is no equipment for light-fastness testing or for shrinkage testing on fabrics.

There is a laboratory package dyeing machine appropriate for developing new color formulas and procedures for the cone dyeing operation, as well as a hand-operated pad for developing new colors for pad dyeing. It should be emphasized, however, that the squeeze rollers on the laboratory pad dyer need to be repaired. With these rollers, color formulas would probably not be reproducible in actual production.

G5. Technical Recommendations

G5a. General

- An effective training program for management and operators should be developed and executed. Without this, equipment improvements and procedural changes will not yield the gains in efficiency sought.

- Focus efforts on developing more efficient cleaning, inspection, and maintenance programs for machinery and equipment.

- Optimize machine settings and processing parameters for the yarns and fabrics produced.

- Set air conditioning controls to maintain proper balance between dew point and relative humidity settings.

G5b. Spinning Operations

- Set priorities on which cards to reclothe based on an examination of the wire and its actual condition, rather than on a rigid schedule. Continue to conduct inspections of the cards on a set schedule.

- Keep the flats of the card clean at all times. This inexpensive practice does not involve taking the card out of production, yet it can greatly improve quality, reduce the number of ends down in spinning, and reduce the number of loom stops. It also increases the useful life of the clothing of the flats and the cylinder wire.

- Validate the need for the various cleaners in the opening line now being used. Some can probably be eliminated without unacceptable loss of cleaning but will achieve reductions in the creation of neps.

- Put the autoleveling systems on the cards in good repair and keep them working. This is important for controlling variations in evenness throughout all other spinning operations.

- Examine and adjust the roll spacing of all the draw frames. Both fiber checks and variation charts indicate that these are not optimum, especially for the finisher drawing.

- Establish a realistic cleaning schedule for the spinning frames. This will include separate schedules for basic cleaning (scouring), lining and leveling of the frames, servicing and plumbing of the spindles, and thread guides.

- Eliminate the practice of storing yarns for a week between spinning and weaving operations. This will reduce the risk of mixing different yarns, without hurting any other aspect of the manufacturing process.

- Establish a schedule for cleaning the vacuum tubes of the winders. This can be executed while the winder is in production by servicing individual units one at time.

- Establish a program to monitor and correct problems in spindle speed variation on two-for-one twisters. A stroboscope is needed to do this well.

- Hasten to repair the Uster II and the Fibrograph and use them systematically.

G5c. Weaving Operations

- Focus on the proper alignment and adjustment of the warping machines. The team's two visits provide an object lesson in the difference between attention and inattention to detail.

- Seek ways to use the sizing machines to simply warp beams for the weaving looms. If it is necessary to do much of this, consider combining the warp beams behind a headstock.

- Give immediate attention to multiple problems in the sizing area; solutions here will alleviate many subsequent problems. Particular attention should be given to stopping the over-drying that occurs here.

- Keep the electrical control panels closed in the beam storage area; this was the only problem noted in an otherwise well maintained area.

- Take greater care when mounting beams onto heald frames and onto the Saurer Diederich looms.

- Focus on repairing and refurbishing the Saurer Diederich looms, unless it is concluded for market-related reasons that they are not needed. The Utas looms will always be technically marginal, while the Saurer Diederich looms can be made to produce acceptable fabrics of several constructions.

- Assess the type of inspection that is most appropriate for specific fabrics and act accordingly.

- Integrate fabric inspection operation into a timely quality monitoring program that results in fewer fabric faults in the future.

G5d. Dyeing and Finishing Operations

- Establish a program of regular cleaning and maintenance and insist on carrying it out; reinforce it with an aggressive training program. Cleanliness and orderliness present many distinct challenges in the wet processing operations, but they are critical.

- Establish a program of inspection and maintenance of the squeeze rolls throughout the department. These are a major source of non-uniform application of dye stuffs and finishes.

- Establish an ongoing training system for supervisory personnel aimed at increasing their knowledge of technical aspects of dyeing and finishing. They must give leadership to the maintenance supervisors on caring properly for this sensitive and complex machinery.

- Carefully consider the purchase of stainless steel dye tubes and/or cones, along with appropriately sized separators for them in the cone dyeing units. It seems likely that this will alleviate some of the current problems seen in dyed packages.

- Set the winder tensions to achieve uniform density and size of the cones dyed. This will likely alleviate the rest of the current problems seen in dyed packages.

- Work to establish a reconditioning and maintenance plan for the dyeing and finishing machinery. Even though the department is made up predominantly of Textima equipment, there are parts available in Europe and the United Kingdom.

- Adjust and repair where necessary the guide and spreader rolls on all equipment; this will alleviate the creasing of fabrics during dyeing and finishing.

- Assess the feasibility of installing a steam or hot water recovery system, reclaiming hot water from the finishing plant for use in the washing operations. Total efficiency of the boiler operation could be improved enough to reduce costs within a year or two and repay the investment. (Of course, the plant must be operating at a high percent of capacity to realize a short payback period.)

- Establish and monitor a reporting system for corrective action taken on quality problems reported by finished fabric inspectors. Unless corrective action is the result of the reporting system, it is an added expense rather than a means of reducing production costs.

- Assess equipment needs for the color laboratory, especially the need for a light-fastness tester and a fabric shrinkage tester; add them if needed, and train operators in their efficient use. Put color developing and color matching equipment in good repair, and train operators to use them effectively. Timely development and control of new and existing dye formulas/recipes will be necessary to serve most export markets, as will the ability to do exact color matching on demand.

ANNEX I

TECHNICAL EVALUATION OF AWASA TEXTILE FACTORY

PREVIOUS PAGE BLANK

ANNEX I
TECHNICAL EVALUATION OF AWASA TEXTILE FACTORY

A. Introduction

The technical team visited the Awasa Textile Factory March 11-13, 1996, to conduct a comprehensive technical assessment of the plant. Because the plant manager was out of town during this time, Ato Sherafaraw Girma accompanied and hosted the team.

This plant has been operational for approximately six years. It is well located on a site near the town of Awasa and is well laid out as an integrated textile manufacturing facility. All manufacturing functions, from opening through dyeing and finishing, are housed under a single roof, which enables an efficient flow of goods-in-process through the plant. The basic design and engineering—everything from the electrical service to machinery placement—is superior to anything else in Ethiopia at this time. Much of the plant can be served by humidified air conditioning equipment.

The Awasa Textile Factory is at a critical age, with the majority of depreciation now behind it, and requires heightened attention to maintenance and repairs to remain a viable, competitive factory. The technical team's evaluation of this plant was done with a view toward necessary adjustments to enable the factory to achieve success in the years ahead.

B. Spinning Operations

The spinning operations are dominated by Marzoli equipment of 1987 vintage; they are designed around 44 Marzoli ring spinning frames with a total of 24,288 spindles. The factory also has machinery for lap forming and combing, doubling, and twisting.

Using an electronic hygrometer, a series of four readings on temperature and relative humidity were taken throughout the spinning areas during the morning of March 13, 1996. This was a clear day with an outside temperature that went from 26.4° Celsius at 9:00 a.m. to 31.0° at 12:00 noon, with the outside relative humidity going from 43 to 32 percent during the same time. Corresponding measurements were taken in the opening room, the drawing area, and the spinning area. These are summarized in Exhibit I-10. Textile machinery was idling at 12:00 noon because all production workers leave for lunch at the same time. The temperature and relative humidity changes indicate that the system needs some adjustment and resetting to provide better control of conditions. Because the system does not use chilled water for the air washers, temperature control is not possible. However, the system could provide adequate conditions for processing cotton by using both dew point and relative humidity control settings balanced at the control station of the system. Of course, the temperature will have to vary considerably with this arrangement.

B1. Opening Line

This plant is equipped with a Marzoli automatic bale opener, a rarity in Ethiopia. The bale opener has a pivoting head that is turned from one side of the guide rail to the other to feed fibers into the dual distribution system. Past use of the system also involved feeding polyester by setting up polyester bales on one side of the guide rail and cotton on the other. While it is possible to feed this way, this is not within the design parameters for this equipment. The purpose of the pivotal head system of the bale opener is to permit opening of new bales on one side while feeding from the other. This allows freshly opened bales some time to "bloom" (i.e., to fluff up and stabilize after the bale ties are removed). This ensures a more consistent feed volume and a better bale-to-bale blend of the stock being fed.

Exhibit I-1. Temperature and Humidity Readings Taken on March 13, 1996 at the Awasa Textile Factory

Locations	Reading Times							
	9:00 AM		10:00 AM		11:00 AM		12:00 Noon[1]	
	°C	%	°C	%	°C	%	°C	%
Outside (near cotton warehouse door)	26.4	43	27.4	44	30.5	30	31.0	32
Opening (by room hygrometer)	28.2	43	29.8	44	33.5	35	32.5	36
Drawing (between frames #4 & #5)	29.7	41	31.0	43	33.2	37	32.6	38
Spinning								
In middle between frames #9 & #10	30.0	42	30.4	47	32.0	43	31.5	43
In middle between frames #31 & #32	30.6	43	30.5	48	31.8	44	31.5	45
North end between frames #20 & #21	32.3	37	32.9	43	32.4	42	31.5	43
South end between frames #20 & #21	32.8	35	31.7	44	31.7	42	31.5	40

[1] Machinery was idling at this time.

The opening equipment is in pretty good condition; with somewhat more maintenance it could be in excellent condition. This equipment is more robust and less temperamental than most textile machinery. Aside from scheduled cleaning and lubrication, relatively minor adjustments and a little maintenance would keep it in top condition.

B2. Carding

There are 14 carding machines. The basic card settings observed are summarized in Exhibit I-2. Holes in the selvages of the carding webs indicated evidence of damage to the under-cylinder screens of carding machines. This is most likely to have occurred because the screens were inadequately protected from touching the wire of the card cylinder when removed or replaced. Scratches on the screens cause chokes to build up, resulting in holes such as the ones observed on these carding webs. Another possible cause of this problem is inadequate cleaning of the screens; however, the cleaning schedule and an inspection of some screens do not indicate this to be the case at Awasa.

Exhibit I-2. Basic Card Settings at the Awasa Textile Factory

Location	Setting
Feed Plate to Licker-in	.020 in
Mote Bars to Licker-in	.012 - .014 in
Licker-in to Cylinder	.007 in
Back Plate to Cylinder	
Top	.024 on
Bottom	.024 in
Flats to Cylinder	
1st Stand	.012 in
2nd Stand	.010 in
3rd Stand	.010 in
4th Stand	.012 in
Screen to Cylinder:	
Front	.022 in
Center	.050 in
Back	.100 in
Front Plate to Cylinder	
Top	.034 in
Bottom	.022 in
Cylinder to Doffer	.003 - .004 in

For the type of carding machines in this plant, the screen settings are not optimum for the stock and production rates used. This could contribute to the problem of chokes in the cards. However, recommended settings for the screen are not possible without a closer analysis of this plant's situation.

On one carding machine, the wire on the cylinder had been damaged; therefore, the machine was off-line due to rewinding of the unit and other repairs. The rewinding was complete as of our visit; we were able to observe that the card had been re-clothed with approximately 70 percent old wire and the remainder new wire. This necessitated excessive grinding of the new wire and provides an example of the kind of cost cutting that will damage the technical performance of a textile mill. This entire repair should have been made with new wire.

Due to the observed poor performance of the vacuum system that removes waste and dust from the carding machines, the system was inspected by the team in cooperation with the plant's technical personnel. The control of the sheeting of the condenser removing this waste was set incorrectly, causing it to make a mat that was too light to ensure that it would be continuously stripped away. Therefore, the mat rolled up sporadically and obstructed the vacuum applied to the cards.

Finally, the flats of the cards were allowed to accumulate too much dirt and trash. This may cause contamination of the sliver, resulting in more ends down in spinning and weaving.

B3. Lap Forming and Combing

At the time of our visit, this part of the system was not operating because the combers are used only to comb cotton for blending with polyester.

Ten combing machines are served by one lap forming machine. An inspection of the idle equipment indicated it was operational and could be put into service without excessive work or spare parts. However, the top combs showed enough wear and damage to warrant attention if the combing machines were activated. Also, the needles of the half-laps on the machines indicate that the brushes should be adjusted.

B4. Drawing

The drawing machines are of high quality and are in generally good-to-excellent condition. With proper maintenance, they can remain capable of good quality output for several more years.

Although these machines are equipped with electronic draft control (or autoleveller), they were unfortunately operated with the control device disabled. We were told that this equipment had been electrically damaged and not replaced. This illustrates the serious problems caused to a modern textile mill by unreliable electrical supply systems. An economical solution should be found to the susceptibility of the drawing autoleveller system to damage from electrical problems. Such systems have become a necessity for consistently high quality in drawing, especially in the context of global competition. The accessory was desirable when the Awasa Textile Factory was first built, but it has quickly become the only acceptable method of drawing cotton and other staple fibers. Since drawing offers the final, critical place in the spinning process to blend fibers and to level the unit weight of the untwisted fibers, it is extremely important in producing strong, even yarns.

B5. Rovin

This is a trouble spot in the Awasa Textile Factory. It is scheduled for thorough servicing only once a year, but nine months should be the maximum. To make matters worse, inspection revealed that aprons on the frame had probably not been replaced in over two years. Both aprons and top roll coverings are routine replacement items; in this plant, they should all be inspected about every nine months and replaced as necessary. The following was observed:

- Approximately 30 percent of the bottom aprons were missing from the rovin machines. Continuing to run with missing aprons will cause increased unevenness and lower breaking strength in the spun yarns.

- On average, about 20 tension arms were broken per rovin frame; if the tension arm is broken, the apron is useless. This problem should disappear with proper apron fitting and proper cleaning of the apron bars.

- On average, three grommets at the top of the flyer were missing per frame. Their absence reduces control of the tension between the top of the flyer and the front roll delivery, and reduces the amount of false twist imparted to the rovin. This increases the likelihood of ends down.

- Gears for bobbin drives were missing on two of the frames.

It appeared that routine operator cleaning of the drafting system was not being performed. This will result in the incorporation of slubs into the rovin and, eventually, the yarn. In addition to creating uneven yarns, this will cause increased cuts during the winding process. The increased winding cuts entail more knots in the yarn and, of course, additional knots in the yarn mean additional loom stops.

B6. Ring Spinning

There are 44 ring spinning frames. Data on them is summarized in Exhibits I-3 through I-5. Spindle speeds were found to be within acceptable limits, highlighting one of the good aspects of this operation. It also reveals benefits provided by the tangential belt spindle drive. While this is an excellent drive system, it does require monitoring as it begins to age. Normal wear for this system was apparent; therefore, it will require closer attention than it is now getting to avoid future problems.

A current problem is that the mill has recently purchased a supply of new blue cops that are clearly defective. After analyzing these with a stroboscope, it became clear that they have substantial distortion. Plant technicians were somewhat aware of the problem; they estimated that about 10 percent of the shipment of cops were defective and that a complaint asserting this fact was registered with their supplier. According to the plant personnel, no settlement has been made at this time.

Unfortunately, no steps were taken to identify and remove the defective cops. If this had been done, it would likely have been discovered that the balance of this order was also defective. Not a single cop from this lot that was tested with the stroboscope was judged acceptable. Ato Sherafaraw was advised of the problem and observed the stroboscope tests on several cops.

These defective cops should not be used because they will soon cause permanent damage to the spindles. While the spindles could be repaired, the cost would be astronomical compared to the cost of simply installing acceptable cops now. This entire scenario illustrates the importance of proper operator training and discriminating production management.

A focused effort was also made to analyze the twist multipliers used for the yarns produced in this plant. Results indicated that all the twist multipliers are approximately the same—between 4.0 and 4.2—whether the yarn is for warp or weft and regardless of the yarn size. This cannot be close to optimum twist factors for the weaving yarns produced. For the rapier looms operated at Awasa, a certain balance between break and elongation must be reached to optimize weaving performance. Failure to do this will result in an excessive number of ends down in the weaving process.

Exhibit I-3.Basic Engineering Data on Spinning Machines at the Awasa Textile Factory, April 11, 1996

Frame No.	Manufacturer	No. of Spindles	Year Made	Year Installed	Ring Diameter	Front Roll Diameter	Spindle RPM
1	Marzoli	552	1987	1989	48 mm	27 mm	10,596
2	Marzoli	552	1987	1989	48 mm	27 mm	10,169
3	Marzoli	552	1987	1989	48 mm	27 mm	10,102
4	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
5	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
6	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
7	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
8	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
9	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
10	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
11	Marzoli	552	1987	1989	45 mm	27 mm	12,678
12	Marzoli	552	1987	1989	45 mm	27 mm	12,978
13	Marzoli	552	1987	1989	45 mm	27 mm	12,474
14	Marzoli	552	1987	1989	45 mm	27 mm	12,388
15	Marzoli	552	1987	1989	45 mm	27 mm	12,444
16	Marzoli	552	1987	1989	45 mm	27 mm	11,678
17	Marzoli	552	1987	1989	45 mm	27 mm	10,636
18	Marzoli	552	1987	1989	45 mm	27 mm	10,673
19	Marzoli	552	1987	1989	45 mm	27 mm	12,458
20	Marzoli	552	1987	1989	45 mm	27 mm	12,485
21	Marzoli	552	1987	1989	45 mm	27 mm	12,444
22	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
23	Marzoli	552	1987	1989	48 mm	27 mm	Stopped
24	Marzoli	552	1987	1989	48 mm	27 mm	10,548
25	Marzoli	552	1987	1989	48 mm	27 mm	10,555

Exhibit I-3 (Concluded). Basic Engineering Data on Spinning Machines at the Awasa Textile Factory, April 11, 1996

Frame No.	Manufacturer	No. of Spindles	Year Made	Year Installed	Ring Diameter	Front Roll Diameter	Spindle RPM
26	Marzoli	552	1987	1989	48 mm	27 mm	Stopped
27	Marzoli	552	1987	1989	45 mm	27 mm	10,535
28	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
29	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
30	Marzoli	552	1987	1989	45 mm	27 mm	10,591
31	Marzoli	552	1987	1989	45 mm	27 mm	10,653
32	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
33	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
34	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
35	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
36	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
37	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
38	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
39	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
40	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
41	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
42	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
43	Marzoli	552	1987	1989	45 mm	27 mm	Stopped
44	Marzoli	552	1987	1989	45 mm	27 mm	Stopped

Exhibit I-4. Engineering Data on Set-up of Spinning Machines at the Awasa Textile Factory, April 11, 1996

Frame No.	Manufacturer	Yarn Count	Twist Gear	Twists per Inch	Twist Multiplier	Draft Gear	Traveler No.
1	Marzoli	16/1	52	16.67	4.17	51	F2 #5
2	Marzoli	16/1	52	16.67	4.17	51	F2 #5
3	Marzoli	16/1	52	16.67	4.17	51	F2 #5
4	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
5	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
6	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
7	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
8	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
9	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
10	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
11	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
12	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
13	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
14	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
15	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
16	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
17	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
18	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
19	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
20	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
21	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
22	Marzoli	32/1	57	23.53	4.16	55	F1 #2/0
23	Marzoli	14/1	48	14.97	4.00	47	F2 #6
24	Marzoli	14/1	48	14.97	4.00	47	F2 #6
25	Marzoli	14/1	48	14.97	4.00	47	F2 #6

Exhibit I-4 (Concluded). Engineering Data on Set-up of Spinning Machines at the Awasa Textile Factory, April 11, 1996

Frame No.	Manufacturer	Yarn Count	Twist Gear	Twists per Inch	Twist Multiplier	Draft Gear	Traveler No.
26	Marzoli	14/1	48	14.97	4.00	47	F2 #6
27	Marzoli	20/1	44	18.60	4.16	51	F1 #3
28	Marzoli	20/1	44	18.60	4.16	51	F1 #3
29	Marzoli	20/1	44	18.60	4.16	51	F1 #3
30	Marzoli	20/1	44	18.60	4.16	51	F1 #3
31	Marzoli	20/1	44	18.60	4.16	51	F1 #3
32	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
33	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
34	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
35	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
36	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
37	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
38	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
39	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
40	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
41	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
42	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
43	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0
44	Marzoli	40/1	43	26.56	4.20	45	F1 #6/0

Exhibit I-5. Engineering Data on Operating Settings of Spinning Machines at the Awasa Textile Factory, April 11, 1996

Frame No.	Manufacturer	Draft	Roll Set 1-2	Roll Set 2-3	Tensor Space	Foot-in Vacuum	Head-in Vacuum
1	Marzoli	SKF	57 mm	44 mm	Black 4.3 mm	4.6	4.1
2	Marzoli	SKF	57 mm	44 mm	Black 4.3 mm	4.8	4.0
3	Marzoli	SKF	57 mm	44 mm	Black 4.3 mm	5.1	4.2
4	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
5	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
6	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
7	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
8	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
9	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
10	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	4.9	4.1
11	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	4.8	4.1
12	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	4.0	3.4
13	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	4.9	4.1
14	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Maint.	Maint.
15	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	4.7	3.8
16	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	4.8	4.2
17	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	5.0	4.0
18	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	3.4	1.5
19	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	5.1	4.0
20	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	5.0	4.3
21	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	4.8	3.8
22	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
23	Marzoli	SKF	57 mm	44 mm	Black 4.3 mm	Stopped	Stopped
24	Marzoli	SKF	57 mm	44 mm	Black 4.3 mm	Stopped	Stopped
25	Marzoli	SKF	57 mm	44 mm	Black 4.3 mm	4.7	4.1

Exhibit I-5 (Concluded). Engineering Data on Operating Settings of Spinning Machines at the Awasa Textile Factory, April 11, 1996

Frame No.	Manufacturer	Draft	Roll Set 1-2	Roll Set 2-3	Tensor Space	Foot-in Vacuum	Head-in Vacuum
26	Marzoli	SKF	57 mm	44 mm	Black 4.3 mm	Stopped	Stopped
27	Marzoli	SKF	57 mm	44 mm	Yellow 5.0 mm	4.6	4.0
28	Marzoli	SKF	57 mm	44 mm	Yellow 5.0 mm	4.2	3.6
29	Marzoli	SKF	57 mm	44 mm	Yellow 5.0 mm	4.5	3.6
30	Marzoli	SKF	57 mm	44 mm	Yellow 5.0 mm	5.0	4.0
31	Marzoli	SKF	57 mm	44 mm	Yellow 5.0 mm	4.4	3.9
32	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
33	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
34	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
35	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
36	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
37	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
38	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
39	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
40	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
41	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
42	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
43	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped
44	Marzoli	SKF	57 mm	44 mm	White 3.2 mm	Stopped	Stopped

The distinctive effects on loom stops from improper twist in the warp yarns could not be estimated because the cotton going through the system had been contaminated by jute from the bale covers, no doubt masking the effects of twist factors on the number of ends down in weaving. An inspection of opened bales at the feed line indicated that the jute fiber contamination was due to carelessness in cutting the bale wrap.

Discussions with production managers led us to the opinion that current machine settings and related production practices have been determined largely by advice and suggestions from those who originally installed the equipment in the new plant. Perhaps the twist factors used were recommended by a machine erector accustomed to spinning cotton with longer staple lengths than are used in the Awasa Textile Factory. But the responsibility for fine tuning the machinery for the raw materials used must be borne by the mill management. Besides, the variability of fiber properties appears large enough to require constant monitoring—and careful blending—to keep the yarn quality above an acceptable threshold.

The following are additional observations on spinning:

- A conclusion similar to that for the twist multipliers holds for the drafting roll settings. These spacings need to be optimized according to the fiber properties and yarn requirements.

- Likewise, it is quite likely that the tensor spacers should be optimized for the various yarn counts spun. A combination of related factors should be considered, including hank roving, break draft, roll spacing, and twist of the rovin.

- There is an obvious lack of good aprons (or any aprons at all) on the drafting units of the spindles; the situation here is comparable to that for the rovin. It causes unevenness and lower breaking strength in the spun yarn and in the finished fabric. To solve this problem, accurate maintenance records should be kept for company technicians to use to determine the most cost-effective replacement cycle.

- The output nozzles of the overhead cleaners have not been configured correctly to keep the creels of the frames cleaned. Resulting excess lint hanging from the creel hanger brackets is sporadically shedding into the drafting system, causing ends down and putting unwanted slubs into the yarn.

- There is no doubt that proper maintenance and an emphasis on cleaning and lubrication would greatly reduce the observed wear of the gears on the spinning frames. This machinery is old enough to make such actions more urgent to ensure the future performance of the ring spinning.

B7. Winding

It appears that the winding operation needs special attention. During our visit, on average more than 4 of each 12 spindle sections were not operating, as indicated by the illuminated red lights. Main causes appear to be about equally divided between (1) operators not keeping new cops fed to the units so they can continue to operate, and (2) various mechanical problems, including maladjusted spindles, malfunctioning yarn splicer units, and incorrectly set tension devices. All of these mechanical problems on the winding machines will cause efficiency and quality problems in subsequent manufacturing operations.

With available tension testers it was not practical to measure the exact tension of the yarn packages on this type winding. However, manual and visual checks did reveal excessive variations. A simple and effective check of package tension variation is to compare the firmness among the full cones coming off the various spindles. This should be a standard task for the operators and technicians assigned to this equipment.

B8. Doubling

Problems in the doubling operation became apparent in the weaving room, where many doubled yarns looked like a core wrapping rather than two strands twisted equally around each other. Using our tensiometer, we observed that tensions between the ends of yarn supplied to the same take-up package varied widely; the range of our tension measurements was between 9 grams and 65 grams. Such differences will readily result in the higher tensioned yarn becoming a core or center yarn, with the lower tensioned yarn wrapping around it. Furthermore, this situation resulted in an excessive number of end breaks in the doubling operation.

Most causes of these kinds of tension variations are related to poor cleaning and maintenance. Improper cleaning of tension posts, the wrong number of weighting washers, misalignment of the supply package spindle, and improper alignment of the guide eye in relation to the tensioning devices are some of the causes noted during our inspection. Also, the variation in package density noted in the winding operation contributes to this problem.

B9. Twisting

These two-for-one twisting machines are sound; they just need standard maintenance and repairs to perform satisfactorily. In particular, the covered feed/take-up rolls are badly grooved and need replacement; these cause variations in twist (resembling the effect of a malfunctioning belt drive to the spindles). Also, the guides over which the yarn traverses are too rough and should be replaced to avoid future problems with hairy or fuzzy yarn.

C. Weaving Operations

The weaving operations of Awasa Textile Factory are laid out in an efficient manner for the flow of goods-in-process. Also, the machinery configurations are appropriate for the types of products produced.

Given that the plant has air conditioning equipment, it was surprising to see that the cone yarn storage room was not conditioned. Instead, it had direct, permanently open vents to the outside air. The yarn must begin the weaving process in a more conditioned state for trouble-free operations.

C1. Warping

On the two warping machines, it was observed that approximately half of all the creel cleaning fans had been removed. As a result, the creel was dirty and fly had accumulated in many places. The cause of the failures should have been determined and replacement fans installed.

Tension measurements revealed large fluctuations on individual threads; i.e., from 12 to 18 grams, a 50 percent increase from low to high values. The main cause was traced to the rear creel pegs being about eight centimeters out of alignment with the tension device. We observed that the creel carts had not been pushed fully into the creel; however, even when this was corrected the creel pegs were still between two and five centimetres out of alignment, primarily because the front stop was in the wrong position. Repositioning the creel carts reduced the tension fluctuations by half (i.e., to between 12 and 15 grams).

Many ends broke on the cones, causing an unacceptable number of stops. A quality control inspector was monitoring the stoppages at the time of our visit; during our observations with him, 43 percent of stoppages were caused by jute fibers, 28 percent by weak knots, 18 percent by bad winding and sluffing, and 11 percent by other causes. Apparently, the cotton fiber had been contaminated by jute fibers from the bale wrapping at the opening line—a problem that can be stopped only by taking more care when removing the wrapping.

C2. Slashing/Sizing

There are multiple problems in this department. Observations include the following:

- There is no air conditioning in this part of the mill and the doors into this department were left open. This contributed to the 41 percent humidity level, which is far too dry for good processing of yarn.

- The initial entry drag roller gearbox on the machine was broken, so no drag could be applied. It is noteworthy that this was a smaller gearbox than that fitted to the same type of sizing machine at the Arba Minch factory. The newer arrangement at Arba Minch was more robust, suggesting that the situation at Awasa may be a design fault the manufacturer corrected in subsequent models.

- The sizing machine ran slowly and made the yarns dry, yet the operator did not increase its speed.

- The size was applied at a 6.5 percent concentration, far short of the target of 12 percent, and excessive condensate was added to the size mix when it was heated up. A primary cause of these symptoms is the lack of a steam trap at the end of the steam main over the size mixing area. Since this is the point where steam from the sizing machine is taken off, there should be a sump pocket and major trap installed there to keep the condensate from waterlogging the steam main.

- The warp sheet was very unevenly distributed in the expanding comb dents, with the number of ends varying from one to six per dent. The operator made no attempt to correct the problem during the course of our visit.

- The same size mix and concentration was used for all cloths, rather than proper variations according to fabric weight and density.

- The Smit marker was not working, so the operator had no means of measuring the correct length of material to go to the weaving loom.

C3. Weaving

The weaving department contains 124 Somet SM93 rapier looms, each with a rated capacity of 400 rpm. Given their young age, these machines were in very poor condition. In spite of the relatively new building, roof leaks over at least two weaving machines caused problems with the warps. Major observations include the following:

- Virtually all the looms were loaded with inferior warp beams. The average number of redirected (or hand fed) ends was 14.6. This indicates poor beam preparation, whether in warping, sizing, or looming. We counted 29 looms (23 percent) with ends stuck together due to bad sizing practices.

- Twenty-two looms (18 percent) had excessive numbers of crossed ends behind the drop wires; this usually indicates poor dressing and looming.

- Twenty looms (16 percent) had excessive amounts of fluff deposited around the yarns by the drop wires; this indicates that insufficient size had been applied.

- Sixteen looms (13 percent) had warp yarns threaded through the wrong eye in the heddle, which is purely the result of carelessness.

- Fourteen looms (11 percent) suffered from short or wild yarns tangled in the warp sheet; this results from weavers carelessly leaving cut threads on the warp sheet after affecting a repair.

- Other troubling observations were rapier parts woven into the cloth, drop wires that were impacted with debris, warp ends with bad knots and long tails, and waste stuck to warp threads.

Observed operator errors included the following:

- The weft packages were not tied top-to-tail for continuous running and several of the second package holders were missing. It was indicated that the cone winding machines do not function correctly to put reserve tails on the yarns, which means only that the winding problem should be corrected.

- When the knotter tied on a new beam, the tying machine was operated at full speed. This is too fast for the knotter to adequately check and control performance.

- The dresser had not placed the comb close enough to the drop wires, causing crossed ends to persist in that area.

Regarding the mechanical condition of the weaving machines:

- Many guards were broken and missing.

- Many machines ran noisily.

- The pneumatic extraction for holding the weft on the right-hand side of the loom did not often work, resulting in the lashing in of weft tails.

- Damaged air hoses had been inadequately patched with paper tape.

- The temples were often worn and rings did not rotate, resulting in damaged cloth.

- There was excess play in many rapier heads.

- Rapier guides were broken and missing.

- Wiring was exposed and subject to damage.

- Heddle frame blocks were worn, resulting in clashing.

- Selvedge cutters did not work for long periods.

A quality control inspection is regularly conducted each shift in the weaving room, with notes made on each loom's problems. However, a reading of consecutive reports reveals that looms are recorded for the same faults day after day. The information is not acted on and problems are not corrected.

On the production floor, it was encouraging to see that the weaving operatives tied the correct type of weavers knot to the correct standards in all instances observed. However, they needed to patrol their looms much more, rather than moving only if a machine light indicated a need for attention.

C4. Greige Fabric Inspection and Folding

There are inspection machines in this department, but no more than two were in operation during our visit. It was distressing that the dust covers on the electrical panels were removed from all inspection machines, allowing dust and fluff to enter. This will cause their condition to deteriorate quickly.

Very little cloth was inspected during our visit, yet there were 134 rolls of cloth waiting for inspection. Inspection should be done as soon as possible (immediately in well-managed textile mills) after the cloth roller has left the loom. Only then can problems be minimized and acted upon in a timely manner.

Also distressing was the fact that the fabric inspectors examined the cloth over an illuminated panel. This method is appropriate for determining faults related to cloth density, etc. But the customer of the fabric is more concerned about the surface appearance of the cloth, so transmitted light inspection will miss many faults seen by the customer. Inspection by reflected light on the surface is the preferred method.

Finally, in the process of correcting problems in the fabrics, operators were in several instances so rough that they damaged the cloth in other ways. They need to operate more carefully.

D. Dyeing and Finishing Operations

Awasa Textile Factory has the newest and the largest fabric dyeing and finishing facility in Ethiopia. It was designed to handle twills, poplins, and sheetings (made from cotton or from cotton/polyester blends) that were planned for production at the Awasa and the Arba Minch textile factories. Awasa has machinery and equipment for singeing and wetting, scouring and bleaching, mercerizing, dyeing, printing, drying, shrinkage control, and finished fabric inspection. These will be discussed below, after considering the boilers and water supply and treatment. Typical processing steps for dyed fabric are shown in Exhibit I-6. A similar flow chart for printed fabric is given in Exhibit I-7.

Exhibit I-6. Process Flow Chart for Dyed Fabrics at the Awasa Textile Factory

SINGEING AND WETTING
↓
SCOURING AND BLEACHING
↓
DRYING
↓
MERCERIZING
↓
DRYING
↓
DYEING
↓
TENTER FRAME
↓
SHRINK PROOFING
↓
INSPECTION
↓
DOUBLING AND ROLLING
↓
LABELING
↓
PACKING

Exhibit I-7. Process Flow Chart for Printed Fabrics at the Awasa Textile Factory

SINGEING AND WETTING
↓
SCOURING AND BLEACHING
↓
DRYING
↓
TENTER FRAME
↓
PRINTING
↓
INSPECTION
↓
DOUBLING AND ROLLING
↓
LABELING
↓
PACKING

D1. Water Supply and Treatment

The water supply for wet processing comes from eight wells, with only four at a time required to operate the facility. Information on the depth of these wells was not available during the visit; however, the concentration of silicates in the water indicates that they probably were not drilled very deep. Subsequent communication from the Awasa Textile Factory indicated that they were drilled 60 to 80 meters deep. Pre-softening of the water is required before using it in the dyeing and finishing operations, with additional treatment to remove silicates necessary for water used in the boiler.

The only effluent treatment in evidence at this factory involves a series of three receiving tanks for the overflow water from the mercerizing range. Overflow from the stabilizer washer is collected in the first tank; overflow from three succeeding wash boxes is collected in the second tank; then both of these tanks feed into a third tank where the diluted solution is injected with phosphoric acid to adjust the acidity. The stated intent is to control the pH within the range of 6.5 to 8.5; however, instrument measurement during the team's visit gave a pH reading of 9.5. The discharge from this treatment tank flows to a settling pond; any overflow from this pond drains into a swamp.

D2. Boilers

Three oil-fired boilers generate the steam needed for warp sizing and for the dyeing and finishing operations. A fourth unit is used to provide hot oil to the drying equipment in the dyeing and finishing operations.

Design and construction of these boilers appears to be adequate, as does the testing equipment and procedures used to monitor their water supply. The boiler facilities also appear to be orderly, clean, and well maintained.

It was surprising to learn that the Awasa Textile Factory has a routine practice of "blowing down" (flushing hot water while replacing with cool water) the boilers every eight hours. The reason for such frequent repetition of this activity would be based on inadequate treatment of the water feeding into the boilers. Yet the softening and silicate removal processes appear to be adequate; if so, the blowing down of these boilers should be done at most on a weekly basis. It is a costly practice for the following reasons:

- Excessive energy is used to bring the boiler back up to operating temperature.
- Substantial delays are incurred in reaching temperatures for finishing operations.
- Frequent changes in temperature cause damage to the heat exchanger tubing.
- Treated water is wasted because it is flushed out of the boilers.

D3. Singeing and Wetting

This is a continuous operation to remove the loose fibers from the surface of the fabric and to prepare the fabric to enter the scouring and bleaching machinery. The fabric is passed through a chamber where both sides are exposed to a controlled flame. Controls appeared to work well and air-to-fuel ratio appeared to be correct.

Unlike most of the other equipment in the dyeing and finishing operation, the squeeze rolls for this equipment were in acceptable condition.

D4. Scouring and Bleaching

The sizing is removed from the woven fabric at this stage; however, this was impaired by the very poor condition of the squeeze rolls receiving the fabrics coming out of the first wash box. In fact, all the squeeze rolls in this unit were observed to be in very poor condition. As soon as possible, they should be recovered and properly "crowned" to get adequate performance in scouring and bleaching.

After bleaching, an organic stabilizer is used in place of silicate. This is a commendable approach for this factory. As previously mentioned, the large amounts of natural silicates in the water supply must be removed to prevent boiler tube scaling. Because of the unstable nature of silicates, their use should also be avoided in the finishing operations.

D5. Mercerizing

The factory is currently using block or dry caustic soda; after it is put into a cool mercerizing solution and checked for concentration and temperature, the caustic is pumped into the impregnation chamber with the fabric. The fabric is exposed to the liquid solution for 50 seconds, which should achieve adequate, consistent mercerizing as long as other factors are under control.

The plant's use of block or dry caustic was discussed at length because it is a likely source of problems with the refrigeration equipment used to cool the caustic solution. It appears that the refrigeration unit is undersized for this type of mixing. While no one was sure, it is suspected that the capacity of the refrigeration unit was designed for use with liquid caustic. Fortunately, the plant now has access to liquid caustic solution. Storage tanks are now installed on the grounds and receive deliveries. It was estimated that only a few weeks' inventory of the solid caustic remained, after which time the plant will switch to liquid caustic.

In addition to switching to liquid caustic, the factory needs to consider installing a caustic recovery system for the mercerizing operation. It has none now, so the caustic solution is dumped into the general purpose receiving pond where it will destroy the bacteria used to decompose the dyeing and finishing chemicals. Moreover, failure to reclaim the caustic, and to reuse it repeatedly, imposes a significant and unnecessary cost.

Following the mercerizing impregnation chambers, the mercerizing range contains one stabilizing box and three wash boxes. Throughout, the squeeze rolls are in very poor condition; we suspect that they may be a source of shade variations in dyeing.

D6. Drying

There is one cylinder dryer; on the input side it has a pad that can be used for additional washing overflow rinsing. This capability is used only when employing this dryer after the mercerizing process.

The plant management knows that the cylinder dryer's rate of production is slow. We observed that the unit was being run at relatively slow speeds. We suspect that the reason this practice has evolved is at least partially due to inadequate ventilation to serve the various dry can positions. The vents on the dryer have not been exhausted to the outside, as is the normal practice. Indeed, the lack of proper ventilation is the main cause of the condensation problems experienced during cool weather. If exhausting to the outside is not sufficient to alleviate the problem, then the next step would be to install vane axial fans to assist the output ducts.

D7. Dyeing

The dyeing area is fraught with the chronically poor condition of various squeeze rolls. The pad squeeze rolls are in very poor condition and threaten to become the source of unevenness of dyeing, including imparting a "cascade" effect. The squeeze rolls on the chemical pad also need immediate attention. Finally, the wash box squeeze rolls after the steamer section are in very poor condition.

We observed—and machinery operators were already aware—that the pneumatic pressures on the chemical pads fluctuated constantly. The fluctuations appear to be caused by a line pressure problem, which could be remedied by resizing the supply line or by creating a loop line between the supply line and regulator supply ports.

Temperature fluctuations in the second stage dryers are also substantial and can cause unsatisfactory shade stabilization due to erratic curing. The primary cause of this problem is that the instrument that controls the temperature malfunctions.

There is an obvious need to install proper ventilation to serve the drying cylinders used in this area. The inadequate ventilation is manifested by substantial condensation on the ceiling. This problem would no doubt keep this unit from running at its rated capacity if the management and operators attempted to do so.

The steamer section and most other components of the dyeing section appear to be adequate and functioning normally.

D8. Printing

There is one rotary screen print machine that is capable of applying eight separate colors. A hot-oil heat exchanger is used to power the drying and curing section. Depending on machine speed, the curing time varies from two and a half to three minutes, which is inadequate when using pigment dyes. The inadequate curing time adversely affects the crocking and the colorfastness of the fabrics processed. Although the previously mentioned venting for the dryers would also improve the operation of this machine, adding a second curing section to this machine would be justified. It also should be properly ventilated upon installation.

Fabrics that are printed using pigment dye stuffs have a natural tendency to be somewhat stiff and have a harsh feel (i.e., a "harsh hand"). The accepted method of alleviating this problem is to use calendaring rolls, but this print machine does not have them. Addition of a calendar section will be necessary to make the printing process a world-class operation.

D9. Tenter Frames

There are two tenter frames; one is a hot-oil heat exchange unit and the other is heated by steam. Maximum working width of these machines is 180 centimeters. They are clip-type tenters (rather than pin tenters); the clips are in fair condition.

Maintenance of these units appears to be above average; however, the padding squeeze rolls for the application of finishing chemicals such as softeners, stiffeners, or resin finishes are in poor condition.

The tenter dryer, which uses a hot-oil heat exchanger, is quite adequate and has been used for heat setting of fabrics made of polyester/cotton blends. It would not be practical to handle such blends using a steam heat exchanger.

D10. Shrinkage Control

Although some plant personnel referenced the shrinkage control unit as a Sanforizer, it lacks the capability for chemical treatment of fabrics that characterizes the branded Sanforizer equipment. It uses mechanical stress and heat to achieve some shrinkage control; it has a three-stage mechanical arrangement for stretching that affects both width and length of the processed fabric.

We were told that this machine is used in the processing of polyester/cotton fabrics. If so, this constitutes an unnecessary additional step because control and stabilization has already been accomplished with the tenter frame. The reason is that the tenter frame is heated by hot oil, which gives a higher temperature than the steam heated shrinkage control unit does. With polyester, the higher temperature will always determine the state to which the fiber will return.

D11. Finished Fabric Inspection

Four inspection machines are in place for finished fabric inspection. Fabric is graded at this point for weaving and finishing defects. Fabric defects are marked by tearing at the beginning and end of the defect location. The fabric is then transported to the folding operators, who are responsible for cutting out the defective sections. However, good quality control techniques would integrate the marking and cutting into a single, continuous operation. This would greatly reduce the chance of missing the tear at the subsequent operation.

While defects are recorded and submitted to the quality control section and passed to the weaving and finishing departments, there is apparently no system in place for reporting the corrective actions taken. The departments should provide this feedback to quality control.

It was noted that strength tests for finished and greige fabrics were not done. Also, for the cotton/polyester blends, no pilling tests were done. The capability to do both tests will be necessary to develop export markets for the factory's products.

E. Conclusions

This relatively new plant exhibits the best engineering we have seen in Ethiopia. Layout of the plant, the electrical system, type of equipment, and balancing of departmental capacities are generally appropriate for the type of production that was intended when the plant was constructed. Clearly, however, the ventilation system for the dyeing and finishing areas is inadequate.

It should be emphasized that the Awasa Textile Factory was *designed* to do all the dying and finishing of fabrics produced at the Arba Minch Textile Factory; therefore, there is a strong *prima facie* case for integrating the top management of these two companies.

E1. Technical Capability for Global Competition

With a significant (i.e., expensive) refurbishing project, a vigorous maintenance program, and some relatively minor upgrading of the building and the equipment, the Awasa Textile Factory could, from a technical standpoint, operate at 95 percent efficiency and compete on an international basis. The expenditure necessary to achieve this would be futile, however, unless management organization and operating methods are radically changed. The consensus of the technical team is that this factory is just a couple of years away from reaching a state that will make it incapable of producing textiles of an acceptable quality.

A major barrier to continuous operation at a world-class level is the inadequate electrical generation and distribution system in the region. While the electrical system for the plant is generally good, with an excellent stand-by generator to provide lighting and emergency power to certain critical operations in the finishing department, many problems with equipment throughout the plant are likely caused by intermittent and unreliable electrical power coming into the factory. For example, this is the primary reason for the circuit board failures on the autolevellers for the drawing machines.

There is substantial excess labor throughout the factory, although it was not as serious at Awasa as at several other factories. In spite of the abundant labor, no contingent of workers was used to clean and maintain the plant or the grounds. In a modern plant like this one, cutting the workforce to a reasonable level could actually improve its functioning. This issue is made more urgent by the current low capacity utilization.

E2. Management

Due to circumstances beyond his control, the current general manager of the plant was away from Awasa. Therefore, we did not meet with him personally. We did meet with several of the department managers; several of them seemed to have competent academic training but little practical experience in operating a modern mill.

There appears to be a general reluctance to analyze situations, make decisions, and take actions. For example:

- When shifts change, the machines stop for at least several minutes while the current shift operators leave and the new shift operators arrive. The explanation for this was that transport arrangements required such a procedure. Clearly, transport arrangements should accommodate production requirements. It is important for previous shift operators to hand over running machinery to new operators, and explain to them any problems that have occurred. Only then should they leave the machines.

- Fabric from the Arba Minch Textile Factory, sent for dyeing and finishing, was observed stacked in the finishing area, rather than stored in an orderly fashion in the greige fabric storage room. There was plenty of empty storage space, and no one could explain why it was not used.

E3. Training

A visit to the training center revealed several classes in progress and an impressive supply of manuals for training in all sections of the factory. We observed that the AMPS training system had been installed by UCO consultants; this is recognized internationally as one of the best systems and is appropriate for this factory. Sadly, the performance evaluation charts on the wall revealed that, after a promising start, all trainees had trailed off in performance to the point that they had not only fallen outside the normal performance band, but had continued to fall behind at an increasing rate. The AMPS training program has proven effective in many places in the world, but these results strongly suggest that the trainees lacked incentive, encouragement, motivation, leadership, etc.

E4. Maintenance

Maintenance standards are grossly insufficient. A careful analysis of spare parts requirements should be done and stocks made adequate; this does not mean stocking to excess nor does it mean stocking unneeded parts. But when spare parts are needed they should be available and personnel should be encouraged to use them. Short cuts and substitutes need to be discouraged. We saw little evidence that adequate preventive maintenance was carried out.

Cleanliness was lacking throughout the plant, but was most apparent in the dyeing and finishing department. The dye and chemical storage area was very dirty and disordered, with particularly hazardous chemicals kept alongside other chemicals, rather than in a special storage area.

E5. Quality Control The general standard of production, while not bad, should be much better in a plant of this age and construction. As previously indicated, unless attention is given to the appropriate details, the ability to maintain a threshold level of quality will be at risk within a few years. The plant is ideal for the products currently made; although the market dictates what can be sold, it is imperative to position the company so that it makes the products for which it is best suited.

The fiber and yarn testing laboratory had some relevant instruments for quality control measurements. However, a Fibergraph was not operational and a Uster Evenness Tester for yarns was not used in the timely way necessary to benefit processing quality control. Neither was a manual, single yarn strength tester being used; it is insufficient for adequate monitoring of yarn strength. Surprisingly, an instrument that is normally used intermittently to collect research information on fibers seems to be the focus of attention in this laboratory; namely, the Shirley Analyzer. It was explained that the Shirley Analyzer was used by the factory to arbitrate the price of Ethiopian cotton; however, it is apparently not used to cull unacceptable cotton or determine how to use the cotton in the plant.

The color laboratory is poorly equipped to meet commercial quality control and product development needs for a dyeing and finishing facility of this size (i.e., one that is applying both reactive and vat dyes). A significant increase in the demands made on the dyeing and finishing operation would expose an inability to develop new dye recipes and procedures effectively. The color lab has a sample pad roll in poor condition and a free-standing laboratory oven. The washing of sample fabrics is done by hand. Consistency of results requires that the color lab obtain a continuous, calibrated instrument; i.e., a laboratory pad with washing and drying boxes. The lab does crocking and washing tests, but has no xenon arc instrument for testing light fastness. This will be a necessary instrument if significant export business is ever developed with industrialized nations, as would instrumentation to do exact color matching on demand. All color matching is currently done by visual inspection and is not dictated by the customer.

E5. Technical Recommendations

E5a. General

- Develop and execute an effective training program for management and operators. Without this, equipment improvements and procedural changes will not yield the efficiency gains sought.
- Establish and maintain an adequate cleaning, inspection, and maintenance program for machinery and equipment.
- Optimize machine settings and processing parameters for the specific yarns and fabrics produced.
- Set air conditioning controls to maintain a proper balance between dew point and relative humidity settings.

E5b. Spinning Operations

- Make a standard practice of lining up and opening new bales of fiber as soon as possible after the automatic feeding head is switched to a new lay-down. This will allow the bales to "bloom," which improves blending and consistency of feeding.
- Establish bale opening procedures to minimize the contamination from bale coverings.
- Avoid combining new and old wire when reclothing the carding machine. Either use old wire which has adequate life throughout or use new wire throughout.
- Adjust the condenser speed on the waste removal system of the cards to ensure that the waste mat is properly removed by the pneumatic system.
- Establish an appropriate schedule for burnishing the flat wires of the cards to ensure that dirt and trash from them do not contaminate slivers.
- Repair and use the electronic draft controls on the drawing machines; take steps to minimize damage from the unreliable electrical supply.
- Install good apron tension devices on every position of rovin and spinning machines; find and correct causes of broken devices.
- Immediately stop using the defective cops to avoid damage to the spindles.

- Reconfigure nozzles on the overhead cleaners for spinning machines to enable adequate cleaning of creels.

- Give priority to fixing multiple problems in winding, doubling, and twisting operations.

E5c. Weaving Operations

Consider ways to improve conditioning of cone yarns before putting them on looms.

- Determine reasons for multiple failures of creel cleaning fans on the warping frames and install replacement fans.

- Give immediate attention to multiple problems in sizing area; solutions here will alleviate many subsequent problems. Do not avoid installing a sump and trap in the steam line, since nothing else will ensure that the supply of steam is free of condensate.

- Give priority to repairing, refurbishing, and maintaining the looms; act on problems regularly noted in quality control inspections.

- Integrate fabric inspection operation into a timely quality monitoring program.

- Assess the type of inspection that is most appropriate for specific fabrics and act accordingly.

E5d. Dyeing and Finishing Operations

- Establish a program of regular cleaning and maintenance and insist on carrying it out; reinforce it with an aggressive training program. Cleanliness and orderliness present many distinct challenges in the wet processing operations, but they are critically important. For good results, it is also imperative that monitoring instruments, gauges, and controls be reliable and consistently used to guide these processes.

- Re-cover almost all of the squeeze rolls throughout the department and maintain them with appropriate re-grinding. Management needs to determine and enforce a normal maintenance and replacement cycle.

- Properly vent all dryers to the outside of the building. This is necessary for efficiency, quality control, and building integrity.

- Hasten to install a caustic recovery system for the mercerizing unit. With consistent use, a full payback could well be realized within several months, then perpetual savings in liquid caustic purchases would occur. Also, quality of the waste water would be greatly improved.

- Install an additional curing oven and a calendar unit in the printed fabric processing line. The oven will ensure consistently adequate curing and the calendar will impart a softer hand to the printed fabric.

- Make necessary alterations related to air supply lines to chemical pads to stop fluctuations in pneumatic pressures.

- Establish and monitor a reporting system for corrective action taken on quality problems reported by finished fabric inspectors. Unless corrective action is the end result of the reporting system, it becomes an added expense rather than a means of reducing production costs.

- Assess equipment needs for the color laboratory; begin to add new instruments and train operators in their efficient use. Timely development and control of new and existing dye formulas/recipes will be necessary to serve most export markets, as will the ability to do exact color matching on demand.

- Reassess the frequency of blowing down the boilers. If the frequency can be reduced, significant cost savings can be realized and unnecessary damage to the heat exchanger tubing may be avoided.

ANNEX J

TECHNICAL EVALUATION OF ARBA MINCH TEXTILE FACTORY

ANNEX J
TECHNICAL EVALUATION OF ARBA MINCH TEXTILE FACTORY

A. Introduction

The technical team visited the Arba Minch Textile Factory on March 21, 1996, to make a technical inspection of the plant. This is the newest plant operating in Ethiopia, having started production in 1992. Plant operations include spinning and weaving; most of the fabrics not sold as greige goods are taken to the Awasa Textile Factory for finishing.

The modern buildings were purposefully built and are in good condition. However, in the main building, the floor has deteriorated in a few areas and access covers which had been broken or removed were replaced with poor substitutes. This should not be the case in a building that is only about four years old.

B. Spinning Operations

The spinning operations at Arba Minch are distinguished by the fact that both do ring spinning and open-end rotor spinning. The output capacities of each of these lines are approximately equal.

B1. Opening Line

This area is structured to run up to three combinations of fibers simultaneously if necessary. There is no automatic feeder; bale stocks are fed into the opening line by hand. Operators were pre-opening the stock by hand before placing it onto the feed apron, which did at least marginal damage to the staple.

B2. Carding

Flats on the carding machines needed sharpening; they were among the dullest observed at our mill visits. Several holes due to screen chokes were observed in the card webs.

B3. Lap Forming and Combing

The plant has one lap forming machine and four combing machines. They appear to be in good shape for production; however, they are not currently used.

B4. Drawing

All of the fourteen drawfames in place are two-delivery Marzoli machines (Model SH2) which are capable of consistent production of high-quality slivers. Nine of these frames are equipped with electronic autolevellers supplied by Uster Corporation. However, the autolevellers are not used because of electrical problems. This emphasized to us once again the basic need for reliable electrical supplies for a modern facility like this one to realize its potential.

B5. Rovin

Several problems were immediately seen in the rovin department.

- The first twelve spindles of rovin checked were operating without bottom aprons. This leads to excessive ends down on the ring spinning frames supplied by these rovins.

- Cleaning and maintenance is inadequate for good, consistent operation of these machines. In particular, the top roll coverings are kept much too long for efficient performance.

- Routine maintenance (for spindle gears, drafting systems, etc.) is lacking. Labor seems abundant to execute such maintenance; more planning and management is needed.

Discussions with plant personnel informed us that there are problems with keeping an adequate supply of rovins to the spinning frames. This is not due to an imbalance in the capacities of the two operations; rather, management needs to focus on remedies to the problems limiting the output of the rovin department.

B6. Ring Spinning

It was apparent from observing the ring spinning frames that the operators of the rovin frames were short-doffing them, i.e., not waiting for the frames to reach their pre-set linear length. This was revealed by the fact that the supply creels of the spinning frames were much too low on stock. This practice should be stopped for several reasons, including the following:

- It is expensive and inefficient to handle more rovin packages than necessary for the spinning output.

- It runs a risk of covering up the problem at the rovin frames until there is chronic problem with shortages to supply the spinning frames (as noted above).

- It risks falsification of the value of stock-in-process. An educated guess is that, due to this practice, the working inventory in the ring spinning department may be overstated by approximately 7,500 kilos.

As with the rovin frames, the spinning frames are not equipped with aprons on many spinning positions. This will compound the problems that occur in weaving efficiency and fabric quality.

Finally, the cleaning and maintenance of the spinning drafting system can only be rated as poor. This is quality equipment, but it will not perform to its potential unless it is cared for more intensively than is now the case.

B7. Open-end Rotor Spinning

This department was really not engineered correctly to produce the types of fabrics that were projected to be produced at the time of construction. The brand and model of the frames used here (Elitex BD-200) are appropriate for a limited number of applications because rotor speeds are restricted. For the yarns and fabrics produced at Arba Minch, the higher rotor speeds available from other manufacturers are needed for good efficiency. These alternative machines were readily available when this plant was constructed; therefore, even though new machinery was installed, it was already obsolete.

Of course, this equipment can be used, subject to proper maintenance. Items that need attention include the rubber gaskets for the cleaning doors to the rotors. These have deteriorated very badly and are a major contributor to an excessive number of ends-down on these frames. Since the procedure to replace these was not known by anyone at the plant, it seems likely that none of these gaskets has ever been serviced. This is indicative of the need for fundamental improvements in production management.

B8. Winding

The winding department provides another example of the installation of new machinery with obsolete technology. The six Elitex Autosuk winders are copies of the old Uniconer winders originally built by the Leesona Corporation in the United States more than 30 years ago. They eventually became inferior in terms of efficiency and maintenance and required much more training of operators to perform well. These disadvantages resulted in the demise of this winding machine.

Through discussions and observations, we learned that these winders have problems with cone-to-cone variations in package density, poor yarn splices (resulting from poor knotter maintenance), and fraying of the yarns. While none of these problems is insurmountable, better-than-normal management procedures are required to make this department successful.

C. Weaving Operations

The weaving operations are balanced around a total of 232 Picanol GTMA rapier looms. The layout for these operations is good and material flows should be efficient.

C1. Warping

The quality of the beams coming off the warping machine was very poor. Tensions of the yarns were highly variable resulting in uneven distribution across the beam. The causes of this were identified as:

- A build-up of spin finish on the warping creel tension pegs
- Incorrectly threaded pegs
- Different creel tension weights
- Tension weights missing
- Dirt under tension discs
- Caps missing on tension pegs
- Different sized warp packages
- Creel sides being set at different distances from the cones

None of these points would be difficult to correct, but the improvement would be quite substantial.

C2. Sizing

The sizing was being successfully accomplished even though the department did not have a viscometer to check concentration. The adequacy of the size was evidenced in the weaving room by the facts that (1) no fibre or fluff was being created from the action of the drop wires and heedles, and (2) no size deposit was building up on loom parts.

This sizing machine is the same make and model as the one at the Awasa Textile Factory but is somewhat newer. Recalling that the entry drag roller gearbox was broken on the machine at the Awasa plant, note was taken of the fact that a heavier type gearbox had been fitted on this machine and was functioning well.

C3. Weaving

Of the 232 looms installed, 132 are plain weave machines, 70 are for 3/1 twill, 20 are for 2/2 Panama, and 10 are equipped with dobbies. Currently, due to a lack of sales, 132 were sheeted up; of the remaining 100 looms, only 83 were in fact gaited and less than 40 were running.

It was surprising to see that all the looms were single pick machines with only one accumulator. For machines of this speed (rated at 400 rpm), a pick-and-pick with two accumulators is necessary to avoid too great an unwinding tension on the weft cone, resulting in excessive weft breakages. Pick-and-pick also has the advantage of hiding minor variations in individual weft packages.

An erroneous practice noted is that of only using one weft package and not tying top-to-tail for continuous running. This negates many advantages of the expensive automatic machines and increases quality problems such as start marks on the fabric.

It was also noted that the warp tension at the loom was far too high. This causes high end breakage rates on some of the finer yarns.

C4. Greige Fabric Inspection and Folding

There was an estimated four-to-five week backlog of cloth between weaving and inspection, yet all inspection machines were in operation. Just one machine should be able to cope with the present rate of production. Fabric should be inspected immediately after it leaves the loom so any problems can be corrected. It is useless to conduct inspection several weeks after the fabric has been woven.

As was the case at Awasa, this plant used only illuminated panel machines to inspect the fabric. With the fabrics produced, reflected light would be better for revealing the kinds of faults most important to consumers. Of course, a world-class weaving operation would need both types of inspection machines.

It was noted that most, if not all, weighing machines needed repairs. Several had reportedly never worked since they were supplied.

E. Conclusions and Recommendations

If a moderate upgrading of equipment and an adequate maintenance program is combined with an effective training program for management and labor, the Arba Minch Textile factory has the potential to produce high quality fabrics that can be channelled into diverse end uses. These actions must be accompanied by an adjustment toward *fewer* workers that are paid *higher* wages. This is quite feasible at Arba Minch. For example, with weaving machines such as the ones in this plant, it is quite feasible for one skilled operator to look after 32 to 48 machines rather than 6 to 10 machines as presently targeted.

The technical team was impressed by the eagerness of the people at the Arba Minch plant to observe, discuss, and consider alternatives. Nevertheless, there was evidence that workers lacked adequate training or motivation, and that management was not free to take action on key issues such as staffing, discipline, training, and compensation. In the final analysis, it makes little sense to spend millions of U.S. dollars for a building and equipment such as that at Arba Minch and then to operate it with workers who make only a few birr per day.

These strategic issues must be acted on simultaneously with actions taken to eliminate or alleviate the problems noted in the body of this annex on Arba Minch. Only then will the progress made on the technical issues translate into significant gains in efficiency and competitiveness.

ANNEX K

TECHNICAL EVALUATION OF BAHIR DAR TEXTILE FACTORY

PREVIOUS PAGE BLANK

ANNEX K
TECHNICAL EVALUATION OF BAHIR DAR TEXTILE FACTORY

A. Introduction

The technical team visited the Bahir Dar Textile Factory during April 30-May 1, 1996, to perform a technical inspection of the plant. This integrated textile factory was established in 1961, and it has some equipment dating back to that time.

B. Spinning Operations

B1. Opening Line

There are two separate opening lines for the plant. Both are fed by four feed hoppers supplied by extended lattice feed tables. The older feed line supplies only 8 cards while the new line supplies the remaining 22 two cards.

B2. Carding

The department has 30 cards in place, all of which were built by Marzoli of Italy in 1961. Although they are old, they are not obsolete. If properly maintained, these cards will be adequate for producing good quality yarns for several years to come.

Three of the 30 cards are currently standing idle—and have been idle for up to four years—due to failure to repair damaged cylinder or doffer wires. The reason given was lack of new wire. However, because the factory has a practice of reclothing its own cylinders and the undamaged wire is still useful, two of the three cards could be restored to service without buying new wire. To do this, wind the undamaged wire onto a wire spool. When a point of damage is reached, remove the damaged wire and re-join the good parts by brazing the two wire sections together. Then, wind the wire off the spool onto the cylinder or doffer in the same manner as installing new wire.

Five additional cards were stopped due to the unavailability of electrical and drive belt replacement parts. Thus, a total of over one-fourth of this plant's carding capacity is disabled. It was explained that some of the parts needed for electrical repair were not available from the original manufacturer. This is an inconvenience, but it need not prevent the procurement of replacement parts. Other suppliers in Europe and Asia, and some in the United States, offer replacement parts that are as good or better than the originals.

B3. Drawing

The drawing machines are also manufactured by Marzoli equipment, but they are recent models with a three-over-four roll drafting system. They are good, dependable machines; nevertheless, two of the eight drawframes are currently out of service due to mechanical and electrical causes.

The pneumatic clearers were not operating properly, causing a significant build-up between the top covered rolls. Also, the pneumatic cover system was not operational on all frames; personnel said that this had been a persistent problem since the equipment was new.

The four breaker drawing machines are equipped with the Uster ADC system of autoleveling. More importantly, three of the four were operating at the time of the team's visit. This is the only plant where a significant portion of installed autolevelers are functional.

B4. Rovin

There are 12 Marzoli rovin frames in the plant. During a 1989 renovation, 9 of them were fitted with SKF-225 top arms, while 3 were left with Suessen top arms. It is standard practice at the plant to avoid using the three frames without the SKF top arms, except when spinning coarser counts of yarn. Yet, except for the weight cartridge of the front top roll, the Suessen top arms are generically identical to the SKF top arms. The fact is that the renovation would have been just as effective if only the front roll weighting cartridges had been changed, which would have cost only about 10 percent as much as SKF top arms.

B5. Ring Spinning

There are 50 Suessen spinning frames, but 13 of them were not operating during the team's visit. Like the three roving frames mentioned above, these 13 spinning frames were not equipped with the SKF-225 drafting system back in 1989; therefore, they are used only for spinning coarser counts of yarn.

Lengthy discussions took place about the Suessen top arm drafting, comparing it to SKF-225 system and analyzing the possibility of it producing work of equal quality if set and maintained properly. Both systems use spring weighted top arms to apply pressure to the top rolls of a three-line, double-apron drafting system. It was indicated that the weight arm of the Suessen system was too hard to latch, but straightforward adjustment is all that is required. Unfortunately, no one at the enterprise was aware of this. This lack of professional technical assistance penalizes this enterprise, as it does all others in Ethiopia.

The control draft section (or middle roll and cage and apron) of the Suessen and SKF draft systems is a Duo-Roth design. It uses a long bottom apron with a short top apron in a cage section, with adjustable delivery opening spacers affixed.

While there are some problems with the pneumatic system for collecting broken ends, they are not serious enough to require total replacement. Relatively minor repair parts and careful adjustment of the flutes would be enough. The vacuum boxes, however should be placed on an adequate maintenance schedule, cleaning the screen section and repairing breaks or tears in the screens as necessary. This will stop the lint from getting into motors and fans, as is now occurring.

The spindle tapes used appear to be made from a cotton blend. The plant is buying these in bulk, so that the tapes are not precut to size. The majority of the obviously newer tapes observed have been cut slightly too long, resulting in spindle speeds that are much below optimum levels.

B6. Winding

Although the winding machines are equipped with electronic yarn clearers, winding from bobbins is a manual operation because they are not operational. These units were purchased from a dealer, rather than from Uster Corporation, which explains why the number of supply lines feeding the clearer units from the power supply control panel is double the normal number. Improper wiring is likely the major cause of failure of the system.

For the bobbin winding, it is also obvious that package density varies from end-to-end. Steps should be taken to correct this.

Three Scharer prin winders were used for winding the optical pirns used on Ruti C looms. Three old Bruegger prin winders (20 heads each) were used for winding pirns for Galileo looms. All of these winders were performing well at the time of our visit and appear in good mechanical condition. This conclusion was corroborated by observing the performance of these pirns used in weaving operations.

B7. Twisting

Three two-for-one Allma-Saurer twisters are available for producing plied yarns. The machines appear in good condition, although they were not operating while the team was there.

B8. Reeling

There are a total of 18 reel units with a total of 1,560 positions. These are used to provide hanks of yarn to the hand weaving market of Ethiopia. The records indicate that these were purchased used back in 1962. Nevertheless, they are very simple machines that, with proper lubrication and minimal maintenance, can last for many years.

C. Weaving Operations

The weaving department had been substantially refurbished and partially re-equipped in 1992 with Somet SM93 machines and associated preparatory machines. The output of the Somet looms was incompatible with the capabilities of the dyeing and finishing department; therefore, the intent is to sell greige fabric made by them to the domestic and export markets. Fabric sales have so far not been adequate to use the Somet weaving capacity. While the team was there, however, virtually all the looms were running; spot checks indicated that this plant was achieving the best efficiency and performance in the whole of Ethiopia. The weaving manager appeared to be well in control and the department was clean and well organized.

C1. Warping

Two warping machines were in operation. The creels were well organized, all creel pegs aligned, and all tension devices correctly threaded and weighted. Unfortunately, on one of the units only one of the eight creel fans was working correctly. Two fans were not rotating at all and five were not oscillating. As a result, fly was accumulating in a number of areas, particularly around the stop motions. This fly was disturbed at regular intervals by the passage of the yarn, resulting in large pieces of it being taken into the warp and held by the reed. This caused end breaks and other yarn quality problems. Otherwise, the beam winding was very good, with the operators conducting their work conscientiously. The only criticism is that they were tying knots with long tails.

C2. Slashing/Sizing

There is an old Rotal/Westpoint seven-cylinder sizing machine which was not operable at the time of the team's visit. Its main motor had been removed for repair.

A new Rotal nine-cylinder machine is running well and is adequate to handle the current output of the weaving department. It was a pleasure to see that this machine was being operated correctly and the automatic controls were fully functional. Optimum drying was achieved, with a residual moisture level of 7 percent, when the machine ran at 45 meters per minute. The automatic hot-melt liquid waxing device was operating correctly; observations at the looms affirmed that its results were good.

The quality of the beams was very good. Most of the looms had two warp beams, with the number of warp ends for its fabric production equally divided between them. This allowed only half of the total ends of a single fabric to be sized at once, which in turn means that the warp sheet was quite spread out during sizing. This approach ensures that every yarn is thoroughly coated with size and lubricant. This showed in the weaving room, where the efficiency and fabric quality was generally good.

C3. Weaving

Weaving activities are distributed over two weaving rooms. The smaller one contains 48 Ruti C shuttle weaving machines, all of which are operational and in very good condition. The pirn batteries are complete and operating in conjunction with optical feelers. All machines were weaving 54-inch sheeting material. It was observed that all except eight were running (indicating a shed efficiency of 84 percent). Instruments revealed that the relative humidity level was 78-80 percent, which is a desirable range. The only criticism of this operation would be that an occasional warp sheet was too tight.

The adjacent and larger room accommodated 134 Somet SM93 rapier weaving machines of 190 and 280 cm width, together with a small section with 45 old Galileo shuttle underpick looms.

The Somet weaving machines were in excellent condition; only one machine was down, waiting for spare parts. Six more machines were stopped, but only because capacity was not required. Eight looms were allocated per weaver, and all operators appeared to be relaxed and in control. They were using the correct weaver's knot and were clearly attending to their looms. However, they appeared to be spending the predominant amount of time at the front of the loom rather than regular patrolling.

The back beams were very good, with few spare or fed ends. Six row droppers were in use and all were operating satisfactorily. Two ROJ weft accumulators were fitted and the machines configured to operate pick-and-pick, minimizing weft irregularity problems. One major criticism is that the tails on the cones were not long enough to facilitate tying top-to-tail. The cone winders should be adjusted accordingly.

The very old Galileo looms were operating successfully. Although they were not fitted with pirn change batteries, requiring that the pirns be changed by hand, all the machines were working and the wire heads were in good order.

This installation demonstrated that both old and new machines can be operated successfully, if they are maintained and operated correctly. The quality of fabric manufactured in this plant was the best seen in Ethiopia; the weaving manager was permitted to manage successfully and appeared to have the respect of the workforce.

D. Dyeing and Finishing Operations

Much equipment was installed at the plant's inception about 34 years ago. Its inability to handle wider fabrics makes it obsolete, and its poor condition makes it uneconomical to bring it back to an acceptable level of efficiency. Much of the weaving room production must be sold in the greige because it is too wide to be dyed and finished on this equipment.

Unofficial information indicated that a project to renovate the dyeing and finishing operation is either approved or on the verge of receiving approval. Source(s) of funds were not known; neither were specific plans available to the team.

D1. Singeing and Wetting

This machine is a narrow gage and is currently used only for greige fabric batching to an A-frame for the narrower fabrics. Its burner section and wash boxes are deteriorated badly, and repair is not economically feasible.

D2. Shearing

The shearing blades are so poor that all this unit does is batch narrow fabric. Repairs would require numerous replacement parts; again this may not be economically feasible.

D3. Washing

Most of the narrow fabrics, including those that have been mercerized, are put through the washing range. It has a width limitation of 180 cm, which is inadequate for the majority of fabrics produced at Bahir Dar.

D4. Mercerizing

The mercerizing range is limited to fabric that is 140 cm wide. Furthermore, its refrigeration unit is not operating well—a major problem with the cool mercerizing system used. If a new mercerizing system is installed, management should carefully consider the merits of changing to hot mercerization. Also, a caustic recovery system should be considered because it could pay for itself within a year if a significant amount of mercerizing is done.

D5. Pad Batch Dyeing

Both the poor condition and the width limitation of 180 cm make this unit of little use.

D6. Jiggers

The plant is equipped with ten units to scour, bleach, and pad batch dye by the jig method. Widths available are all relatively narrow: 110 cm, 160 cm, and 180 cm. In their present condition they are capable of fairly good performance in the scouring and bleaching operations but perform poorly in the dyeing.

D7. Squeezing

This process is used to extract moisture present in fabrics after being scoured and/or bleached at the jiggers. The condition of the units is only fair to poor.

D8. Tenter Frame

Hot oil is used as the heating medium for this machine, which appears to be working effectively. Because the hot flue machine is out of service, the tenter machine is also used to cure pigment printed light fabrics. While this is feasible, it should not be used to cure heavier weight fabrics because it cannot transfer the amount of heat needed.

D9. Flat Screen Printer

The operators of this printing machine are producing good-looking printed fabrics in spite of the limitations of the machine. It prints only three colors and is limited to fabrics of 130 cm in width.

D10. Calendar

This machine is in fair to good condition and is used primarily to enhance the hand of pigment dyed or printed fabrics. It is capable of processing fabric up to 180 cm wide.

D11. Raising

This unit is used primarily on printed fabrics to yield a flannel-like finish. It is in fair to poor condition; the cylinder wire probably needs to be replaced.

D12. Folding and Doubling

There is no discernable procedure for recording fabric faults at this stage of the process. It is simply a task performed to prepare the fabric for market. Heavier fabrics are folded singly, while the lighter fabrics are doubled, all in preparation to be bailed for shipment.

E. Auxiliary Operations

Only very general observations of auxiliary facilities were made by the team members; they did not attempt to validate most of the information supplied. Comments provided here should be taken with these limitations in mind.

377

E1. Water Supply and Treatment

Water is taken from the Blue Nile River, which flows adjacent to the plant. The treatment method used is fairly standard and is adequate for the uses of the water. However, the plant does not have an adequate water testing laboratory, which means there is significant risk of endangering workers, damaging boilers, dyeing failures, etc. Quality control regarding the water supply water must be a priority, and a well-equipped laboratory and properly trained personnel are necessary to do this.

Neither does the plant have an effluent treatment system, according to the information supplied. This, too, is quickly becoming unacceptable in most parts of the world. As already mentioned, a caustic recovery system should be part of an effective effluent treatment system.

E2. Boilers

Three oil-fired boilers exist at the plant. One is of limited capacity and needs either servicing or replacement. Another is out of use. There are three electric boiler units for heating the hot oil used in finishing operations. Two are functioning, but one cannot be used unless it is reconditioned.

If renovation of the dyeing and finishing operations proceeds, boiler needs must be rationalized with new facilities.

E3. Electrical

According to information supplied, the plant's stand-by, diesel powered generator is adequate to operate the spinning and weaving departments. This puts the Bahir Dar plant in a much better than average situation among Ethiopian enterprises.

Throughout the plant there are instances of electrical problems that should not be present. For example, some switch gears are out of service. The reason given was that replacement parts were not available from the original equipment manufacturer, but such parts are easily identified and bought from after-market suppliers, with quality as good or better than that of the original parts.

E4. Compressors

Compressed air is now supplied by two units that appear to be barely adequate for this plant. More attention to maintaining these units is needed if they are to continue to perform satisfactorily.

F. Conclusions and Recommendations

The weaving operations at the Bahir Dar Textile Factory provide the best example of technical success in Ethiopia. The spinning operations could use numerous improvements, but are generally adequate. The dyeing and finishing operations are obsolete and generally worn out; however, given that plans have apparently been made to replace the equipment in this department, no recommendations will be given here. Finally, the auxiliary operations need substantial renovation and upgrading. Specific recommendations follow:

- Follow the procedures in the text to repair the card clothing on at least two of the cards now out of service.

- Contact electrical supply houses in Europe for information on interchange replacement parts needed to place machinery back into production.

- Re-evaluate card maintenance and grinding schedules, especially regarding the flats.

- Seek alternative sources for needed electrical parts for the drawing frames.

- Place a priority on cutting new spinning tapes to the correct length; if the tape material currently used stretches, change to another material.

- Hasten to repair the pneumatic end-collecting system on the spinning frames. In some cases, repair parts may be necessary, while in others only adjustments will be needed.

- Adjust the individual winding positions on the cone winding machines to produce consistent package densities.

- Repair electronic yarn clearers on the cone winders.

- Repair and maintain the creel fans.

- In conjunction with the new dyeing and finishing department, plan and install appropriate auxiliary equipment, e.g., a caustic recovery system, water monitoring systems, etc.

- Install a water quality laboratory appropriate for use with river water as the supply source; secure a qualified operator who can interact with the production plant and help control the treatment system.

- Hasten to construct an effective effluent treatment plant.

- Institute an effective program to maintain the air compressors.

- Institute an effective program for the maintenance of boilers.

- Seek alternative sources for parts to repair electrical switch gear currently out of service; if activity increases at this enterprise, it will be needed.

ANNEX L

TECHNICAL EVALUATION OF DEBRE BIRHAN TEXTILE FACTORY

ANNEX L
TECHNICAL EVALUATION OF DEBRE BIRHAN TEXTILE FACTORY

A. Introduction

The technical team visited the Debre Birhan Textile Factory on April 18, 1996, to perform a general technical inspection of the plant. The manager of the operation has been at this location for 16 months, having previously been a manager with the National Water Works System.

The primary product of this factory is blankets. It also has looms for producing woven bottom weight clothing fabrics; however, these are currently standing idle, covered with plastic. There is also one carpet loom in production.

The plant is fully integrated in blanket manufacturing, performing all functions from opening and sorting of the raw stock to packaging a finished blanket ready for the retailer's shelf. Raw stock for this operation is derived from mixed fiber waste, which perhaps should be a priority issue for the management at Debre Birhan. The plant manager estimates that the enterprise is experiencing a loss of raw material (in the form of non-usable waste) approximating 50 percent. When such a loss is combined with the relatively high prices for fiber waste during recent months, it seems quite possible that a more cost-effective approach would be to buy unbranded, virgin acrylic fiber. If it is cost-effective, the use of virgin acrylic would enable a higher quality product for Ethiopia's alternately wet and dusty environment and rustic housing facilities. Also, it would make the task of controlling the quality of the finished product much easier.

B. Problems with Production Data

The team was provided average daily production figures for March 1996. The data related to sorting, pulling, dyeing, blending, reusable waste, and nonusable waste (see Exhibit L-1). The data were available for only six days of the week, although we were told that spinning and associated activities operated seven days a week.

The data indicate that, during 26 days out of the month of March, the following daily average quantities were achieved: 8,254 kg of fiber were sorted, 3,454 kg pulled, 2,827 kg dyed, 9,290 kg blended, and 1,275 kg of reusable and 750 kg of nonusable waste were generated.

The spinning output is quoted as 6,200 kg/day; however, analysis of 5 months of data indicates that average spinning output for a 7-day week averages about 5,700 kg/day. Using this 5,700 kg/day output along with the data in Exhibit L-1 yields the following:

- 44.8 percent more fiber must be sorted than ends up in the yarn.
- 63 percent more fiber is blended than ends up in the yarn.
- 58.3 percent less fiber is pulled than ends up in the yarn.

Exhibit L-1. Production Data from Debre Birhan Blanket Factory, in Kg, March 1996

Date	Sorting	Pulling	Dyeing	Blending	Reusable Waste	Nonusable Waste
March 1	9504	986	3000	9799	1252	501
March 2	7746	890	3000	9325	882	1115
March 3	NA	NA	NA	NA	NA	NA
March 4	7854	1669	3000	9226	1135	859
March 5	8204	3235	2800	10220	596	685
March 6	7478	2771	3000	5049	1037	899
March 7	7846	4294	3000	12297	797	511
March 8	6343	4405	2000	10156	1314	291
March 9	7550	3989	3000	6822	1325	1261
March 10	NA	NA	NA	NA	NA	NA
March 11	7404	2893	3000	10679	448	293
March 12	8764	4185	2940	8869	1575	765
March 13	7323	6406	3000	10567	2018	390
March 14	7850	5911	3000	10865	1201	427
March 15	8637	4755	3000	8019	1092	412
March 16	8230	6444	1000	11362	1399	505
March 17	NA	NA	NA	NA	NA	NA
March 18	7242	4028	1750	8549	1370	642
March 19	7324	3877	3000	11858	1941	772
March 20	8152	3205	3000	7396	3164	1943
2 March 1	9529	2507	3000	8466	2025	755
March 22	8295	253	3000	8917	1036	1060
March 23	7688	2867	3000	9394	1319	1100
March 24	NA	NA	NA	NA	NA	NA
March 25	9063	3913	3000	9942	1122	770
March 26	8436	3008	3000	7069	1088	510
March 27	9577	3217	3000	9181	994	780
March 28	9930	3521	3000	11027	847	625
March 29	9638	3270	3000	8601	1122	711
March 30	9001	3294	3000	7889	1044	910
March 31	NA	NA	NA	NA	NA	NA
Total	214608	89793	73490	241544	33143	19492
Average	**8254**	**3454**	**2827**	**9290**	**1275**	**750**

Over a month, almost all usable fiber that is sorted should end up in yarn. An excess of 44.8 percent of sorted fiber implies that nonusable waste amounted to about 2,554 kg/day, rather than the 750 kg/day recorded. A nonusable waste approximating 44.8 percent means that it probably exceeds 50 percent of the finished product.

In addition to the foregoing data, the following annual data, for fiscal year 1994-95, were submitted to the PESA Textile Sector Task Force:

Annual production in tons	2,106,171
Annual acrylic waste in tons	342,808
Reusable waste in tons	458,236
Nonuseable waste in tons	301,594
Total waste in tons	5,208,809

These data are clearly wrong. Perhaps the units should have been kilograms; regardless, the number for total waste is meaningless because it is the sum of the four items above (the sum of production and consumption). Furthermore, the sum of production and nonusable waste—2,407,765—is 64,957 greater than the raw material consumption, a physical impossibility.

The frustrating conclusion is that the data are unreliable in the extreme. The best guess of the team, based on all data and other information that can be interpreted, agrees with the plant manager's belief that the waste factor is approximately 50 percent.

C. Spinning Operations

Spinning is on the woolen system, using dual cards equipped with rub apron condensers and tapes to make up the condenser roll for the spinning frame. The spinning frames are also equipped with false twist tops for balloonless twisting.

C1. Sorting

Sorting, the first step in the manufacturing process, is performed by having large amounts of waste fiber in an open-ended compartment, with employees sitting on the floor hand-sorting the waste. They make a visual determination of the types of fibers, separate them from the acrylic and wool used to make blankets. Other fibers commonly found include polypropolene, polyester, and nylon. The wool fibers are identified largely through subjective judgement about its odor.

This is obviously a highly labor intensive operation. The general manager stated that there were 130 people involved in this task.

C2. Pulling

The pulling process opens the mangled waste. An almost new machine is used to do this. The old machine it replaced should be removed and seems to be kept only to elevate the plant's asset value. With no significant market value, it should be accorded none in a proper accounting system.

The new pulling machine appears costly to operate. It has a 97 kilowatt rating, which means that it uses 97 kilowatts per hour. Adding the cost of normal maintenance and depreciation, this is a very expensive machine to use. This would be an unnecessary operation if an unbranded virgin acrylic were used.

C3. Cutting

This operation simply cuts fibers judged too long for spinning to an acceptable length. This is another step that would be unnecessary if virgin acrylic were used.

C4. Carding

The five carding machines in the plant all have woolen tandem cylinder cards equipped with tape condensers and rub aprons. One was stopped due to lack of repair parts. Typical wear patterns were noted on these units, but they are in generally good operating condition. A few cover doors not secured, but few other problems were apparent.

Lattices between the carding sections are also in good condition. It is commendable that management has a practice of switching to PVC material for the slats in these lattices; only a few wooden strips currently remain on these systems.

The appearance of the condenser rolls indicates that the wire of the cylinders and doffers is in good condition. During the short period the technical team was present, no individual end breaks were noted on these rolls. Inspection of the creels of the spinning frames corroborated this conclusion.

Each card's condenser is configured to produce 4 rolls of 32 ends each. This is a standard configuration for woolen cards of this vintage and matches the configuration multiple of the spinning frames.

There seems to be an assumption that the plant has insufficient carding capacity to serve spinning capacity, but we could not confirm this. It appears that carding capacity would be adequate if only their production rate were increased. Their current production rate is well below the maximum obtainable, even for much higher quality fabric production than this plant is producing.

C5. Spinning

The plants have six spinning frames, two of which were idle during the team's visit. Two explanations were given for the idle frames: they needed repair and carding production was insufficient to keep them supplied.

The frames are appropriately equipped, having spindles with serrations on the top to assist in wrapping the fiber around the spindle tube on the way to the ring traveler. This imparts a more positive twist to the yarn and prevents tensions generated by the normal ballooning of conventional spindles used in other spinning systems. Spindle tubes must be kept clean and free of scratches and burrs to avoid excess hairiness in the yarns produced. Inspection of a sample of spindles indicated this was being done adequately.

Entire frames were stopped to repair end breaks, which is an undesirable operating procedure. This should be done with the frames still operating to increase efficiency and improve overall quality of the yarns on these balloon-less spindles. In general, too many people were in the alleys of the spinning area; they were getting in each other's way.

D. Weaving Operations

The weaving department operates three shifts a day, six days a week. A stated shortage of yarn prevented seven-day operation. As indicated in the comments on the spinning operations, the reasons for this shortage were not clear to the project team and need to be investigated.

D1. Carpet Weaving

One Van de Wiele shuttle carpet machine was installed and in operation. It was fitted with a Jacquard mechanism but was weaving plain wire Wilton carpet. Also, it was operating with one shuttle, making shuttle changes too time consuming. The resulting production rate was slow, at 42 ppm on a machine four meters wide.

The warp pile creel was a primitive inclined rack holding very small packages of pile yarn, a condition that makes it difficult to produce fault-free carpet. Although there were no stop motions on the machine, this did not matter because of the very slow operating speed and the position of the creel operator at the rear of the machine. The Jacquard harness was not tied accurately, with variations of up to 50 mm in the length of the cords. This results in differential shed openings, causing differential stretching of the pile warp threads. The machine was in reasonably good overall condition for its age, but it is difficult to see how it can provide economically viable production.

D2. Blanket Weaving

The following weaving machines were observed:

Twenty-eight Saurer SD rapier weaving machines are installed and in operation. Six are the Saurer 265 and 22 are the narrower Saurer 250. These machines are in generally good condition. Two additional Saurer 250 machines are in place but have never operated. They were not included in the machine inventory. The explanation was that they had been damaged in shipment and paid for by insurance. It may be worthwhile to repair and operate them.

Some reeds were marked, but not enough to adversely affect the product. Due to inadequate loom cleaning, there was too much fly embedded in the heald wires. Edge cutters did not operate consistently, as several rolls of cloth exhibited long lengths of uncut edge. Weft reserve packages were tied correctly, i.e., top-to-tail.

A problem observed was the regular occurrence of large weft packages pulled off the weft package holders by the unwinding yarn. This could be alleviated by inclining and repositioning the weft package creel holders; detailed recommendations on doing this were shared with management.

Five Nuovo Pignone flexible rapier weaving machines Model TP 300 are in operation. These have no weft edge cutters; the edge is cut as a separate task.

Ten Lentz shuttle weaving machines are not operating and are covered up. These were previously used to produce clothing fabrics.

The weaving rooms are not air-conditioned. A suspended ceiling has been installed, but most of its potential benefits are lost because numerous panels are missing.

The team observed an inordinately large number of operators in this department. The staff from the unused Lentz looms were simply dispersed among the rest. There appeared to be one weaver assigned to each loom. Originally, there were to be four looms per weaver; even that figure is far below international standards for looms-per-weaver ratios. The overall efficiency appeared to be approximately 55 percent, while a 75 percent efficiency should be achieved easily.

D3. Warping

To service the blanket looms with warp beams, two section warping machines are in operation and are used to beam two-ply cotton yarns. These machines are old but the creels are in good repair; they were also correctly threaded and operating well during the team's visit. As a result, there were few warp yarn problems observed on the looms.

E. Dyeing and Finishing Operations

Due to the process of making blankets and carpets, dyeing is done before the fiber is processed into yarn. The equipment used is old but is adequate for the present needs of this plant. Of course, funds should be set aside for future investments in the machinery for this department, but this should be done for all departments in an enterprise.

E1. Scouring and Drying

This is a continuous operation in which the fibers are washed and then dried. Afterward, they are put in bales for storage and movement. The dyed fibers are also passed through the drying section of this unit; then they are baled in preparation for blending with other fibers.

E2. Dyeing

Dyeing of the fibers is done on a three-shift basis. The stated daily output for the plant is 3,000 kg/day. This is accomplished using two open bath machines, each with a capacity of 250 kg/batch. The dye machines are accompanied by one hydro-extractor for removal of excess water.

Only grey or white waste of wool, cotton, or acrylic is dyed. Polyester and polyamide fibers that are either white and grey are used as undyed fiber. Dyes used include acid dyes for wool fibers, direct dyes for cotton, and cationic dyes for acrylic fibers.

The batch machines would be quite adequate for this operation if they allowed closer control of temperatures, exhaustion rates, and liquor ratios. Inadequate control of these prevents exact dye lot matches and uniform fiber-to-fiber matches.

E3. Blanket Fabric Inspection

Two machines are used for blanket inspection and finishing; both are in adequate condition. One machine is used to inspect quality, make repairs, or cut out bad places where necessary, and trim the selvage. The other machine is used to measure and weigh the blankets.

E4. Raising

One new raising machine and two older ones are in use. The technique used is to attach several pieces of fabric together into a continuous strand, then run this through the raising rolls several times. It was explained that about eight passes were required with the two older machines, while four passes were usually enough with the new machine.

It is rare to see the practice of attaching blanket fabrics to make a continuous loop. Rather, the material is usually passed through the machine, folded onto a pallet which is returned to the input side of the machine, and then passed through again from the opposite end of the fabric. This approach should produce a better quality product, probably with fewer passes through the machine.

E5. Shearing

Two relatively new shearing machines are in place for use if customers demand it. However, they are not currently operated.

E6. Metering

A metering machine is used for measuring the length and weight of the blanket pieces. This helps the workers who do the finish cut for individual blankets.

E7. Sewing and Labeling

The final operation, resulting in a finished blanket, involves binding the selvages with a nylon ribbon affixing the enterprise's label to the blanket.

F. Auxiliary Operations

Due to the nature of the visit to Debre Birhan Textile Factory, examination of the auxiliary operations relied mostly on brief observations and discussions with personnel. The plant had test equipment which was used to validate the major parameters used in water treatment, but the team did not measure ambient conditions.

F1. Water Supply and Treatment

The plant receives its water supply from the nearby river. Raw river water is received into a cement reservoir for settling. There are sand filtration tanks through which the water passed into a second reservoir, but these are currently bypassed due to insufficient capacity. During rainy weather the water becomes cloudy; this is alleviated by treating with aluminum sulfate, which causes the mud to settle.

The water was measured to have a hardness of 50-60 ppm. This is barely adequate for the dyeing requirements here, and should not be allowed to go any higher.

Sewage is passed through the equivalent of a septic tank. Dye house discharge is drained into a settling pool. The overflow of liquid of the sewage septic tank merges with the overflow liquid from the dyeing and finishing settling tank in a circular canal; these are discharged into the river. At the respective overflow points, the sewage discharge was measured to have a pH of 7.0, while the dyeing and finishing liquid showed a pH of 6.5.

F2. Boilers

Two Wanson boilers, of 1963 and 1979 vintages, supply the needs of this operation. Some scaling of boiler tubes is visible, which should be a major concern to management. The plant has a relatively new softener system for the supply to their boilers, yet our measurements indicated a hardness of about 30 ppm. This is sufficient to risk scaling of the boiler tubes, a very costly condition to fix. Therefore, it seems advisable for management to explore using a metered water treatment injection system for the boilers.

F3. Air Compressors

The plant has one compressor with a capacity of 2,000 cubic liters. It is adequate for current air requirements and is in good condition.

G. Conclusions and Recommendations

The blanket production business at Debre Birhan benefits from the technical competence of its production managers and from occupying a market niche that has no serious domestic or import competition. It clearly has substantial excess employment; so much so that reducing the number of workers would probably increase output.

Major technical recommendations include the following:

- Develop connections with suppliers of unbranded acrylic fiber; when desirable, use this acrylic as an alternative to the waste fiber now used for raw stock. The acrylic may often be cheaper and it would be a desirable end product in a country with the climate and living conditions of Ethiopia.
- Determine which machines will not be used in the foreseeable future and remove them from the plant. Perhaps some could be transferred to other enterprises or sold to private buyers.
- Explore alternatives (including local machine shops) to get the parts needed to repair the card that is out of service.
- Carefully examine ways of increasing throughput of the carding machines; it appears they may not be used efficiently. Consider buying additional cards only after existing ones are producing at capacity.
- Train spinning operators in the proper methods of end repair without stopping off an entire frame.
- Provide reserve shuttles for the carpet weaving machine and properly adjust the Jacquard harness on it.
- Replace missing panels in the suspended ceiling of the blanket weaving room.

- Repair and refurbish the edge cutters on the Saurer weaving machines.

- Adjust the package creel holders so they unwind well; also clean the heald wires more carefully.

- Explore the feasibility of repairing the two Saurer 250 looms that were damaged in shipment and putting them into production.

- Evaluate alternative techniques for raising the blanket fabric. It seems likely that the method suggested in this section will be less costly and produce a better product.

- Explore ways to improve control over temperature, exhaustion, and liquor ratios in the batch dyers.

- Try to find a method to use the sand filtering system for the water supply to capacity, mixing the filtered water with the necessary amount of unfiltered water in the second reserve tank. This will reduce contaminants now fed through the system.

- Thoroughly investigate alternative treatments for the boiler water, striking a proper compromise between the hardness and pH properties that serve the dual needs of dyeing and finishing while prolonging boiler life.

- Regularly monitor the hardness of the water supplied to the boiler on schedule. Even without using another treatment for boiler water, it is possible that the hardness problem may be adequately controlled by careful monitoring and adjustment.

- Monitor the quality of the discharge waste water. Since it is so near the river, it may impact both local residents and plant operations.

ANNEX M

TECHNICAL EVALUATION OF ADEI ABEBA TEXTILE FACTORY

PREVIOUS PAGE BLANK

ANNEX M
TECHNICAL EVALUATION OF ADEI ABEBA TEXTILE FACTORY

A. Introduction

The technical team visited the Adei Abeba Textile Factory on March 21, 1996, to perform a technical inspection of the plant. The manager of the operation has been in his position for a short time.

The factory is located in the Addis Ababa metropolitan area of Ethiopia. It was established approximately 30 years ago. This installation consists of two yarn manufacturing plants, a blanket weaving and finishing plant, and a small circular knitting plant with approximately 36 circular knitting machines capable of single and double knit constructions.

One yarn plant has older Marzoli equipment, and the other has Textima equipment. The blanket plant has some of the most modern looms, and some older conventional blanket looms equipped with dobby heads. Several 30-inch knitting machines, built by Orizio, have pattern wheel capability. There are also at least four flat or trim machines, so that the knitting plant is capable of producing complete sportswear programs.

The factory is obviously burdened by excess labor. Relatively few employees gave the impression that they were working in a purposeful manner. The grounds and production areas are disorganized and dirty.

B. Spinning Operations

B1. Fiber Preparation

The opening line in one plant was shut down due to mechanical failure. The main cause appeared to be damage to the air transport system. It was difficult to determine if any meaningful repair work was in progress. The belts on the evener cones of the pickers were badly worn. They are probably of little value in controlling the unit weight to be delivered by the opening line. Compounding the problem is the fact that the evener links' connecting chains are completely covered with lint and rust; they looked as if they would not be able to make the belt shifter move.

Several carding machines were inoperable; the reason given was a lack of parts. On some of those that did run, the flat belts had been removed so that the flats did not revolve. Damaged card wires were evident on all machines, and the flats had not been ground recently. Web appearance showed a high nep content.

An examination of the drawing frames revealed an almost total lack of cleaning. The drafting rolls were operated with worn cloth clearers; all the covers were raised.

In the rovin area, most of the spindles were idle, due to missing parts. Those operating were stopped excessively due to rovin breakage and poor maintenance.

B2. Ring Spinning

The general manager informed us that a technical visitor who had visited a few days before our team suggested discontinuing the use of some of the older (Marzoli) spinning machines and using them for spare parts. The rationale was that there was no money for parts, and no need for the production capacity they provided. The team suggested removing the cannibalized machines from the production floor and asset list if the advice was taken.

It was remarkable to see that about three-fourths of the spindles could not be run because of missing aprons, tensioning devices, rings, etc. Many partially filled bobbins of yarn were still sitting on positions where the spindles were no longer running.

C. Knitting

Knitting yarn is purchased from other operations. This relatively new part of the enterprise appears to have been set up appropriately. Attention was drawn to the large cylinder Orizio machines with pattern capability. An inquiry about the pattern wheels for these machines indicated that no one in the production area understood their use. After a lengthy explanation of their appearance, the staff retrieved them from a storage area. They had never been used.

Only four body width circular knitting machines were operating. These machines were refitted with Savio positive feeds; however, the stop motions on the positive feeds appeared to be inoperative. Many pots were missing on the guides to the needle bars.

One of the circular knitting machines had been stripped of its cylinder, and it was apparent that the plant technicians assumed that it was of little or no value. The bed of the machine was in excellent condition, however and the cam section screw ports looked like new. Therefore, the expensive part of the machine was sound and could be reactivated at relatively small expense. Indeed, it is not at all uncommon for cylinders to be replaced on machine beds simply to change the gauge of fabrics produced. However, it was troublesome that several other machines were in pieces with no evidence that they were being refitted.

D. Blanket Weaving

There is a section warper for producing warp beams for the blanket weaving looms. The machine is old and in need of repair, but it is adequate for the type of beams required. It would greatly benefit from an overhaul or replacement of the creel stop motion, which did not work at all. Tension weights varied too much, as did package sizes. The creel sides were wound fully in and were too close to the cone packages. The beam take off mandrel was worn excessively; correction could be made for this by brushing the beam spike socket.

There is a direct warper machine, used exclusively for preparing beams for the blanket stitching machines. Small beams of approximately 15 inches in diameter on a 6-inch barrel were produced. The stop motion was not working at all; it needed to be overhauled or replaced. The machine was not running due to a lack of raw material.

There are Galileo underpick looms and Saurer rapier machines used for blanket production. Of the 14 Galileo 4-box looms, 13 were running and one was stopped waiting for spare parts. These machines were old and well worn but workable. Only two of the four boxes were usable, but only two are required for the type of blanket being manufactured. Aluminum heald frames and reasonable wire healds with good eyes were being used. The reeds were acceptable.

The looms were operated by one weaver per loom; due to the nature of the loom, this is the maximum allocation. No weft stop or warp stop motions were fitted. The cloth produced was of acceptable quality for the intended market. The warp yarn sheets had many crossed ends, which should be corrected. However, it did not appear to seriously affect the performance of the machines.

Five Saurer SD 400 S rapier weaving machines, 1989 model, were commissioned in 1991. Two of them were inoperable, waiting for spare parts. The other three ran intermittently. These machines are quite appropriate for the blanket business; their speed is close to the maximum advisable for the coarse, low-twist weft yarn used in the blanket product.

On the Saurer machines, the main drive belts had failed prematurely due to an accumulation of dirt between the toothed belts and the special drive pulleys. It reveals a lack of cleaning and maintenance. It is a known tendency for these pulleys to wear to the point that the teeth will cut the belts.

Three blanket stitching machines are installed. Only two are run because the web preparation machinery is capable supplying only two. Due to a lack of polyester yarn, all of the machines were stopped during the team's visit. If it is true, as indicated, that the blankets produced on these machines are in great demand, priority should be given to maintaining a sufficient buffer stock of polyester yarn.

There is a condenser carding and spinning set used to produce weft yarn for the Galileo shuttle blanket weaving machines. Although old, it appeared to operate satisfactorily. The condenser yarn they produce is wound onto bobbins by using part of a box spinning machine.

A second condenser line is installed but not operating and would require a complete overhaul and repair to be operable again. If it were adequately repaired, however, it would be able to produce the weft yarn required for the rapier machines, which would provide an alternative to importing the yarn. If the weft it produced did not have sufficient twist for efficient operation of the rapier machines, the box spinning machines should be used as originally intended. There are three box spinning machines, of which only one side (i.e. one-sixth of capacity) was being used for winding.

There are various other fiber opening and processing machines installed, but many of them are inoperable. All should be investigated, and if not suitable for repair, they should be scrapped.

E. Dyeing and Finishing

There are seven winch rope dyeing machines used for knit fabrics:

- One with a capacity of 400 kg
- Two with a capacity of 125 kg each
- Two with a capacity of 200 kg each
- Two with a capacity of 250 kg each

Thus, the potential capacity of dyeing and bleaching knit fabric is 2500 kg per day. The dyeing winches could produce more but are restricted to the drying capacity. Two out of the four spreaders and calenders are operational but due to low productivity only one is being used.

The first step in processing knit fabrics is to weigh out the amount of fabric that has been ordered for a color to be dyed. The fabric is then reversed so that face of the fabric is on the inside. The fabric is loaded into the winch and then dyed. After dyeing, the fabric is extracted, reversed again, dried on a drum-type dryer, then put through a spreading device into a calendaring machine and rolled.

Reactive dyes are predominantly used for knits for the normal range of colors, along with a sulfur black dye when needed. These dyes have good wash and usually good light fastness.

Hanks of yarn for home weaving and knitting are bleached in a Mezzara cabinet-type unit, which has a capacity of 270 kg. Due to the limited yarn drying capacity, only 810 kg are bleached per day (three batches). The normal bleaching cycle is four hours using hydrogen peroxide.

A 100 kg kier is used to dye yarn on cones. There is also a raw stock carrier which may be used to bleach and dye yarn in hank form; with proper packing, it may also be used to dye garments.

There is also a small, dual-compartment, rotary garment dyeing machine. It may be used for either garment dyeing or stone washing woven fabrics. Two tumble dryers are available for drying garments.

One 250 kg kier is used for dyeing cotton and/or acrylic raw stock for the blankets. Direct dyes are used for cotton and basic dyes for acrylic fibers.

F. Quality Control

The limited equipment for testing fibers and yarns is generally not operational. It appears that the capability exists to size slivers and yarns and perform fiber strength tests with a Pressley instrument. The air conditioning system is not operational, so that even the fiber strength tests would not be reliable.

The color laboratory is managed by the quality control department. There is insufficient laboratory equipment for proper testing of the finished fabric and very little capability to establish new coloring and dyeing procedures. Equipment includes:

- An Ahiba AG skein dyeing unit suitable for laboratory samples; this is not operational due to lack of a heating element. Its general condition is poor.
- Sample dyeing winch used to check new dye recipes before going into production.
- Exhaust test dyeing machine similar to a jigger, which is used for checking recipes.
- Glass beakers over Bunsen burners are all that is used to develop new color recipes; no hot plates are available for heating the dye solution.

904

G. Water Supply and Treatment

Incoming water passes through a water treatment plant, providing softened water for dyeing and bleaching. Waste water goes down the drain untreated and is dumped into the Akaki river. This waste water has an alkaline pH and is quite colored with dyes. It no doubt adds greatly to the pollution of the river.

H. Conclusions and Recommendations

The spinning operations at Adei Abeba are among the worst in Ethiopia; it is rare to see such dilapidated equipment still being operated in a commercial context. Very little of the equipment is salvageable. The team's brief observations led to the conclusion that neither the knowledge nor the motivation existed among production personnel to maintain the spinning plant and equipment.

Technical potential is much better for both the knitting and blanket weaving operations. It is possible that these could become profit centers if the total operation is down-sized and close attention is given to training.

Major suggestions for improving the technical potential of the enterprise include the following:

- Execute a thorough clean-up of the plant; until this is done, little else can be accomplished.
- Stop all spinning equipment not needed for actual production demands. Use the good parts of the inoperable equipment to put other equipment in working condition. Remove scrapped machinery and equipment from production areas, equipment lists, and financial statements.
- Establish realistic preventive maintenance programs and enforce them.
- Begin a definitive program to eliminate excess labor; this situation is especially critical at Adei Abeba.
- The small knitting operation, if not overloaded with excess labor and the liabilities of the larger operation, has good potential. Training in routine machine maintenance is needed. Also, the capability of this machinery to produce various garments styles needs to be exploited.

ANNEX N

TECHNICAL EVALUATION OF AKAKI TEXTILE FACTORY

PREVIOUS PAGE BLANK

ANNEX N
TECHNICAL EVALUATION OF AKAKI TEXTILE FACTORY

A. Introduction

The technical team visited the Akaki Textile Factory on February 28, 1996, to perform a technical inspection of the plant. The manager of the operation has been in his position for a short time.

The factory, located in the Addis Ababa metropolitan area of Ethiopia, was established approximately 40 years ago. This installation consists of two distinct operations on two different sites. One plant weaves basic cotton fabrics and has a small section for wool processing and blanket weaving. The other plant is a spinning and knitting operation; the knitting is devoted primarily to cotton socks.

The workforce at this has recently been reduced by about 800 people. Even so, the evidence of excess labor is among the greatest seen in Ethiopia.

B. Spinning Operations

B1. Fiber Preparation

In the opening line, the lack of cleaning and maintenance is obvious. The beater lags are badly bent and the evener belts show excess wear and lack of cleaning.

In the carding area, wire was badly damaged on several doffers and was probably caused by improper operator practices. On one card, a very pronounced waviness of the web was noted which is usually caused by a damaged licker-in. Cleaning of the flat, cylinder, and doffer wires was quite inadequate.

The size of sliver cans is rather small. The cards thus require frequent doffing and additional creeling. However, until the problem of excess labor is alleviated, there is no point in addressing this situation.

The drawing equipment is old and slow, but more important than its age and size is the lack of maintenance it receives. Covered rolls are not serviced on an adequate schedule.

There are six Whitin combing machines and a lap forming machine. Only two combers had any laps creeled, and these were not running. It was noted, however, that the wrong feed ratchet levers are installed on the combing machines.

In the rovin area, cones were "jumping," probably due to bad bearings. Cone belts were badly frayed. These are symptoms of very poor maintenance.

The drafting system on the rovin machines is the latest design available. If they were properly maintained, they would perform well. In particular, the top drafting rolls need service.

B2. Ring Spinning

Many spinning frames were not operated due to a lack of fiber. However, several could not be operated because the vacuum collector fans and motor units had been removed. On some others, the main drive motors had been removed.

The spinning frames are equipped with the latest in drafting system technology, which appears to have been set appropriately. Problems observed included the following:

- The top rolls appear to be undersized and in poor condition.
- The overhead cleaners were parked on the tracks at one end of the frames.
- The travelers run were much too light, yielding a spongy bobbin package (and no doubt increasing the number of ends down).
- It was common to see the ends of the rovin drawn around the top arm instead of run through the rovin trumpets. This will cause significant variations in yarn size and should not be allowed by management.

C. Weaving

Uneven loom beams were observed; this appeared to be caused primarily by variations of the tension disc used in the yarn supply creel. The beam head lacked normal servicing, which will cause snagged yarns on the selvages, resulting in increased slasher stops and, eventually, loom stops and reduced fabric quality,

On the slashing unit, indicators for input speed, output speed, and the moisture condition of the sheet were not working. A hand inspection of the output sheet revealed that very little sizing was applied. This will preclude good weaving performance.

The products that can be made on the cotton looms are too narrow for most of today's markets and of a quality that is largely unacceptable even in the domestic market. The machines and products are more akin to motorized hand loom production in their uneven construction and varied texture. Perhaps the only way to keep them in production is to market the fabric as a rustic textile. Perhaps the weaving at Akaki could be transformed into a collection of craft weavers producing "African textiles." The operation would have to be down-sized substantially, but it might preclude total closure.

D. Sock Knitting

Only about one-third of the machines in this plant is currently operational. This was due mostly to missing or damaged parts such as cams, needles, etc. The work area was in total disarray. Although some socks looked good, it was sometimes difficult to determine which were for sorting and which were for scrap. Nevertheless,With management effort and relatively minor expenditure, this small part of the operation could be brought into a state of technical efficiency.

E. Dyeing and Finishing

The squeeze rolls of the extractor were so badly grooved that they are of little use. The cause of the excessive grooving is the removal of the traversing mechanism that shifts the fabric's position. Discussions with personnel revealed that they did not know what this mechanism did.

There is a rotary printer. Visible problems at this stage of the printing process were largely due to prior problems with fabric preparation. Normally, this fabric is best finished on a pin tenter frame to present a relatively flat, unwrinkled fabric to the printer. This was not being done, resulting in unprinted sections on the straightened fabric.

There is a pad batch dyeing machine. After the rolls are doffed from this machine, they are not rotated during drying. This causes erratic dye shades throughout the length of the roll.

There was a large pile of loose unrolled fabrics in a room adjoining the dye house. The explanation was that all the fabric warehouses were full, so this space was used for greige fabric storage. Further discussion revealed that there was no system to inventory these fabrics; therefore, it would be impossible to ensure that dyeing the greige fabric could be undertaken in a systematic, sequential fashion. This is yet another source of shading differences in dyeing.

F. Boilers

There are three boilers, but only two are currently in operation. It was explained that the third one was unusable due to bad tubing in the heat exchanger and that installing new tubing was not feasible because a qualified welder was not available to attach the joints at the ends of the tube sections. However, it only requires one certified person to oversee installation. (He does not have to do the welding.) Therefore, repair of this type should be a viable option.

Inadequate water treatment is the most likely cause for the failure of the tubes of the exchanger. If so, the tube on the other boilers will likely fail soon.

Pressure gauges indicated that the operating pressure of the boilers is quite low. Perhaps the gauges are incorrect, or perhaps the pressure is intentionally kept low because of concern about the tubes. If the pressure is actually as low as indicated, the cost of dyes and chemicals is probably increased significantly.

G. Conclusions and Recommendations

The spinning operations at Akaki are among the worst in Ethiopia; cannibalization of parts has reached an advanced stage. Management would only do this if it expected the machinery to be replaced. When combined with the fact that the dyeing and finishing equipment is too narrow and not in good condition, the technical condition of this factory appears terminal.

The enterprise can improve its technical potential by:

- Executing a thorough clean-up of the plant; remove scrap equipment.

- Attending to obvious items of maintenance, cleaning the lags on the beaters of the pickers; cleaning the card flats; installing travelers and top rolls of the proper weights and sizes; installing a traversing mechanism on the extractor and keeping the rolls properly ground; installing the correct feed ratchet levers on the combing machines; replacing and maintaining bearings, etc. If operation is to continue, a realistic preventive maintenance program must be established and enforced.

- Beginning a definitive program to eliminate excess labor. This situation is especially critical at Akaki.

- Keeping the fabric properly registered so that wrinkles do not result in unprinted surfaces.

- Cleaning and organizing the sock knitting area.

- Exploring alternatives for repairing tubing in the boilers and for treating the water to avoid further tube damage. The proper operating pressures should be maintained.

ANNEX O

TECHNICAL EVALUATION OF EDGET YARN FACTORY

ANNEX O
TECHNICAL EVALUATION OF EDGET YARN FACTORY

A. Introduction

The technical team visited the Edget Yarn Factory on March 1, 1996, to perform a technical inspection of the plant. At that time, no one occupied the general manager position. On a brief follow-up visit (May 20, 1996), a newly appointed manager was there.

This thread yarn factory, located in Addis Ababa, was established in 1953. Although the factory had recently been commissioned with new equipment, the finishing equipment used 1950s technology. Furthermore, most thread yarn factories in the United States and Europe have not used winding and twisting equipment such as that used in this plant since the early 1960's. This is no doubt due to the fact that the Edget plant was designed and set up by experts from the People's Republic of China, which explains why this integrated thread production facility also has a functioning cotton gin.

This enterprise clearly cannot aspire to being a viable thread yarn plant until it can access a raw stock supply of cotton or other fibers that provides adequate fiber strength to make quality sewing thread. On the second visit to this plant, the new manager showed some experimental threads made from a poly/cotton blend and from 100 percent polyester. Breaking strength of these appears to be adequate, but yarn finishes must be found that are suitable for higher speed sewing machines.

This operation also needs spinning machinery that can process a core yarn. This is now the global standard for sewing thread yarn.

The plant's very limited production is shipped as skeins for the home market. Therefore, other than an overview of the amount and type of equipment available, there is little to report about dyeing and finishing.

B. Spinning Operations

B1. Fiber Preparation

The opening line is built around a Hergeth system of current design. Three opening hoppers with extended feed tables supply two pickers. The fiber then goes to nine new Crosrol cards, where some damage to items such as clean-out doors is already apparent. The web and sliver appearances suggest the need for minor setting changes or other adjustments.

The vacuum system for waste removal at the cards does not operate efficiently. Without taking instrument readings, it cannot be known for sure whether this is a system design or a cleaning problem.

The drawing frames are some of the newest to be found in Ethiopia, yet they are not equipped with autoleveling for the drafting. Of the nine frames, seven are practically brand new

Toyoto/Mearibeni frames. Two are older Marzoli frames; one of each is on the breaker and finisher lines.

The Toyoto frames use a 5-over-4 drafting system, which is normally adequate for cotton and most other shorter staple fibers. It could be a problem if medium length polyester were processed. One of these frames is assigned to a pre-combing process, three are assigned to the breaker drawing process, and three to the finisher drawing process.

There is a Toyoto lap former in the department that is not used, since combed stock is not run at this time. The machine appears in very good condition and could be easily returned to production.

Three Toyota combing machines of eight positions each are out of service and covered up. They appear to be in good running order; if the plant is going to make cotton thread yarn successfully, it will need to operate this combing equipment.

There are five older model Marzoli roving frames that have been equipped with the latest model SKF drafting. They are quite capable of producing an adequate quality of rovin for this plant. Maintenance appears to be satisfactory.

B2. Ring Spinning

There are a total of 27 seven Toyota/Mariebeanni spinning frames in this department. Five have been taken out of production due to lack of sales. They apparently could be returned to production without serious problems.

All spinning frames are equipped with the latest model drafting system available which uses the spring-weighted top arm. It is a Duo Roth design with a double apron, middle roll type system. Maintenance needs some improvement; this did occur between the two visits made to the factory.

B3. Winding, Twisting, and Reeling

There are 13 manual winders which are Chinese copies of the old Lesson model 44 winder. These were not being used, since all spinning production is going directly to the reels.

There are several assembly winders which are adequate to supply the twisters when they are operated. The team observed a very limited amount of yarn wound on only one of these.

All the twisting capacity for this plant is ring twisting. There are a total of 13 units in the plant with only one in operation.

There are 28 reel units to make hanks of yarn for the home market. All of them were observed in production. They appeared to be operating fairly well and to be in good condition mechanically.

C. Dyeing and Finishing

The plant has capability to scour, bleach, and mercerize yarns, dye hanks, and cones. Major equipment includes:

- **Scouring.** One pressure horizontal kier, 1000 kg capacity.

- **Bleaching.** Two bleaching kiers, 200 to 300 kg capacity each.

- **Mercerizing.** Four hank mercerizing machines, 27 kg capacity each.

- **Rinsing and neutralizing.** Two circulating machines for rinsing and neutralizing bleached and mercerized yarn and for applying optical brightener to bleached yarn.

- **Dyeing.** Five pressurized kiers to dye cones (packages) and hanks and one drier, 50 kg capacity each (with microcomputer controllers); three rotating arm dye machines, 50 kg capacity; one sample rotating arm dye machine; two centrifuge extractors; and a continuous hank drier with controls to maintain temperature and moisture regain of the yarn.

Types of dyes used include reactive, vat, and naphthol (azoic).

The finishing operation appears to be well run but has a very small capacity and is greatly under-used. The Kier package dyeing units is capable of dyeing (1) 100 percent polyester yarns, (2) 100 percent cotton and cotton/poly blends of yarns (which could be used for knit fabrics and weaving of multicolor patterns), and (3) such yarn as is used in sock production at the Akaki Textile Factory. It is questionable, however, whether Edget has the machines and knowledge to wind filament yarn onto dye tubes, then back onto knitting cones.

The winding equipment used to wind the finished thread for the customer's package is a copy of the old Universal Model 50. Although it is somewhat dated and labor intensive compared with modern units used by state-of-the-art thread producers in the free world, it is capable of producing good packages.

It is to management's credit that Edget is experimenting with adding hot waxing or finish application boxes to these winders. This will likely be necessary for success in this market. In addition to this finish application, it is also necessary to evaluate the operational procedures in scouring and dyeing for compatibly with the finishes applied. There is a definite interrelationship between these that impacts processing and product performance.

D. Conclusions and Recommendations

This is a factory that, from a technical standpoint, can face the challenges of the future. It is a low capacity, labor intensive plant; nevertheless, it can deliver adequate quality. It must solve its raw material limitations and target its markets well. Since it is a relatively small-scale operation, it must also pare down its employment to a profitable level.

Necessary steps should be taken to correct the vacuum problem at the cards, not only to improve quality, but to prevent damage to the card by pulling clumps of trash into it. Consideration should be given to using chute fed cards rather than using laps to feed into them. This is not a large expenditure, assuming that a way can be found to use the spinning capacity.

Management should try to put the combers and related equipment back into service. They will need to run trials to determine the appropriate production process for the types and qualities of yarns needed.

ANNEX P

TECHNICAL EVALUATION OF NEFAS SILK SEWING THREAD FACTORY

PREVIOUS PAGE BLANK

ANNEX P
TECHNICAL EVALUATION OF NEFAS SILK SEWING THREAD FACTORY

A. Introduction

The technical team visited the Nefas Silk Sewing Thread Factory on March 1, 1996, to perform a technical inspection of the plant. The general manager had moved into this position after others had left, so he had over a decade of experience with this small enterprise. He exhibited a strong desire to build outlets in local markets, and understood that finding them would be necessary for Nefas' survival.

This factory, located in Addis Ababa, was established in 1966. It has the distinction of being the smallest of all public sector textile enterprises. Nevertheless, its excess labor is on a par with the other public sector enterprises.

Nefas is equipped only to finish yarns in hank form by scouring, bleaching, and dyeing. The equipment is very old; the only recent capital investment of any significance has been for local construction of skein reeling frames. The enterprise must currently buy all its yarns from other public sector textile factories in Ethiopia.

B. Observations

The plant and equipment are old and generally in fair-to-poor condition. The plant and grounds are disorganized and unkept, with dirty and poorly lit work areas. Outside, where the caustic soda is stored and the mercerizing solution is made, conditions appeared to be dangerously polluted.

It was impressive, therefore, to see the quality of the products, which was perhaps better than any other competing products in the public sector. It is a testament to the general manager's emphasis on satisfying customers in the local market.

Normal scouring, bleaching, mercerizing, and dyeing formulas are used, with much adjustment for machinery problems. For example:

- The dye machines leak at some weld seams; these reportedly cannot be repaired because no one in Addis can repair stainless steel.

- The temperature of the hank drying boxes cannot be controlled and the maximum temperature that can be achieved is 75°C. Insulation is poor, and air leaks significantly. The workers have learned to compensate by leaving the yarn in the drier longer.

Dyeing and finishing equipment include:

- Two mercerizing units, with 25 kg capacity each.

- One hank rinsing and neutralizing machine.

- One scouring and bleaching machine, with 167 kg capacity.

- Three Mezzera cabinet-type hank dyeing machines, two with 65 kg capacity and one with 160 kg capacity. The 160 kg machine may also be used for scouring and bleaching up to 167 kg of yarn.

- One centrifuge extractor.

- Two box driers.

There are also some dilapidated heat setting or texturizing machines. The electrical controls are in such a state of disrepair that they should be considered safety hazards.

Classes of dyes used include reactive, vat, and naphthol (azoic) types. This range of dyestuff is normally adequate to cover fiber and color range for an operation such as this.

D. Conclusions and Recommendations

Considering the observed quality of yarns used, along with the equipment and work conditions, this factory is producing a surprisingly good quality product. The excess labor should be used to do a major clean-up of the plant, equipment, and grounds. The labor force needs to be reduced, no less here than in the larger public sector textile enterprises.

We also recommend:

- A better lighting system installed in the work areas.

- Repairs to the steam cabinet and its regulators to improve quality and conserve energy use.

- Better storage and management of the caustic soda. Use older containers first to reduce losses of material caused by damaged containers.

Current management's pursuit of specialty yarn markets (which include synthetic as well as cotton yarns) is a commendable strategy. To succeed, the enterprise needs the freedom and the means to source from domestic and foreign suppliers.

ANNEX Q

MEETINGS AND PLANT VISITS

41

ANNEX Q
MEETINGS AND PLANT VISITS

A. Fiber Team

March 6, 1996
Martin Hanratty, Agricultural Development Officer
USAID/Ethiopia

March 6, 1996
Meeting with Task Force Fiber Team
Industrial Project Services
Addis Ababa

March 7, 1996
Modo Edible Oil Complex
Addis Ababa

March 8, 1996
Salish Zeleke, General Manager
North Omo Agricultural Development Enterprise
Addis Ababa

March 8, 1996
Shoa Ginnery
Addis Ababa

March 11-14, 1996
Farm Visit
North Omo Agricultural Development Enterprise
Arba Minch

March 13, 1996
Gin Visit
North Omo Agricultural Development Enterprise
Arba Minch

March 18-20, 1996
Farm Visit
Middle Awash Agricultural Development Enterprise
Middle Awash

March 18, 1996
Gin Visit
Middle Awash Agricultural Development Enterprise
Middle Awash Farm

April 2, 1996
Mamo Teferi, General Manager
Tendaho Agricultural Development Enterprise

B. Finance Team

February 19, 1996
Dr. Dembel Balcha, Senior Economist
Shawel Consult International
Addis Ababa

February 21, 1996
Beshah Azmite, General Manager
Ethiopian Privatization Agency
Addis Ababa

February 22, 1996
Mogus Chemere, General Manager
Ethiopian Development Bank (EDB)
Addis Ababa

February 23, 1996
Assefa Abraha, Minister-Head
Public Enterprise Supervisory Authority
Addis Ababa

February 23, 1996
Orientation
Government Task Force-Finance Team
Addis Ababa

February 26, 1996
In-country Orientation Meeting
Ethiopia Management Institute
Debre Zeyit

February 27, 1996
General Task Force Meeting
PESA Office
Addis Ababa

February 27, 1996
Meeting with Finance Task Force
Ato Mesfin
IPS Office, Addis Ababa

February 28, 1996
Tour of Factory
Alemayehu Tafesse, General Manager
Akaki Textile Factory

February 29, 1996
Darge Berkessa, Acting Manager for Industrial Department
Development Bank of Ethiopia
Addis Ababa

February 29, 1996
Nasser Hassen, Deputy General Manager
Commercial Bank of Ethiopia
Addis Ababa

March 1, 1996
Amerga Kassa, Deputy General Manager
Awash International Bank - private bank
Addis Ababa

March 5, 1996
Ato Hamza, Acting General Manager
Dire Dawa Textile Factory

March 5-7, 1996
Eshetu Hailu, Acting Finance Director
Dire Dawa Textile Factory

March 21, 1996
Mulugeta Sebsibie, General Manager
Adei Abeba Yarn Factory

March 21, 1996
Hailu Wodago, Acting Finance Director
Adei Abeba Yarn Factory

C. Technical Team

February 26, 1996
In-country Orientation Meeting
Ethiopia Management Institute
Debre Zeyit

February 27, 1996
General Task Force Meeting
PESA Office
Addis Ababa

February 28, 1996
Plant Visit
Akaki Textile Factory

March 1, 1996
Plant Visit
Edget Yarn Factory

March 1, 1996
Plant Visit
Nefas Silk Sewing Thread Factory

March 4-7, 1996
Plant Visit
Dire Dawa Textile Factory

March 11-13, 1996
Plant Visit
Awasa Textile Factory

March 14-15, 1996
Plant Visit
Arba Minch Textile Factory

March 21, 1996
Plant Visit
Adei Abebe Yarn Factory
Addis Ababa

March 26-28,1996
Plant Visit (with finishing emphasis)
Kombolcha Textile Factory

April 8, 1996
Tom Smith, Sales Manager
Equipment Pricing and Specification
Platt, Saco, Lowell, Inc.
Greenville, South Carolina, USA

April 12, 1996
Joe Schitels
Lubrication Specialities
Harry Simons, ILE
Consultation with lubrication and engineering experts
Charlotte, South Carolina, USA

April 17, 1996
Shewafaraw Girma, Team Leader
Government Textile Sector Task Force
Addis Ababa

April 18, 1996
Plant Visit
Debre Berhan Blanket Factory

April 21-25, 1996
Plant Visit
Kombolcha Textile Factory

April 30-May 1, 1996
Plant Visit
Bahir Dar Textile Factory

May 2, 1996
Review of Interim Report
Marg Bonner, Mission Director
Bill Douglas, Program Officer
Martin Hanratty, Agricultural Development Officer
Meg Brown, Agricultural and Natural Resources Officer
Gezagn Kebede, Contracting Officer's Technical Representative
USAID/Ethiopia

May 5, 1996
Interim Report Review
Ethiopian Management Institute
Debre Zeyit

May 20, 1996
Plant Visit
Edget Yarn Factory

D. Economics and Marketing Team

February 26, 1996
In-country Orientation Meeting
Ethiopia Management Institute
Debre Zeyit

February 27, 1996
General Task Force Meeting
PESA Office
Addis Ababa

February 28, 1996
Getu Gelete, General Manager
Masresha Selassie, Commercial Manager
Get-As International
Addis Ababa

February 28, 1996
Suresh Oza, Owner
New Commercial Ltd.
Addis Ababa

February 29, 1996
Mulugeta Sebsibis, General Manager
Mohammed Surur, Commercial Manager
Alemu Tadesse, Research Director
Adei Abeba Yarn Factory
Addis Ababa

February 29, 1996
Eskinder Kidane
Cotton & Cotton
Addis Ababa

March 1, 1996
Ato Duguma
DH Geda
Addis Ababa

March 4, 1996
Berhane Mewa
EPIA

March 4, 1996
Ben Barden
TDI
Addis Ababa

March 4, 1996
Alemayehu Tafesse, General Manager
Akaki Textile Factory

March 5-6
Hamza Ibrahim, General Manager
Getachew Sileshi, Commercial Manager
Dire Dawa Textile Factory
Dire Dawa

March 7, 1996
Field Interviews
Harar clothing salvage market
Harar

March 7, 1996
Tashome Kebede
Genuine Leather
Addis Ababa

March 8, 1996
Christine Sefou, General Manager
Universal Leather Factory

March 9, 1996
Ato Beyene
Ministry of Trade and Industry
Addis Ababa

March 11-13
Field Interviews
IGEDO
Dusseldorf, Germany

March 13, 1996
Manuel Lopez Blanco, Chief Commercial Officer
Maria Aleves, Ethiopia Desk Officer
European Union
Brussels, Belgium

March 14, 1996
Geoffrey Bartlett, Deputy Chief Trade Development Officer
European Union
Brussels, Belgium

March 15, 1996
Major Donovan
Salvation Army
Baltimore, Maryland

March 15, 1996
John McCormack
Catholic Charities
Baltimore, Maryland

May 2, 1996
Review of Interim Report
Marg Bonner, Mission Director
Walter North, Deputy Mission Director
Bill Douglas, Program Officer
Martin Hanratty, Agricultural Development Officer
Meg Brown, Agriculture and Natural Resources Officer
Gezagn Kebede, Contracting Officer's Technical Representative
USAID/Ethiopia

May 5, 1996
Review of Interim Report
Ethiopian Management Institute
Debre Zeyit

May 7, 1996
Hussien Ahmed
Komblocha Textile Factory

May 8, 1996
Bruce Bradford, President
BTB Trading Inc.

May 8, 1996
Mekonnen Legesse, General Manager
Awasa Textile Factory

May 9, 1996
Teketel Zegeye, General Manager
Yeromnesh Haile, Sales Manager
Bahir Dar Textile Factory

May 10, 1996
General Manager
Nazareth Garment Factory
Nazareth

May 10, 1996
Ermias Admassu, General Manager
Akaki Garment Factory

May 11, 1996
Danielle d'Epson, Designer
Epsom Cote d'Azur

May 11, 1996
Ato Brehane, President
EPIA

May 11,1996
Ato Beyene
Ministry of Trade and Industry

F. Garment Sector Team

February 19, 1996
Factory Visit
Addis Garment Factory

February 20, 1996
Factory Visit
Gulelie Garment Factory

February 21, 1996
Factory Visit
Wazema Garment Factory

February 21, 1996
Informational Interview
Ministry of Trade and Industry
Addis Ababa, Ethiopia

February 22, 1996
Factory Visit
Adei Ababa Garment Factory

February 23, 1996
Factory Visit
Nazareth Garment Factory

February 24, 1996
Factory Visit
Akaki Garment Factory

February 26, 1996
In-country Orientation Meeting
Ethiopia Management Institute
Debre Zeyit

February 27, 1996
General Task Force Meeting
PESA Office
Addis Ababa

E. Organization and Management Team

February 26, 1996
In-country Orientation Meeting
Ethiopia Management Institute
Debre Zeyit

February 27, 1996
General Task Force Meeting
PESA Office
Addis Ababa

March 10-15, 1996
Abdella Hassan, Board Member
Hamza Ibrahim, Acting General Manager
Mekonnen Tewolde, Acting Head of the Administration Department
Getachew Sileshi, Acting Head of the Commercial Department
Eshetu Hailu, Head of the Finance Department
Birhanu Sisay, Acting Head of the Production and Technical Department
Ermias Worede Work, Acting Head of Stores Administration Department
Bayou Wedaje, Labor Leader
Dire Dawa Textile Factory

April 1-5, 1996

Sultan Mohammed, Board Chairman
Mekonnen Legesse, General Manager
Mechal Berecha, Head of the Finance Department
Birhane Abebe, Acting Head of the Administration Department
Goshu Negash, Head of the Commercial Department
Henock Negash, Head of the Production and Technical Department
Atiku Bahiru, Labor Leader
Awasa Textile Factory

April 25-30, 1996

Fikru Desalegne, Board Chairman
Alemayehu Tafesse, Acting General Manager
Getachew Sahle, Head of the Administration Department
Tecle Tesfaye, Head of the Finance Department
Daniel Asmelash, Head of the Training and Manpower Development
Girma Deme, Labor Leader
Yeshineh Bitew, Labor Leader
Akaki Textile Factory

May 2-7, 1996

Lema Ibsa, Board Member
Bezabeh Demissie, General Manager
Ewnetu Wodaje, Head of the Administration Division
Tsehay Taye, Head of the Finance Division
Terefe Tadesse, Head of the Production & Technical Division
Wubishet G. Selassie, Head of the Commercial Division
Legesse Gurme, Labor Leader
Teshome Gutema, Labor Leader
Ato Kibur Liul, Labor Leader
Addis Garment Factory

May 5, 1996

Interim Report Review
Ethiopian Management Institute
Debre Zeyit

May 9-14, 1996

Mulugetta Sebsibe, General Manager
George U. Michael, Head of the Administration Department
Tesfaye H. Selassie and the remaining labor leader
Adei Abeba Yarn Factory

May 28-31, 1996

Tamirat Gabriel, Chairman of the Board
Mesfin Abebe, Acting General Manager and Head of Finance
Work Agegnehu Makonnen, Head of Production and Technical Departments
Feyisa Debele, Labor Leader
Haile Mariam T. Mariam, Labor Leader
Bayou Yigletu, Labor Leader

Feynalem Teshome, Acting Head of Administration
Nazareth Garment Factory

June 7-10, 1996
Tadele G. Sellassie, Chairman of the Board
Birhane G. Yohannes, General Manager

F. Team Leader

February 15, 1996
Meg Brown Agriculture and Natural Resources Officer
Martin Hanratty, Agricultural Development Officer
USAID/Ethiopia

February 15, 1996
Hailu Shawel, President
Shawel Consult International
Addis Ababa

February 15, 1996
Shewafaraw Girma, Team Leader
Government Textile Sector Task Force
Addis Ababa

February 19, 1996
Dr. Omar Fayez, Resident Representive
World Bank Resident Mission
Addis Ababa

February 23, 1996
Assefa Abraha, Minister
Public Enterprises Supervisory Authority
Addis Ababa

February 26, 1996
In-country Orientation Meeting
Ethiopia Management Institute
Debre Zeyit

February 27, 1996
General Task Force Meeting
PESA Office
Addis Ababa

March 11-13, 1996
Plant Visit
Awasa Textile Factory

May 2, 1996

Review of Interim Report
Marg Bonner, Mission Director
Walter North, Deputy Mission Director
Bill Douglas, Program Officer
Martin Hanratty, Agricultural Development Officer
Meg Brown, Agriculture and Natural Resources Officer
Gezagn Kebede, Contracting Officer's Technical Representative
USAID/Ethiopia

May 5, 1996

Interim Report Review
Ethiopian Management Institute
Debre Zeyit

May 20, 1996

Marg Bonner, Mission Director
Bill Douglas, Program Officer
Martin Hanratty, Agricultural Development Officer
Meg Brown, Agriculture and Natural Resources Officer
Gezagn Kebede, Contracting Officer's Technical Representative
USAID/Ethiopia

ANNEX R

QUESTIONNAIRE FOR ORGANIZATION AND MANAGEMENT ANALYSIS

415

ANNEX R
QUESTIONNAIRE FOR ORGANIZATION AND MANAGEMENT ANALYSIS

Name of the Factory/Farm: ____________________
Name of the Organizational unit: ____________________

1. What are the organizational problems that your unit presently faces?

2. What are the advantages and disadvantages of having an organizational structure such as yours?

3. Are the actual functions, responsibilities, and authority of your unit the same as those stipulated in the official organization and staffing manual? If no, please indicate the difference(s).

4. Does your unit face any internal and external coordination problem? If so, please describe the nature, cause and significance of the coordination problem that the unit faces.

5. Does the organization's information system provide timely and accurate management information?

6. Is the "management by exception principle" employed when preparing and issuing reports?

7. Does your unit face any communication (information flow) problems? If so, please specify the nature, cause, and significance of the communication problems that it faces.

8. How does management obtain the views, opinions, and suggestions of individual workers?

   Are there organization policies that encourage employees to express their views and recommendations both through the formal and informal communication channels?

9. Does your unit face any supervision and/or control problem? If so, please indicate the nature and significance of the problems faced.

10. Is the authority delegated to you adequate? Please discuss.

11. What are your authority limits with respect to:
    - procurement?
    - payment authorization?
    - hiring workers for, promoting employees within and firing people from your organizational unit?
    - training?

12. Are there any external bodies that unnecessarily interfere in your area of operation? Please indicate, if any.

13. Are there committees that impinge upon what you consider to be your proper area of operation and prerogatives as an executive? Please give details.

14. Have you delegated sufficient responsibility and authority to your subordinates? Why or why not?

15. How do you describe or characterize the style of management observed within the organization: open & democratic or closed and authoritarian?

16. Does your unit get adequate cooperation from other organizational units within your organization? Please elaborate.

17. Is the quantity and quality of the staff of your unit commensurate with the duties and responsibilities of your unit? If not, please indicate in detail the nature and causes for either the shortfall or the excess in manpower.

18. Is there a long-range personnel plan? If yes, (i) what does it cover, and (ii) how seriously is it pursued? If no, why not?

19. How are your subordinates selected/appointed?

20. Do you have any say in the selection/appointment of your subordinates? If so, please describe.

21. Do your subordinates have any say in the selection or appointment of their respective subordinates?

22. If you were to directly decide all by yourself without any external pressure, how many of your current direct subordinates would you fire? Why?

23. How do you assess the managerial capability of your subordinates?

24. Are there regular and ongoing training programmes? If so, in what areas?

25. Is performance evaluation regularly undertaken? How often?
What type of performance evaluation, the subjective or the objective type?
Are outcomes of the performance evaluation communicated to employees?
For what purpose(s) are the results of the performance evaluation used?

26. Is potential assessment undertaken?

27. Is there a need for a management training programme for employees within your organizational unit? If so, please specify the type, nature and duration of the courses required.

28. Is there an industrial tradition or culture that you believe is unique to your organization? Please elaborate.

29. How do you view the attitude of your organization's employees towards the organization, in general, and towards the organization's objective, policies, programmes, rules, and modus operandi, in particular? Please discuss.

30. Is there a healthy interaction between management and labor, and among the various groups of employees? Why or why not?

31. Does the spirit of collaboration, teamwork, and cooperation exist within the organization?

32. Is there a healthy working atmosphere and a favorable organization climate within the organization?
Is there a conducive working environment? Please elaborate.

33. How do you assess the relationship between management and the labor union?

34. Is there a sound basis and mechanism for conflict resolutions?

35. Are employees of this organization favorably disposed towards changes and improvements? Please provide relevant cases or instances.

36. Are there company objectives that (i) are stated in writing, and (ii) are specific and measurable?

    What are the objectives of the organization?

    Does the organization also have in writing and measurable terms departmental objectives for each functional area?

    Do you feel that all employees clearly know the objective(s) of the organization?

37. Is there a harmony between the objectives of the organization and that of employees? In what areas do the two coincide and in which area do they diverge?

38. What would you say are the prime expectations of employees from the organization? Can these expectations be fulfilled by the organization? Why or why not?

39. Do many employees leave the organization of their own free will? If so, why?

40. Is the top management respected by workers?

41. Please specify the problems, weaknesses, and/or drawbacks faced by your unit in the area of:
    41.1 Activity planning and programming
    41.2 Plan/programme execution:
    41.3 Plan/programme coordination:
    41.4 Plan/programme supervision, monitoring and control:

42. Are the plans and programme of the organization compatible with the objective(s) of the organization?

43. How are plans & programmes communicated to workers?

44. Is there a formal appraisal of management performance against plans?

45. Please discuss the problems, if any, emanating from:
    45.1 Existing laws and Government regulations/policies:
    45.2 Your organization's policies, rules, regulations, and procedures:
    45.3 The actions and reactions of your organization's competitors:

46. Are there adequate manuals that cover the policies, rules, regulations, methods, systems, modus operandi, forms, and formats applicable to all areas of operation within your organizational units? If not, please indicate the deficiencies.

47. Are the policies, rules, regulations, and systems of the organization compatible with the objective(s) of the organization?

48. Do the job descriptions issued to employees adequately indicate the duties, responsibilities, and authority of all employees?

49. Is there a properly formulated and consistently implemented salary scale?

    Any comment on the presently employed salary scale and other remuneration & benefit schemes?

50. Is your unit's capability/potential fully utilized at the moment? Please discuss.

51. What are the strengths of your unit?

52. What are the weaknesses of your unit?

53. Is undue emphasis given to any function or organizational unit at the expense of others or to the detriment of the whole?

54. What are the threats and opportunities presently faced by the organization as a whole?

    Do you believe that adequate strategies that are in line with these threats and opportunities are now in place?

    What are these strategies? Please discuss.

55. Are there specific market segments to which the organization caters? If yes, what segment? If no, why not?

56. Are the organization's products preferred by its customers? Why or why not?

57. How do you assess the tenure security of the management staff?

58. Any other comment or information?