



International Science and Technology Institute, Inc.

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SOMALIA,
THE FOUNDRY AND MECHANICAL WORKSHOP:
OPTIONS FOR SURVIVAL

FINAL REPORT

Prepared for:
U.S. Agency for International Development
Mogadishu, Somalia

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PREFACE

The Government of the Somali Democratic Republic (GSDR) has, in principle, decided that a number of state-owned enterprises should be transferred to the private sector.

The purpose of this study is to evaluate one of these enterprises, the Foundry and Mechanical Workshop (FMW), and determine whether this enterprise is a suitable candidate for privatization.

The study was commissioned by the United States Agency for International Development (USAID) mission to Somalia, and was conducted by the International Science and Technology Institute, Inc. (ISTI) Washington. USAID-Somalia financed the study as part of its Policy Initiative and Privatization Project, No. 649-0132.

A study team consisting of Mr. Jan-Hendrik van Leeuwen, Senior Economist, and Mr. Earl Sweet, Foundry Expert, visited Somalia to conduct field work during the period August 14 - September 11, 1985.

For professional assistance in its field work and provision of logistical support, the team subcontracted with two Somali consulting firms, the Somali Unit for Research on Emergencies and Rural Development (SURERD) and Somalresearch, who provided Somali researchers including two accountants, two economists, and a social scientist; these were Mr. Hussein Sheikh Omar, Mr. Abdurahman Ahmed Yusuf, Mr. Ahmed Dalal Farah, Ms. Halima Abdullahi Sheikh Ali, Ms. Faisa Ahmed Jama, Mr. Mohamed Hassan Farah, Mr. Abdullahi Haji Ali. This team provided invaluable assistance in evaluating the accounting practices and financial statements of FMW, conducting a market survey, and providing general research assistance.

During the four-week period of field work, nearly 60 people were interviewed, including representatives from central government institutions, the Mogadishu municipality, multilateral agencies, other bilateral aid agencies, parastatal organizations, educational institutions, and private sector enterprises.

The work was greatly facilitated by the cooperation received from Mr. Mohamed Ali Dahir, General Manager of FMW, and members of his staff. Mr. Hirid, Permanent Secretary of the Ministry of Industry and Commerce, kindly provided an official letter of authorization.

The team subcontracted with the accounting firm of Alexander Grant and Co. Washington, D.C., for an analysis of the degree to which FMW's financial statements would have to be adopted due to the highly inflationary nature of the Somali economy, in particular to make them relevant to a potential U.S. investor. Their report is included as Appendix V.

Mr. Jan-Hendrik van Leeuwen collaborated with Ms. Micheline Mescher, Economic and Financial Consultant of Mescher Associates, Alexandria, VA, to perform the analysis and write the final report in Washington, D.C. during the period September 19 - October 16, 1985. Ms. Mescher was involved in the formulation of the original project proposal that led to this study.

The study is divided into two major parts. The first part contains the main report, which is presented in four sections describing the major findings. The second part consists of five appendices that describe the analyses performed in greater detail. The team opted for this approach to keep the main report as short as possible and to make it suitable for wider dissemination.

The members of the ISTI team take this opportunity to express their appreciation to all officials of the GSDR, USAID, other official agencies, and all representatives from public and private sector enterprises who gave generously of their time to supply us with data for this report. The team hopes that the report will contribute a useful alternative solution to the current debate over privatization of state-owned enterprises.

Washington, D.C., February, 1986

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SUMMARY

Over the past two decades, the Government of the Somali Democratic Republic (GSDR) has created 13 state-owned manufacturing enterprises as part of a program to spur the country's industrial development. So far, the performance of these enterprises has been disappointing. Chronic under-utilization of capacity and continuing dependence on outside funds and expertise are endemic throughout the sector. Instead of contributing to the national budget, the parastatals have become a financial burden on the country's worsening economy.

For the past ten years, Somalia has experienced increasing economic difficulties. To reverse the steadily declining economic situation, GSDR, in conjunction with the International Monetary Fund (IMF), has formulated a number of economic policies. Prominent among these is an effort to restructure the parastatal sector. A number of state-owned enterprises have been targeted as potential candidates for privatization, including the Foundry and Mechanical Workshop (FMW) in Mogadishu.

Based on its performance so far, FMW currently does not represent an attractive opportunity for a private investor. The task at hand is to determine whether and under what conditions FMW can become a viable, profit-making enterprise, and whether and under what conditions ownership of FMW should be transferred from the public to the private sector.

We have analyzed FMW's market, cost structure, and human and technological resources, both within the framework of the actual conditions as they prevail in Somalia and the conditions that are expected to prevail in the next five years. Based on this analysis, we have come to the following conclusions:

- o FMW can become a viable, profit-making enterprise provided its management is completely restructured and its policies are overhauled. (See Section 1)

- o Under its current budgetary and political constraints, GSDR is unable to create and support the management structure needed for FMW to become profitable. (See Section 2)
- o The private sector is best equipped to supply FMW with the necessary profit-making incentives, management expertise, and singularity of purpose. (See Section 2)
- o Within the current political configuration in Somalia, outright privatization of a state-owned enterprise may not be a feasible option. (See Section 3)
- o As an interim solution, we suggest that the plant and equipment be leased to a private entrepreneur with an option for ownership transfer to be exercised at a future date. Meanwhile, the entrepreneur will be guaranteed complete freedom of action, thereby completely separating management of the firm from its ownership. (See Section 4)

SECTION 1 FMW, PAST, PRESENT, AND FUTURE PERFORMANCE

Past and Present

FMW was founded in 1975 with the objective of becoming the nucleus for the development of metallurgical and engineering industries in Somalia. At the outset, the firm was to produce simple castings, machined parts, and steel structures. In a second development phase, it was to manufacture progressively more complex items to substitute for imports, eventually to become the supplier to an indigenous machine industry.

Equipment was installed with an annual output capacity of 450 MT assuming a one-shift operation. An annual output of 1500 MT with a two-shift operation was anticipated, but remains unrealized.

FMW-published output figures for the first 10 years of operation range from 25 MT in 1975 to a high of 203 MT, achieved in 1982. By 1984, output had declined to 138 MT, but FMW nevertheless reported it was self-supporting and still profitable. (See Exhibit 1 for selected 1980-84 performance figures as reported by FMW.)

Based on our findings and analysis, these figures do not represent likely performance, since the following observations can be made:

Capacity Utilization. FMW, we estimate, is currently operating at less than 20% capacity.

Inventory. The reported value of 1984 inventory of raw materials, work in progress, and finished goods exceeds the value of 1 1/2 years of sales. We estimate that FMW could only realize a fraction of this value if it were to sell its inventory.

Reported Profits. The reported income and profit figures are misleading as they include unrealized profits on unsold goods.

Depreciation. FMW has been "eating away its capital." Depreciation figures reflect 1975 prices without adjustment for inflation. If more realistic depreciation figures were used, its reported income and profits would be much lower.

No sufficiently reliable data were available to perform a break-even analysis, but it is extremely unlikely that FMW generated any profits at the

EXHIBIT 1:

SELECTED PERFORMANCE FIGURES OF FMW FOR 1980-1984¹
(in 000's Somali shillings)

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
Total Sales	4,870	4,395	6,521	5,224	8,842
Capacity Utilization (%) (one shift)	27	16	45	30	30
Total Reported Profit	1,492	1,692	5,523	1,553	983
Inventory	4,509	N.A.	11,734	14,315	14,732
Inventory as % of Sales	92	--	180	274	167

¹ Source: FMW's Financial Statements.

capacity utilization rates of the past 5 years. At current operating levels, it is questionable whether the company can survive without outside financial support.

Proposed Changes

A dramatic increase in operational activity is an essential condition to achieve profitability and financial independence. In light of this requirement, we evaluated the firm's technical and management expertise, product policy, and plant and equipment. This evaluation has led us to the following conclusions and recommendations:

Personnel Policy. The most serious obstacle to FMW's production growth is the lack of technical and management expertise. Accounting, cost control, inventory control, product costing and pricing procedures are seriously flawed. As a result, management must operate on the basis of insufficient and often inaccurate data. There is inadequate technical know-how in such crucial areas as tool and manufacturing engineering, technical drafting, preventive maintenance, quality control, and production supervision.

Grossly inadequate salaries are at the root of these problems. Currently, FMW pays an average monthly wage of SS 2,000, only a fraction of the amount needed for a wage earner to meet basic living expenses. Consequently, FMW has been unable to train and retain a motivated workforce. We recommend a radically revised salary policy as crucial to solving the problem.

Lack of expertise is endemic to the country as a whole: Somalia is in the grip of a crippling brain drain. Qualified managers and technicians look abroad for work; in 1984, an estimated 100,000 Somalis were working abroad, compared to a domestic non-agricultural labor force of 190,000 people.¹

¹ Source: "The Private Manufacturing Sector in Somalia." German Development Institute. Berlin. Sept. 1984.

Furthermore, insufficient education facilities limit the number of qualified people available (as recently as 1977, Somalia had only four fully qualified accountants¹).

We recommend that, at first, FMW hire 3 expatriates for the positions of General Manager, Chief Engineer, and Chief Accountant, positions for which the supply of well educated and experienced Somalis is at present limited. We expect that after 3 or 4 years these expatriates will be replaced by domestic professionals either internally trained or hired from among the migrant professionals enticed to repatriate by the new salary structure.

The domestic supply of trained technicians is likely to increase with the opening of the Industrial Vocational Training Center in Mogadishu, organized and staffed by West German engineers. We recommend that FMW participate in this training program by placing, each year, five new paid trainees at this institute. (For a detailed analysis of personnel issues together with staffing and payroll recommendations see Appendix I.)

Product Policy. Presently, FMW's price list shows 60 products that span 20 different categories. Few of these have ever been manufactured in mass quantities. As a result, FMW has not acquired the manufacturing know-how required to turn out a product in significant quantities at an acceptable and consistent quality.

Notwithstanding its lack of know-how, the company has added several products to its line that demand a considerable amount of technological expertise to produce, yet FMW is unable to fulfill an order for simple metal castings.

¹ U.N. Conference on the Least Developed Countries. 1981.

We recommend that FMW concentrate on a relatively small number of products that can be produced and sold in large quantities. At the outset, a reasonable product line, one that we have used for our performance projections, for the foundry would include cast iron stoves, corn grinders, certain handtools, and stove grates. The metal workshop should concentrate on the manufacturing and repair of animal-drawn implements, handtools, garbage containers, water and fuel tanks. The machinshop should concentrate on machining parts and products for the foundry and metal workshop. At first, FMW should take on only a limited amount of custom orders; as its manufacturing know how increases, it could gradually expand to manufacturing more complicated custom products.

A product policy of this nature needs to be supported by a targeted marketing policy. At present, FMW has no marketing expertise; it does not employ salespeople or manufacturing representatives. The firm has one outlet, located at the plant, for its consumer products; it offers limited access to the public. Potential customers generally do not know about FMW, further indication of the dysfunctional, inward-looking attitude that needs to be reversed so that a market orientation prevails. Appointing a marketing manager and hiring salespeople are first steps towards remedying the situation.

Plant and Equipment Policy. FMW's operations are divided over 3 different areas: foundry, metal workshop, and machinshop. The foundry and the metal workshop share the same building; the machinshop occupies its own building. A third building contains a testing laboratory and general office space. The current (Aug., 1985) value of buildings and infrastructure (wall around the property, road, etc.) is approximately SS 30 million (\$355,000).

With the exception of the testing laboratory, the equipment is generally in good working condition and could support production several times greater than the current capacity utilization. The most significant shortcoming in

the equipment is the absence of a back-up power generator. Sole dependence on the erratic municipal electric power supply is a serious obstacle to increased production. To improve production flow and ensure increased activity, an estimated additional investment of SS 19.4 million (\$228,000) will be needed, including the following items:

- construction of a separate new building for the metal workshop (SS 2,125,000; US \$25,000)
- rehabilitation of the testing laboratory (SS 1,700,000; US \$20,000); and
- installation of a 300 kv power generator (SS 8,500,000; US \$100,000).

(For a comprehensive technical analysis of the plant's equipment and layout, together with detailed recommendations, see Appendix II.)

Projected Performance

If FMW were to implement the personnel, product policy, and equipment recommendations, a doubling of output within 1 year would be possible and the plant could operate close to capacity within 5 years. (See Exhibits 2 and 3. For a detailed market analysis together with the methodology and assumptions used, see Appendix III.)

The recent devaluation of the Somali shilling has opened a "window of opportunity" for export of Somali products. However, FMW would need a period of at least 3-4 years to develop the managerial and technical capability to mount a serious export effort. We therefore have not included any export figures in our projections.

In our scenario, projected operating expenses will exceed projected revenues in the first year, break-even level will be reached in year 2, and after tax profits will have increased to 14% of revenues by year 5. (See Exhibit 4. For a detailed analysis of the costs associated with the projected sales, see Appendix IV.)

EXHIBIT 2:

PROJECTED OUTPUT IN METRIC TONS

	Year 1	Year 2	Year 3	Year 4	Year 5
Cast Iron	73.0	102.0	127.8	138.8	150.8
Sheet Metal	61.0	78.0	100.0	128.5	142.5
HC Steel	2.2	3.5	5.8	5.8	5.8
Steel from Scrap	44.4	71.1	101.8	111.8	122.8
Aluminum	2.9	4.1	5.1	5.6	6.0
Copper	11.7	16.3	20.4	22.2	24.1
Total Weight of Production	195.2	274.9	360.9	412.7	452.0

EXHIBIT 3:

PROJECTED OUTPUT IN UNITS OF PRODUCTS

	Year 1	Year 2	Year 3	Year 4	Year 5
Kitchen stoves (set of 3)	3000	4000	5200	5200	5200
Garbage Containers	1	3	10	16	30
Animal-drawn implements	750	1200	2000	2000	2000
Corn Grinders	2000	2500	3000	3000	3000
Choppers/sickles	25000	40000	50000	60000	71000
Hoes, Spades, or Rakes	25000	40000	50000	60000	71000
Grates	5000	6000	7000	8000	9000
Water/Fuel Tanks	80	100	120	150	150

EXHIBIT 4:*

PRO FORMA INCOME STATEMENT FOR FMW--YEAR 1 TO YEAR 5
(in thousands of Somali shillings)

	Year 1	Year 2	Year 3	Year 4	Year 5
REVENUES	32013.71	52415.36	83609.57	107095.03	132113.86
OPERATING EXPENSES	32963.57	47452.56	64599.02	79829.45	99149.76
Labor	16614.00	20829.60	23184.36	24709.15	29050.48
Inputs	9946.83	16139.88	24692.75	33701.30	43676.51
Administration	1600.69	2620.77	4180.48	5354.75	6605.69
Miscellaneous	4802.06	7862.30	12541.44	16064.25	19817.08
OPERATING INCOME	-949.86	4962.81	19010.55	27265.57	32964.10
Interest expense	935.00	941.66	889.78	747.78	471.14
Depreciation	3880.00	3880.00	3880.00	3880.00	3880.00
GROSS INCOME	-5764.86	141.15	14240.77	22637.80	28612.96
Taxes	0.00	49.40	4984.27	7923.23	10014.53
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NET INCOME	-5764.86	91.74	9256.50	14714.57	18598.42
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Assumptions:

1. Year 1 is the first year of operation after the initial investment has been made.
2. Investment in new equipment and rehabilitation is SS 19.4 million.
3. No additional capital investment thereafter.
4. Interest expense is on a dollar denominated working capital loan and is adjusted for annual devaluation of the Somali shilling.
5. Initial investment is depreciated over 5 years, using the straight line method.
6. Income is taxed at 35%; tax loss is not carried forward.

NOTE: * The analysis was done on a Compaq micro computer using Lotus 1,2,3. Slight numerical discrepancies in the Exhibits are due to the fact that figures are rounded off and do not reflect any mathematical mistakes.

Essential to the smooth performance in FMW's first few years is a working capital balance of at least 3 months' operating expenses. Hence, an initial working capital of SS 8.5 million (\$100,000) is required. For the purpose of our analysis, this initial amount is treated as a 5-year loan. Internally generated funds are expected to provide for adequate working capital coverage in ensuing years. With an initial investment of SS 19.4 million in new plant and equipment, the present value of the projected income stream for the first 5 years, discounted at a constant rate of 10%, amounts to SS 36.4 million, yielding an internal rate of return of 32.1% (see Exhibit 5). By year 5 the value of FMW as expressed in the present value of the projected income stream for the following 5 years would reach SS 75.8 million assuming that for the years 6-10 the firm maintains an annual real income stream at least equal to that of year 5.

The pro forma net income statement of FMW over the first 5 years indicates a payback period of approximately 4 years, assuming the equipment is completely depreciated within 5 years. A slower depreciation schedule will shorten the payback period substantially.

Over the 5 years, the firm will have contributed SS 23 million in taxes and will employ up to 80 people, all presumably Somali by year 5.

A number of factors in the economic and political environment could strongly influence the outcome of our scenario. We make the following assumptions about these factors:

Inflation. Inflation rates in Somalia in recent years have been 30% or higher. In our analysis, we have applied an annual inflation rate of 25% assuming that the current efforts of GSDR and the IMF to bring inflation down will be successful. It should be noted that inflation rates exceeding 25-30% render all forecasting of future trends less meaningful.

Access to Foreign Exchange. GSDR has officially sanctioned a free market exchange rate, commonly available and determined by supply and demand. At the time of this writing (October 1985), one could obtain dollars on

EXHIBIT 5:

PRO FORMA CASH FLOW, PRESENT VALUE, AND INTERNAL RATE OF RETURN
(in thousands of Somali shillings)

	Year 1	Year 2	Year 3	Year 4	Year 5
INFLOWS:					
Revenues	32013.71	52415.36	83609.57	107095.03	132113.86
Working Capital Loans	8500.00	0.00	0.00	0.00	0.00
Total	40513.71	52415.36	83609.57	107095.03	132113.86
OUTFLOWS:					
Operating Expenses	32963.57	47452.56	64599.02	79829.45	99149.76
Labor	16614.00	20829.60	23184.36	24709.15	29050.48
Inputs	9946.83	16139.88	24692.75	33701.30	43676.51
Administration	1600.69	2620.77	4180.48	5354.75	6605.69
Miscellaneous	4802.06	7862.30	12541.44	16064.25	19817.08
Financial Costs	2301.21	2761.45	3313.74	3976.48	4771.78
Total	35264.78	50214.00	67912.76	83805.94	103921.54
Sub-Total Cash Flow	5248.93	2201.36	15696.82	23289.09	28192.32
Taxes	0.00	49.40	4984.27	7923.23	10014.53

TOTAL CASH FLOW	5248.93	2151.96	10712.55	15365.86	18177.78

Discounted at 10%	4771.76	1778.48	8048.50	10495.09	11286.97

PRESENT VALUE AT 10%					
(years 1-5)	36380.80				
(years 6-10)	75798.92				

INTERNAL RATE OF RETURN					
(years 1-5)	32.1%				

Assumptions:

1. Administrative expenses include office expenses, sales promotion expenses, and sales discount, and are assumed to be 5% of revenues. Administrative labor is included under "labor."
2. Inputs include all raw materials, chemical inputs, and electricity.
3. Miscellaneous includes repairs and maintenance, insurance, and other unforeseen expenses; it is assumed to represent 15% of sales.
4. Initial working capital is provided in the form of a dollar-denominated five-year loan at 11% annual rate of interest: it is equal to US \$100,000, three months of operating expenses.
5. Cash flows for years 6-10 are equal to cash flow of year 5 increased by a 15% annual inflation factor; their present value is calculated to reflect their worth in year 5.

this free market at the rate of SS 100 for 1USD. We assume that due to currency inflows from increased exports and the new Commodity Import Programs (CIP), the free market rate will decline to SS 85 per dollar during year 1 of our analysis, and thereafter increase by 20% annually. We assume that FMW will be able to obtain its annual foreign exchange requirements freely at these exchange rates. (Foreign exchange requirements range from \$114,000 to \$163,000 per year, depending on whether working capital is borrowed in U.S. dollars or in Somali shillings. See Appendix IV, Table A-18 for the calculation of foreign exchange requirements.)

Taxation. For the purpose of our analysis, we have assumed that FMW is taxed as a private enterprise (at 35% of gross income). Furthermore, we have assumed that FMW doesn't pay any "presumptive" profit taxes on its government sales. Suppliers to government agencies have been subjected to a tax of up to 30% of the invoice value to be paid at invoicing date and only offset against year-end profit taxes. This policy is not sanctioned by any law and can be a severe drain on cash flow.

Access to Raw Materials A 1979 feasibility study for a proposed mini-steel mill estimated the available scrap iron deposits in Somalia at 8,000 MT, and steel scrap deposits at 18,500 MT.¹ FMW's projected annual requirements of scrap iron and scrap steel do not exceed 92 MT and 135 MT, respectively. We assume that FMW will have access to these domestic resources and hence will procure all scrap domestically. Somalia has an estimated 170 million tons of iron ore deposits.² However, these deposits are not yet commercially exploited and are of questionable quality. We have assumed that FMW procures all pig iron from abroad.

Availability of Diesel Fuel. Currently, the importation and distribution of petroleum products is handled by the Government-owned national petroleum agency and the ISKIASH cooperative. Neither organization is adequately prepared to handle these functions properly and periodic shortages are the result. We assume that FMW will not be affected by these shortages.

1 "Feasibility Study for Setting Up a Mini-steel and Rolling Mills in Somalia." Investment Advisory Centre of Pakistan. 1979.

2 "The Potential for Resource-based Industrial Development in the Least Developed Countries." UNIDO. 1983.

SECTION 2 MANAGEMENT ISSUES

With the implementation of our recommendations, an entirely new venture would emerge with the following characteristics:

- o A professional management team hired on the basis of its qualifications and experience,
- o A motivated labor force supervised by a team of foremen and qualified technicians,
- o A drastically revised salary structure that provides incentives for performance and tenure,
- o A streamlined, targeted product policy that reflects FMW's growing technical and managerial capabilities, and
- o A rationalized marketing campaign that includes vigorous sales efforts to support the product policy.

To effect such a dramatic departure from existing practice, it is essential that the following conditions be fulfilled:

Managerial freedom of action. Following the above recommendations, a manual laborer of FMW would receive wages that exceed the salary GSDR currently pays its senior government officials. FMW's management must have freedom to implement our payroll recommendations, and hire and fire people as they see fit. Similarly, management must have freedom to determine what products to carry and at what price. These decisions must depend on FMW's profit objectives and not on government approval.

Singularity of purpose. FMW was originally created with a complex set of objectives: to create an industrial infrastructure, to provide jobs, and to generate revenues. In our scenario, FMW's objectives are pared down to the single purpose of becoming a profit-making enterprise.

Additional equipment and working capital. A total investment of SS 19.4 million (\$228,000) is required to rehabilitate existing equipment and make the

essential additions. Working capital of up to SS 8.5 million (\$100,000) is required to start up the operations.

The question is whether GSDR can fulfill these conditions. Several very important considerations seem to work against continued government operation. First, as the government is coming under increasing pressure to reduce its expenditures, GSDR would have considerable difficulty supporting the payroll that we recommend as essential. (It should be noted that FMW's projected payroll of year 1 approaches the 1984 payroll of the entire Ministry of Finance.¹) Moreover, such a policy decision would set a precedent that is bound to create a clamor among the other parastatals.

A second consideration is that in the past, GSDR's patronage system has often been the source of management staff for public enterprises. As the government is under increasing pressure to reduce its civil service staff, it seems likely that pressures to use positions in public enterprises for patronage favors will also grow, thus not allowing for managerial freedom of action.

Thirdly, FMW has relied on UNIDO--being the firm's co-founder--to finance equipment additions and, at times, even raw materials. However, this organization has become increasingly reluctant to provide additional funds, so the investment required to support the suggested rehabilitation likely will have to come from elsewhere.

In the private sector these constraints are far less restrictive. Availability of funds for salary restructuring and additional capital outlay is determined by the resulting profit potential and not by national budget considerations. Profit maximization is the single most important purpose underlying private business management. It provides the kind of motivation and incentive that, as we have pointed out, is essential to turn FMW around and fuel its

¹ Source: "Somalia: Maintaining the Recovery Program." IBRD. June, 1985.

continued growth. This report concludes that given the current economic and political situation in Somalia, only the private sector will be able to run FMW as a profit-making enterprise.

SECTION 3 OWNERSHIP ISSUES

Few Somali manufacturing firms clearly separate ownership and management. Throughout the public enterprises, management is appointed or sanctioned by GSDR, and all major decisions need prior government approval. In the private sector, with few exceptions, enterprises are owned and run by members of the same family. Therefore, our recommendation that the private sector should take over the management of FMW would seem to lead to the conclusion that the private sector should acquire ownership as well.

However, several currently prevailing conditions, in our opinion, render this ownership transfer an option that is not yet feasible. These conditions include:

Political Problems. Although GSDR has declared itself in principle in favor of privatization as a concept, there is no question that the actual decision would stir up considerable political controversy.

Legal Problems. Never before in Somalia has a public enterprise been denationalized; numerous legal ambiguities surround such ownership transfer, and would leave a private investor open to future claims or even outright repossession. (It should be noted that UNIDO, although it contributed to FMW's original capitalization and has made several contributions since then, does not consider itself an equity holder or creditor).

Distrust. Indications are that the atmosphere of distrust between the public and the private sector, which has grown during 15 years of state socialism, still exists and colors most transactions.

Operational Uncertainties. FMW has never run profitably and has no experience with the policies we recommend. In addition, an investor must face many uncertainties concerning all the assumptions underlying our revenue projections.

Economic Uncertainties. Great uncertainties continue to exist in the economic environment: for example, if the inflation rate does not abate, our revenue projections will be less meaningful.

The political controversy on the one hand and the uncertainties on the other create a gap between the price GSDR will expect to get for FMW and what the private sector will be willing to pay. The government's asking price will be a

political decision designed to overcome internal resistance. A price at least equal to or exceeding the current market value of FMW's assets may be politically necessary. Estimates on this value range from SS 51 million (US \$600,000) to SS 63 million (US \$740,000) depending on whether land is included. (For a detailed analysis of the value of FMW's assets, see Appendix II).

The private investor, on the other hand, faced with the unusually large number of uncertainties discussed above will be reluctant to tie up any funds in manufacturing assets, either as an outright owner or as a joint-venture partner, unless the return will be high enough to compensate for these risks. In light of FMW's past performance and the uncertainties surrounding its future performance, it is unlikely that at this time a private investor will pay anything for FMW beyond the initial investment of SS 19.4 million (US \$228,000) needed for rehabilitation.

At present, the Somali socio-economic environment is in a state of flux and evidently none of the problems and uncertainties mentioned is of a permanent nature. If the current liberalization trend continues, privatization will likely become a less controversial issue. And, if our projections bear out over time, a private investor would be presented with a risk/return trade-off that would justify an eventual offer much closer to what the government expects to receive. According to our forecast, in 5 years FMW could be worth SS 75.8 million to an investor. (See Exhibit 5).

The gap between FMW's present owner and potential future owner is too wide to bridge in one transaction under the present conditions, but we believe that over the next few years, as FMW realizes its product and profit potential, complete transfer of the foundry to the private sector will be both a viable and appealing possibility.

SECTION 4 CONCLUSION

We recommend that FMW be leased to a private entrepreneur for a period of 5 years with an option to purchase the enterprise at the end of 5 years.

This arrangement creates an interim period during which the private entrepreneur runs FMW while the government retains ownership. It allows GSDR to postpone a controversial decision that probably is best not made at the present time. Meanwhile, a situation will be created whereby FMW stands the best chance of becoming a viable enterprise.

Traditionally, a lease agreement calls for periodic lease payments determined on the basis of the value of plant and equipment, assuming their earnings potential has been proven in the past. In our scenario, the plant's earnings potential has yet to be proven; moreover, the lessee is required to make an up-front investment of SS 19.4 million (US \$228,000) to rehabilitate and improve plant and equipment. This investment will not be retrieved at the end of the lease. Without any lease payments, the initial investment is projected to yield a 32% return over 5 years (See Exhibit 5). We feel that a potential investor probably considers such a return the minimum required in view of the many uncertainties involved. We therefore recommend that the GSDR lease plant and equipment to the entrepreneur in return for the initial investment and that no additional lease payments be charged.

A lease arrangement of this nature reduces the entrepreneur's risk to a level that is acceptable in light of the potential returns. In addition, the entrepreneur retains the option to acquire ownership at a future date when FMW's earnings potential has become more evident.

To make the arrangement satisfying for both parties, several details need to be carefully worked out, including:

Organization. To shield the entrepreneur from outstanding claims against FMW, a new state-owned enterprise could be created to which all of FMW's fixed assets would be transferred at their fair market value. This new entity in turn would enter into the lease agreement with the entrepreneur.

Contract. It is essential that a detailed contract be drawn up that includes stipulations on accounting principles, depreciation rules, and taxation schedules.

Purchase Price. Although this decision could be postponed until the end of the lease, both parties may decide to agree on a price at the outset. The discounted value of the cashflows for years 6-10 could be used as a guideline (see Exhibit 5).

Foreign Investors

In addition to the uncertainties Somali investors are facing, foreign investors must add the future value of the Somali shilling into their risk/return trade-off analysis.

If a foreign investor provides the initial investment, an annual devaluation of 20% of the Somali shilling relative to the dollar would reduce the internal rate of return over 5 years to 0%, assuming that all profits can be repatriated. (See Exhibit 6, and Appendix V, "Accounting Issues for Foreign Investors".) Unless the foreign investor is insured (which is not a possibility at this writing) against currency losses, the potential returns don't justify the risks.

A foreign investor could, however, enter into some sort of joint venture agreement with a local entrepreneur whereby the division of returns to both parties reflects the relative risk to each.

EXHIBIT 6:

PRO FORMA CASH FLOW, PRESENT VALUE, AND INTERNAL
RATE OF RETURN TO A FOREIGN INVESTOR
(in thousands of Somali shillings)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total Cash Flow	5248.93	2151.96	10712.55	15365.86	18177.78
Discounted at 32%*	3976.47	1235.05	4657.69	5061.29	4535.96
Present Value at 32% (years 1-5)	19466.49				
Internal Rate of Return (years 1-5)	0%				

* The discount rate is that which will compensate the foreign investor for the assumed cost of capital (10%) and the projected annual rate of currency devaluation (20%). It is calculated by multiplying the factors 1.1 and 1.2.

Assumption:

All profits are repatriated.

Role of US AID

The implementation of this novel arrangement would be greatly facilitated if it were supported by technical assistance programs, specifically:

Mediation. The proposed arrangement includes several new and untried features that could complicate the negotiations. Mediation by a third party may be essential to the successful outcome.

Legal Assistance. Considerable expert advice is required to create an adequate legal framework. Moreover, the legal ambiguities surrounding denationalization need to be resolved before any final ownership transfer can take place.

Supervision. One approach would be to include in the structure a tripartite board including a representative from GSDR, the entrepreneur, and a third party.

On a broader scale, we suggest that this lease arrangement be considered as a possible solution in other privatization efforts in which US AID is involved in Somalia, or indeed elsewhere in Africa. While it is not without potential complexities, we believe it may prove to be a valuable interim solution in situations where it is difficult to readily attract foreign investors, where domestic investment resources are limited, and so long as the government's commitment to privatization remains open to question.

APPENDIX I:

THE PERSONNEL AND LABOR ANALYSIS

1. Staffing Recommendations

The following are detailed recommendations that we feel are essential to achieving FMW's operational and profit objectives:

Pay adequate salaries. Based on interviews with educators, private businessmen, government officials, and private citizens we have formulated a payscale that would provide adequate incentives. Details of the recommended payscale appear in Table A-2.

Create a nucleus of skilled people in all departments. We recommend that the foundry, the metal workshop and the machinshop each have a team of one engineer and one skilled foreman to provide supervision and guidance.

Appoint a tool and manufacturing engineer. Supported by 2 draftsmen, this person would design jigs and fixtures for milling, drilling, and holding the parts for welding in place, to ensure compatibility and uniformity of parts.

Initiate a preventive maintenance program. An engineer should be hired specifically for this purpose.

Create an ongoing training program. The newly founded Industrial Vocational Training Center in Mogadishu promises to become an excellent source of trained technicians. It offers an 18-month program including basic training followed by specialized training for expert auto mechanics, electricians, machine operators, and machine maintenance people. The student/instructor ratio varies from 8 to 1 to 16 to 1, which compares very favorably with the ratios maintained in U.S. vocational schools. Trainees are placed and paid for by industrial employers. We recommend that FMW place 5 trainees each year at the center while retaining them on its payroll.

Hire expatriates for the key positions of General Manager, Chief Engineer, and Chief Accountant. Expatriate experts from Europe and the United States demand monthly salaries of \$3,000 and up, clearly out of the reach of FMW. However, it will be relatively easy to hire well qualified experts from such countries as India, Pakistan, China, and South Korea, countries that have a long tradition of foundry technology and where the salaries are considerably lower than in the west.

2. Personnel and Labor Cost Calculations

In addition to the foregoing personnel suggestions, we would create a new marketing department with a marketing manager and salespeople, to start. A purchasing and inventory manager is required, and 4 administrative people would be working with the accountant and at other miscellaneous tasks. Two guards will be hired to watch the grounds. Production people will involve 3 foremen, 2 draftsmen, and 5 engineers at the start.

The number of laborers was determined by the methodology described below. In total, the FMW will hire 65 people in the first year of operation and expand to 80 people by the fifth year. (See Table A-1) Their salaries and pay increases are described in the Payroll Table, Table A-2. The yearly payroll will represent 50% of total operating expenses in the first year, but due to the experience effect and the replacement of expatriates with Somali managers in years 3 and 4, the payroll becomes only 29% of total operating expenses in the fifth year.

Laborer Calculations

As shown in Tables A-3 and A-4, we determined metal output in MT corresponding to the final production as estimated in the market analysis (See Appendix III). Then calculations were made on the number of man days required to produce that quantity of output for the foundry. For the metal workshop and machinshop, we took account of each product and the time their production would require. This is shown in Tables A-5 to A-7. The total number of workers required is summarized in Table A-1.

TABLE A-1:
TOTAL LABOR FORCE

	Year 1	Year 2	Year 3	Year 4	Year 5
General Manager	1	1	1	1	1
Chief Engineer	1	1	1	1	1
Engineers	5	5	6	6	6
Chief Accountant	1	1	1	1	1
Marketing Manager	1	1	1	1	1
Purchasing/Inventory Manager	1	1	1	1	1
Foreman	3	3	4	4	4
Draftsman	2	2	3	3	3
Laborers	36	40	45	45	45
Foundry	9	11	13	13	13
Metal Workshop	23	24	25	25	25
Machineshop	4	5	7	7	7
Trainees	5	5	5	5	5
Administrative Assistant	1	2	2	2	2
Administration	3	3	3	3	3
Guards	2	2	2	2	2
Salesforce	<u>3</u>	<u>4</u>	<u>5</u>	<u>5</u>	<u>5</u>
Total	65	71	80	80	80

TABLE A-2:

TOTAL MONTHLY PAYROLL

(in thousands of Somali shillings)

	Base Salary (in SS)	Base Salary (in US \$)	Year 1	Year 2	Year 3	Year 4	Year 5
General Manager	170000	2000	170.00	204.00	244.80	77.76	93.33
Chief Engineer	170000	2000	170.00	204.00	50.40	60.48	72.59
Engineers	25000		125.00	150.00	208.80	250.60	300.78
Chief Accountant	102000	1200	102.00	122.40	36.00	43.20	51.85
Marketing Manager	18000		18.00	21.60	25.92	31.10	37.33
Purchasing/ Inventory Manager	18000		18.00	21.60	25.92	31.10	37.33
Foreman	18000		54.00	64.80	98.48	118.22	141.83
Draftsman	18000		36.00	43.20	72.56	87.11	104.50
Laborers	15000		540.00	690.00	892.35	1026.00	1181.25
Trainees	7500		37.50	45.00	54.00	64.80	77.78
Administrative Assistant	15000		15.00	32.40	38.00	45.64	54.72
Administration	10000		30.00	36.00	43.20	51.84	62.22
Guards	7500		15.00	18.00	21.60	25.92	31.11
Salesforce	18000		54.00	82.80	120.00	145.32	174.26
TOTAL MONTHLY PAYROLL			1384.50	1735.80	1932.03	2059.10	2420.87
TOTAL YEARLY PAYROLL (in thousands of SS)			16614.00	20829.60	23184.36	24709.15	29050.48

Assumptions:

1. Expatriates are replaced by nationals:

The general manager is replaced by an internally trained Somali in year 4.

The chief engineer is replaced by a former engineer in year 3.

The chief accountant is replaced by a former admin. asst. in year 3.

Expatriates receive their salaries in US dollars.

2. Engineers: Total of 5--1 tool/manufacturing; 1 maintenance engineer;

1 welding; 1 foundry; 1 machine shop; one engineer is added in year 3.

3. Domestic salaries are increased by 20% annually.

4. New employees receive 80% of the tenured employees' salaries.

5. Laborers' wage bill increases by 15% annually to reflect turnover.

6. Expatriate salaries expressed in Somali shillings increase by 20% to reflect increases in the exchange rate.

TABLE A-3:
PRODUCTION IN METRIC TONS

	Year 1	Year 2	Year 3	Year 4	Year 5
Kitchen stoves (set of 3)	27.00	36.00	46.80	46.80	46.80
Garbage containers	1.00	3.00	10.00	16.00	30.00
Animal-drawn implements	21.56	34.50	57.50	57.50	57.50
Corn Grinders	16.00	20.00	24.00	24.00	24.00
Chopper/sickle	25.00	40.00	50.00	60.00	71.00
Hoes, Spades, or Rakes	25.00	40.00	50.00	60.00	71.00
Grates	5.00	6.00	7.00	8.00	9.00
Tanks	60.00	75.00	90.00	112.50	112.50
Total Parts	14.60	20.40	25.56	27.76	30.16
Parts-Aluminum	2.92	4.08	5.11	5.55	6.03
Parts-Copper	<u>11.68</u>	<u>16.32</u>	<u>20.45</u>	<u>22.21</u>	<u>24.13</u>
TOTAL WEIGHT OF PRODUCTION	195.16	274.90	360.86	412.56	451.96

Assumptions:

1. Total tonnage of cast aluminum and copper parts represents 20% of the tonnage of cast iron produced.
2. Twenty percent of the parts are made of aluminum, 80% of copper.

TABLE A-4:
FINAL OUTPUT OF METAL IN METRIC TONS

	Year 1	Year 2	Year 3	Year 4	Year 5
Cast Iron	73.0	102.0	127.8	138.8	150.8
Sheet Metal	61.0	78.0	100.0	128.5	142.5
HC Steel	2.2	3.5	5.8	5.8	5.8
Steel from Scrap	44.4	71.1	101.8	111.8	122.8
Aluminum	2.9	4.1	5.1	5.6	6.0
Copper	11.7	16.3	20.4	22.2	24.1

TABLE A-5:

TOTAL LABOR FORCE--FOUNDRY

	Year 1	Year 2	Year 3	Year 4	Year 5
<u>Cast Iron</u>					
Final Output (MT)	73.0	102.0	127.8	138.8	150.8
Rejects	7.3	8.2	8.9	9.7	10.6
Liquid Output	80.3	110.2	136.7	148.5	161.4
Number of pours	113.0	155.0	192.0	208.0	226.0
Man days per pour	15.3	14.5	14.0	13.0	12.0
Total Man days	1729	2248	2688	2704	2712
<u>Copper</u>					
Final Output (MT)	11.7	16.3	20.4	22.2	24.1
Rejects	1.2	1.3	1.5	1.6	1.7
Liquid Output	12.9	17.6	21.9	23.8	25.8
Number of pours	86.0	118.0	146.0	159.0	172.0
Man days per pour	3.2	3.0	2.9	2.7	2.5
Total Man days	276	354	424	430	430
<u>Aluminum</u>					
Final Output (MT)	2.9	4.1	5.1	5.6	6.0
Rejects	0.3	0.3	0.4	0.3	0.4
Liquid Output	3.2	4.4	5.5	5.9	6.4
Number of pours	80.0	110.0	138.0	148.0	160.0
Man days per pour	0.9	0.8	0.8	0.7	0.7
Total Man days	72	88	111	104	112
TOTAL LABOR-FOUNDRY					
Total Man days	2077	2690	3223	3238	3254
Total People	9	11	13	13	13

Assumptions:

1. Liquid output of the foundry is calculated by adding rejects to the final production; the reject rate is assumed to be: 10% in year 1; 8% in year 2; and 7% in the following years. (Source: "Foundry Design and Equipment Selection in Developing Countries" USAID. 1976.)

2. Liquid output per pour is assumed to be: 714 MT for cast iron; .15 MT for copper; .04 MT for aluminum. (Source: "Final Project Report for the Construction of the Foundry and Machining Shop - Somalia." Living Consultant Group: Sarajevo. 1972.)

TABLE A-6:
TOTAL LABOR FORCE--METAL WORKSHOP

	Year 1	Year 2	Year 3	Year 4	Year 5
Garbage containers/tanks					
Units	81	103	130	166	180
Man days/unit	40	28	15	12	10
Total Man days	3240	2884	1950	1992	1800
Animal-drawn implements					
Units	750	1200	2000	2000	2000
Man days/unit	1.0	0.7	0.7	0.5	0.5
Total Man days	750	840	1400	1000	1000
Hoes, spades, or rakes					
Units	25000	40000	50000	60000	71000
Man days/unit	0.040	0.029	0.026	0.025	0.025
Total Man days	1000	1160	1300	1500	1775
Repair					
Revenues (thousands of SS)	1524.46	3429.04	7600.87	9735.91	12010.35
Labor content	0.35	0.26	0.20	0.19	0.18
Labor costs (thousands of SS)	533.56	891.55	1520.17	1849.82	2161.86
Average Daily Wage	720	828	952	1096	1260
Total Man days	741	1077	1597	1688	1716
TOTAL LABOR--METAL WORKSHOP					
Total Man days	5731	5961	6247	6180	6291
Total People	23	24	25	25	25

TABLE A-7:
TOTAL LABOR FORCE--MACHINESHOP

	Year 1	Year 2	Year 3	Year 4	Year 5
Corn grinders					
Units	2000	2500	3000	3000	3000
Man days/unit	0.005	0.004	0.003	0.003	0.003
Total Man days	10	10	9	9	9
Chopper/sickle					
Units	25000	40000	50000	60000	71000
Man days/unit	0.002	0.001	0.001	0.001	0.001
Total Man days	50	40	50	60	71
Animal-drawn implements					
Units	750	1200	2000	2000	2000
Man days/unit	0.33	0.22	0.20	0.20	0.20
Total Man days	248	264	400	400	400
Hoes, spades, or rakes					
Units	25000	40000	50000	60000	71000
Man days/unit	0.002	0.001	0.001	0.001	0.001
Total Man days	50	40	50	60	71
Spare parts					
Total (MT)	14.6	20.4	25.56	27.76	30.16
Man hours/MT	250	250	250	250	250
Total Man hours	3650	5100	6390	6940	7540
Total Man days	608	850	1065	1157	1257
TOTAL LABOR - MACHINE SHOP					
Total Man days	966	1204	1574	1686	1808
Total People	4	5	7	7	7

APPENDIX II:
THE TECHNICAL ANALYSIS

From August 17 to September 4, 1985 Mr. Earl Sweet, Foundry Expert from Klamath Falls, Oregon, visited FMW to evaluate the condition of the plant and its equipment, make estimates for replacement costs and current value, determine what additions were needed, and make general recommendations for improving the operations. This is a summary of his findings.

1. Plant and Equipment

Foundry. The building and equipment are generally in good condition. The foundry's equipment is in good working order. The elevator that places raw materials in position for feeding into the cupola furnaces needs to be replaced. Both cupola furnaces are overdue for their periodic overhauls.

Metal workshop. The metal workshop shares the foundry building. Seventy percent of the building is occupied by the foundry, which doesn't leave adequate space for metal fabrication activities. Originally this arrangement was adopted as an interim solution, but it has never been changed.

We recommend that one of the two unfinished buildings currently on the premises be finished and equipped for metal fabrication. Specifically, the new building should be equipped with an overhead traveling crane. A concrete apron should be added on one side of the building, with a monorail running down the center of the building and out over the apron. The monorail should have 2 traveling hoists to lift products and materials. All the plant's sheet metal rolls, shears, and other metal-working machinery should be moved into this building. Most equipment available is in good condition, except for one metal shear, which needs repair. We recommend the addition of 2 wirefeed arc welders, which would significantly reduce the time needed for welding and improve the quality, and a 20 MT punch press to punch out such products as cultivator cutters from scrap steel. The punch press needs up to 5 dies (to be procured from Hong Kong).

Machinshop. The building and equipment are in good condition and no additions are needed. A horizontal milling machine now in the metal shop needs to be moved to the machinshop, and the installation of a few pieces of equipment needs to be finished.

Laboratory. This facility is equipped for performing tests of sand and cast iron. It hasn't been used in the last 10 years, and the equipment has fallen into disrepair. The facility is essential for quality control and we recommend the installation of new equipment as being more cost-effective than rehabilitating the existing equipment.

Pattern shop. The foundry has its own pattern shop; it is well equipped and in good condition.

Safety equipment. Working conditions are bad throughout the plant and particularly in the foundry. We recommend the immediate purchase of safety gear, specifically, eye protection for all employees, and shoes and shin-guards for the foundry and metal workers. Employees would be responsible for storing and caring for their own gear and should not be allowed to work without it. In fact, to ensure that safety equipment does not find its way to the market place, it seems sensible to insist on a no-gear-no-work-no-pay policy--a considerable penalty when new payscales are in effect.

Electricity. The current electricity supply, 160 kv, is subject to frequent interruptions. We recommend the installation of a 300 kv diesel generator to ensure uninterrupted and sufficient power supply under the production schedule.

Recapitulation of Cost. Table A-8 shows the costs involved in rehabilitating the plant and equipment and adding new equipment.

2. Steelmaking

At present FMW is not equipped to make its own steel. Installing the necessary equipment would add an entirely new dimension to the operation, opening up possibilities to supply the construction industry where there is a demand for reinforced steel bars, and the machine and transportation industry, where the demand is for high quality spare parts. However, because both capital and expertise requirements are considerable, we recommend that, for now, FMW does not get involved in steelmaking, but rather includes it as one of its long-range objectives.

TABLE A-8:
PROJECTED COSTS OF REHABILITATION AND IMPROVEMENTS

<u>Item</u>	<u>Cost Estimate (US\$)</u>
Overhaul cupola furnaces	6,000
Finish metal workshop building	25,000
Overhead traveling crane, monorail, hoists	10,500
Wirefeed arc welders	10,000
20 MT punch press	20,000
Dies (5 x \$5,000)	25,000
Laboratory equipment	20,000
Safety gear	1,000
300 kv generator	<u>100,000</u>
Subtotal	217,500
Repair, miscellaneous (5% of subtotal)	<u>10,875</u>
Total (US \$)	228,375
(SS)	19,400,000

Assumptions:

1. Prices include shipping, installation.
2. Equipment is imported duty free.

3. Current Value of Plant and Equipment

Table A-9 shows the estimated values of buildings, infrastructural improvements, and land. Values range from SS 30 million (US \$353,000) to SS 42 million (US \$500,000) depending on whether land is included.

Table A-10 shows the estimated replacement costs and current value, considering its present condition, of all equipment. Estimated replacement costs are SS 30 million (US \$353,000); estimated current value is SS 21 million (US \$245,000).

Total estimated current value of plant and equipment ranges from SS 51 million (US \$600,000) to SS 63 million (US \$740,000) depending on whether land is included.

All values are as of August, 1985.

TABLE A-9:

ESTIMATED VALUE OF BUILDINGS, INFRASTRUCTURE, AND LAND

		<u>Current Value (000's SS)</u>
<u>Buildings</u>	Office Building	11,000
	Warehouse	1,300
	Foundry and Workshop	10,500
	Machineshop	<u>1,200</u>
	Total Buildings	24,000
<u>Infrastructure</u>	Boundary Wall	3,000
	Filling Station	1,000
	Roads	<u>2,000</u>
	Total Infrastructure	6,000
<u>Land</u>		<u>12,000</u>
TOTAL (000's SS)		42,000
(US \$)		494,000

TABLE A-10
REPLACEMENT COSTS AND CURRENT VALUE OF EQUIPMENT

A. FOUNDRY EQUIPMENT (US \$)

<u>Year</u> <u>Mfg.</u>	<u>Replacement Cost</u>	<u>Current Value</u>
75 Copper Melt Furnace	2,000	1,000
75 Alum. Melt Furnace	2,000	1,000
75 Alum. Melt Furnace	2,000	1,000
75 Large Cupola] 10,000]] 5,000]
75 Small Cupola		
75 Sand Mixing Machine	10,000	6,000
75 Vibrator	4,000	3,000
75 Core Sand Mixer	3,000	2,000
75 Drying Oven	10,000	6,000
75 Moulding Mach. #1	6,000	4,000
75 Moulding Mach. #2	6,000	4,000
75 Sand Blaster	3,000	2,000
75 Band Saw	4,000	2,500
75 Grinder #1	2,000	1,500
75 Grinder #2	<u>1,500</u>	<u>1,000</u>
TOTAL EQUIPMENT-FOUNDRY (US \$)	65,500	40,000

REPLACEMENT COSTS AND CURRENT VALUE OF EQUIPMENT (Cont'd.)

	<u>Replacement Cost</u>	<u>Current Value</u>
B. METAL WORKSHOP EQUIPMENT (US \$)		
Milling Machine (Horizontal)	12,000	10,000
Sheet Metal Brake	3,500	2,000
Shears #1	12,000	9,000
Shears #2	10,000	5,000
Steel Plate Roller #1	8,000	6,000
(Left by Russians) #2	8,000	4,000
Pipe Bender	250	200
Radial Drill	4,000	3,000
Iron Workers (Shears) #1	5,000	4,000
Iron Workers (Shears) #2 (Left by Russians)	2,000	750
Arc Welder Machines (7)	<u>2,800</u> (400 ea)	<u>1,750</u> (250 ea)
TOTAL EQUIPMENT - METAL WORKSHOP (US \$)	67,550	45,700

REPLACEMENT COSTS AND CURRENT VALUE OF EQUIPMENT (Cont'd.)

C. MACHINESHOP EQUIPMENT (US \$)

<u>Year</u> <u>Mfg.</u>			<u>Replacement Cost</u>	<u>Current Value</u>
80	Engine Lathe	#1	8,000	5,000
78	Engine Lathe	#2 (Left by Russians)	10,000	5,000
78	Engine Lathe	#3 (Left by Russians)	10,000	5,000
75	Engine Lathe	#4	12,000	8,000
75	Engine Lathe	#5	12,000	8,000
76	Engine Lathe	#6	2,000	14,000
76	Engine Lathe	#7	20,000	14,000
76	Metal Shaper	#1	4,500	2,500
	Metal Shaper	#2	4,000	2,000
76	Hor/Vert Milling Mach.	#1	10,000	7,500
76	Hor/Vert Milling Mach.	#2	8,000	4,500
76	Annealing Furnace		1,000	800
76	Mechanical Press		4,500	4,000
76	Power Hacksaw		1,500	1,000
76	Metal Band Saw		2,500	2,000
76	Thread Cutting Machine	#1	1,500	1,000
80	Thread Cutting Machine	#2	2,500	2,500
76	Drill Press	#1	1,500	1,000
76	Drill Press	#2	1,500	1,000
80	Sand Blaster		3,500	3,000
80	Air Compressor		2,000	2,000
84	Hand Press/ Pump Testing Equipment		<u>15,000</u>	<u>15,000</u>
TOTAL EQUIPMENT - MACHINESHOP (US \$)			137,500	108,800

D. LABORATORY EQUIPMENT (US \$)

15,000 7,500

REPLACEMENT COSTS AND CURRENT VALUE OF EQUIPMENT (Cont'd.)

E. PATTERN SHOP EQUIPMENT (US \$)

<u>Year</u> <u>Mfg.</u>		<u>Replacement Cost</u>	<u>Current Value</u>
75	Milling Mach. (Woodworking)	3,000	2,500
75	Band Saw #1	1,000	800
75	Band Saw #2	3,000	2,000
75	Saw Blade Welder	800	600
75	Table Saw	400	250
75	Disc Sander #1	800	600
75	Disc Sander #2	5,000	3,500
75	Drum Sander	1,500	1,100
75	Wood Lathe #1	1,000	800
75	Wood Lathe #2	800	600
75	Belt Sander		
75	Saw Blade Sharpener	2,000	1,500
75	Bench Grinder	50	30
75	Jointer	2,500	2,000
TOTAL EQUIPMENT - PATTERN SHOP (US \$)		21,850	16,280

F. ADDITIONAL EQUIPMENT (US \$)

2	Overhead traveling cranes, 5M T	30,000 (15,000 ea.)	15,000 (7,500 ea.)
3	Post cranes with electric hoists	10,500 (3,500 ea.)	5,250 (1,750 ea.)
	Accessory equipment	5,000	2,500
<u>TOTAL ADDITIONAL EQUIPMENT (US \$)</u>		<u>45,500</u>	<u>22,750</u>

<u>TOTAL EQUIPMENT, A-F (US \$)</u>		<u>352,900</u>	<u>241,030</u>
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(SS)	<u>29,996,500</u>	<u>20,487,550</u>
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APPENDIX III:
THE MARKET ANALYSIS

An analysis of the market indicates that it is feasible to sell each annual FMW production output if proper marketing techniques are used and a good sales force is available. Production is built up over the 5 years to reflect the effect of the experience and training of Somali workers. We have chosen a limited number of products that can be easily produced in the beginning and provide FMW's workers with experience, after which a more complicated product line can be attempted. Each product is discussed briefly.

KITCHEN STOVES: The market potential for these units was determined by using the following information and making the following assumptions:

<u>Information/Assumption</u>	<u>Source</u>
◦ Approximately 4,300 new homes are built in Mogadishu each year	Mogadishu Municipality Council
◦ 75% of new homes are equipped with traditional cast iron stoves	Assumption
◦ FMW can capture 75% of this market given its competitors small capacity	Assumption
◦ There are approximately 75,000 existing homes in Mogadishu	Mogadishu Municipality Council
◦ The replacement market equals 5% of the existing homes	Assumption
◦ FMW can capture 75% of this market as well	Assumption

We assume that by year 3, FMW will be able to fully capture its potential market share. Stoves are sold in sets of 3 different sizes; each set weighs 9 kg and costs SS 1,200 in year 1; that is SS 134 per kg.

GARBAGE CONTAINERS: Based on interviews with the Mogadishu Municipality, the market for FMW-produced garbage containers was found to be approximately 60 in the foreseeable future. Given the municipality's finances and FMW's

capabilities, we assume that in year 1, FMW will produce 1 unit; 3 in year 2; 10 in year 3; 16 in year 4; and 30 in the fifth year. Each unit weighs 1 MT and will cost SS 160,000 in the first year or SS 160 per kg.

ANIMAL-DRAWN IMPLEMENTS: Four types of animal-drawn implements will be produced: the small disc-harrow, the cultivator, the plow and the triangular harrow. The market analysis here is based on UNIDO's 1985 study, "Agricultural Tools, Implements and Machinery" by Swamy Rao. Given that these implements are substitutes for tractors, and that diesel fuel is in short supply, animal-drawn implements will be a growing market although at present it is small. The market (in 1986-1988) can support 1,000 units of each implement. We assume FMW will be able to achieve a 19% market penetration in the first year; 30% the second year; and 50% in each of the following years. Based on FMW's price list, the following prices will be charged in the first year:

<u>Unit</u>	<u>Weight (kg/unit)</u>	<u>Price (SS/unit)</u>
Small Disc Harrow	50	13,600
Triangular Harrow	15	5,100
Plow	20	5,100
Cultivator	30	6,800

Very little domestic competition is assumed in the market for these implements; however, aid agencies have imported agricultural tools and could create serious competition if they do not source locally. They could, on the other-hand, be FMW's biggest customer if they decide to buy these implements in Somalia. This will depend on whether they will be allowed by GSDR to use the market exchange rate to buy this equipment.

CORN-GRINDERS: The market potential for these units was determined by using the following information and making the following assumptions:

<u>Information/Assumption</u>	<u>Source</u>
o 118,000 ha are cultivated with corn	World Bank (1985)
o The average size of farms is 3.8 ha	UNIDO (1985)
o On average, farms cultivate 1/3 of their land with corn	Assumption
o 1/4 of the corn farmers will use corn grinders rather than the manual method	Assumption
o FMW can achieve a 13% market penetration every year	Assumption

The resulting market is 23,300 potential clients. Assuming it takes a year to get on-stream, FMW will produce 2,000 units the first year, 2,500 units in year 2, and 3,000 units in each of the following years. As per FMW's price list, the corn grinders will be sold for 2,000 Somali shillings the first year and weigh 8 kg; that is SS 250 per kg.

HAND TOOLS: Handtools are expected to be loss leaders. There is great competition from the informal sector and from cheap imports brought in by aid agencies. Therefore we assume that FMW can capture only 30% of the market. The products are: the chopper and/or sickle, priced at SS 79; the handhoe, priced at SS 60; the spade, priced at SS 77; and the fork and/or rake at SS 106. Each unit weighs 1 kg. The market was determined differently for the chopper/sickle than for the other products.

-- Chopper/Sickle: The market here was estimated using the same methods as for corn grinders. The chopper sickle can be used for wheat, corn, bananas, sugar cane, and sorghum.

<u>Information/Assumption</u>	<u>Source</u>
o 516,600 ha are planted with the above products	World Bank (1985)
o The average farm has 3.8 ha	UNIDO (1985)
o All farms plant one or more of the above products	Assumption
o There is an average of 3.5 workers per farm	From data provided by World Bank (1985) and UNIDO (1985)
o Each farm needs as many choppers/sickles as there are workers because during harvesting season, everyone participates	Assumption

Assuming that the market for chopper/sickles is a replacement market (i.e., that everyone who would buy one already has one) and that 50% is replaced every year, the market for choppers/sickles is 238,000 units per year. FMW can only sell 30% of those, or around 71,000. We assume they sell that much per year by the fifth year of operation, the chopper/sickle is priced at SS 79--its cost to FMW.

-- Hand hoe, spade, fork/rake: We assume that these items could be used on all farms, and that half of all farm workers could make use of a set of tools; 10% of those already have tools, and of these only 30% need to replace them. Therefore, the new market for tools is 214,200 sets of tools and the replacement market is 7,140 sets of tools per year. With a 10% penetration of the new market, and a 30% market share of the replacement market, FMW can sell 23,560 sets, or approximately 71,000 units annually. We assume that it will take 5 years for FMW to gear up for such a large production of hand tools. The hand hoe, spade, and fork/rake are also loss leaders to develop the agricultural market for more profitable products in the future.

GRATES: Volunteers in Technical Assistance (VITA) has a program to introduce fuel-efficient portable stoves in Somalia. They expect demand to be 5,000 units per year and to grow over time. Due to the great quantities of grates required by the future manufacturer of the stove, FMW is assumed to have a monopoly in the production of grates, which will be priced at SS 80 in year 1. The grate weighs 1 kg.

TANKS: Tanks in Somalia are used by the National Petroleum Agency to store fuel and by the construction industry and the government as water storage containers. Fuel tanks are very large, ranging from 2 to 3.5 MT each, while water tanks can weigh as little as 50 kg. So far, most tanks used in Somalia are imported; therefore, we used an estimate of imports to be the size of the

market. Using data on imports of metal containers from the 1983 Somali Trade Statistics, we estimated that 750 MT (or half) were tanks. Assuming FMW can capture 15% of that market, and that an average tank weighs 750 kg, we estimated that FMW eventually can sell 150 tanks. In the first year, however, it would sell less, but by the fifth year, FMW's capabilities will have expanded so that 150 units could be sold. In the first year the tanks would be sold at SS 150 per kg; or SS 112,500 per average tank of 750 kg.

PARTS: In the original feasibility study of FMW¹ it was assumed that total tonnage of cast aluminum and copper parts would represent 20% of the tonnage of cast iron produced. We have used the same assumption and applied an average sales price of SS 250 per kg of finished product in year 1.

REPAIRS: To calculate income from repairs and miscellaneous services, we took a percentage of total income from castings and manufactured items and assumed that in year 1 this ratio will be 5%, increasing to 7% in year 2, and 10% from year 3 onwards.

For a summary of product prices for each unit for each year see Table A-11. Table A-12 shows projected revenues by product.

¹ "Final Project Report for the Construction of the Foundry and Machining Shop--Somalia." Living Consultant Group: Sarajevo. 1972.

TABLE A-11:
PRODUCT PRICES PER UNIT
(in Somali shillings)

	Year 1	Year 2	Year 3	Year 4	Year 5
Kitchen stoves (set of 3)	1200.00	1380.00	1587.00	1825.05	2098.81
Garbage containers	160000.00	184000.00	211600.00	243340.00	279841.00
Animal-drawn implements	7650.00	8797.50	10117.12	11634.69	13379.90
Corn Grinders	2000.00	2300.00	2645.00	3041.75	3498.01
Chopper/sickle	79.00	90.85	104.48	120.15	138.17
Hoes, Spades, or Rakes	78.67	90.47	104.04	119.65	137.59
Grates	80.00	92.00	105.80	121.67	139.92
Water/Fuel Tanks	112500.00	129375.00	148781.25	171098.44	196763.20
Parts (per kg)	250.00	287.50	330.63	380.22	437.25

Assumption:

Prices are increased by 15% each year to offset inflation.

TABLE A-12:
PROJECTED REVENUES BY PRODUCT
(in thousands of Somali shillings)

	Year 1	Year 2	Year 3	Year 4	Year 5
Kitchen stoves (set of 3)	3600.00	5520.00	8252.40	9490.26	10913.80
Garbage containers	160.00	552.00	2116.00	3893.44	8395.23
Animal-drawn implements	5737.50	10557.00	20234.25	23269.39	26759.80
Corn Grinders	4000.00	5750.00	7935.00	9125.25	10494.04
Chopper/sickle	1975.00	3634.85	5223.87	7208.95	9810.18
Hoes, Spades, or Rakes	1966.75	3618.82	5202.05	7178.83	9769.20
Grates	400.00	552.00	740.60	973.36	1259.28
Water/Fuel Tanks	9000.00	12937.50	17853.75	25664.77	29514.48
Parts	3650.00	5865.00	8450.77	10554.87	13187.51
Sub total	30489.25	48986.32	76008.70	97359.12	120103.51
Repairs	1524.46	3429.04	7600.87	9735.91	12010.35
TOTAL REVENUES	32013.71	52415.36	83609.57	107095.03	132113.86

APPENDIX IV:
THE COST ANALYSIS

The following is an item-by-item description of the methodology, assumptions, and sources used to calculate the costs of each input item. The prices used are shown in Table A-15. The total requirements as calculated are shown in Table A-16. Table A-17 shows the resulting total material and energy input costs. Finally, Table A-18 shows the foreign exchange requirements.

Cast Iron

We calculated the yearly liquid output of cast iron by adding rejects to the final production. (See Table A-13.) Subsequently, we calculated the quantities of input needed by using the following information and making the following assumptions:

<u>Information/Assumption</u>	<u>Source</u>
o It takes 1.4 MT of metallic charge to produce 1 MT of liquid output.	Living Consultant Group (LCG)
o Returns provide for 24% of the metallic charge.	LCG
o 41% of the metallic charge consists of scrap (purchased locally).	LCG
o Scrap price: SS 15,000/MT.	Somali scrap dealers
o 35% of the metallic charge consists of pig iron (all imported).	LCG

Non-Ferrous Metals

Using the liquid output numbers as shown in Table A-13, we calculated the quantities of input needed as follows:

<u>Information/Assumption</u>	<u>Source</u>
o 1 MT of liquid output requires 2 MT of metallic charge.	LCG

- o 45% of the metallic charge consists of recycled metal, 45% of scrap (purchased locally), and 10% of imported metal billets. LCG
- o Scrap prices: Aluminum: SS 30,000/MT
Copper: SS 50,000/MT Somali scrap dealers
- o Copper castings account for 80% of non-ferrous castings, aluminum, 20% Assumption

Metal Fabrication

The following products are fabricated from metal: garbage containers, water and fuel tanks, animal-drawn implements, tools (hoes, spades, rakes). Table A-14 shows projected output in metric tons for each item. We calculated the quantities of input needed as follows:

<u>Information/Assumption</u>	<u>Source</u>
o Garbage containers and tanks are made out of sheet metal (all imported).	Assumption
o Each animal-drawn implement contains 3 kg of high carbon steel. Scrap steel accounts for the rest.	Assumption
o Tools are made of scrap steel.	Assumption
o Scrap steel price: SS 20,000/MT	Somali scrap dealers
o Wastage rates: sheet metal: 10% high carbon steel: 3% scrap steel: 10%	Assumption

Coke/Charcoal

For the calculation of coke and charcoal requirements, the following information and assumptions were used:

<u>Information/Assumption</u>	<u>Source</u>
o Coke has four times the heating efficiency of charcoal.	LCG
o Coke and charcoal requirements are 100 kg and 400 kg per MT of liquid output when used independently.	LCG

o FMW is using 50% coke, 50% charcoal.

Assumption

o Price of charcoal: SS 6,000/MT.

World Bank

Electricity

We assume that FMW uses 1,403 kwh per MT of production (source: LCG). Currently, the price of electricity to industrial consumers is SS 2.80/kwh. However, we assume that the recommendation from the World Bank to substantially increase electricity prices will be implemented gradually.

Chemicals

We assume that FMW uses 50.kg of chemicals per MT of liquid output (sources: LCG; FMW; private Somali foundry, "Fonderia", in Mogadishu) and we use an average price of US \$240/MT cif Mogadishu.

TABLE A-13:
LIQUID OUTPUT OF FOUNDRY*
(in metric tons)

	Year 1	Year 2	Year 3	Year 4	Year 5
Cast iron	80.3	110.2	136.7	148.5	161.4
Aluminum	3.2	4.4	5.5	5.9	6.4
Copper	<u>12.9</u>	<u>17.6</u>	<u>21.9</u>	<u>23.8</u>	<u>25.8</u>
Total	96.4	132.2	164.1	178.2	193.6

* Liquid output of the foundry is calculated by adding rejects to the final production; the reject rate is assumed to be: 10% in Year 1; 8% in Year 2; and 7% in the following years. (Source: "Foundry Design and Equipment Selection in Developing Countries" USAID. 1976.)

TABLE A-14
PROJECTED OUTPUT IN METRIC TONS

	Year 1	Year 2	Year 3	Year 4	Year 5
Kitchen stoves (set of 3)	27.00	36.00	46.80	46.80	46.80
Garbage containers	1.00	3.00	10.00	16.00	30.00
Animal-drawn implements	21.56	34.50	57.50	57.50	57.50
Corn Grinders	16.00	20.00	24.00	24.00	24.00
Chopper/sickle	25.00	40.00	50.00	60.00	71.00
Hoes, Spades, or Rakes	25.00	40.00	50.00	60.00	71.00
Grates	5.00	6.00	7.00	8.00	9.00
Water/Fuel Tanks	60.00	75.00	90.00	112.50	112.50
Total parts	14.60	20.40	25.56	27.76	30.16
Parts-Aluminum	2.92	4.08	5.11	5.55	6.03
Parts-Copper	11.68	16.32	20.45	22.21	24.13
TOTAL WEIGHT OF PRODUCTION	195.16	274.90	360.86	412.56	451.96

TABLE A-15

MATERIAL AND ENERGY INPUT PRICES
(in Somali shillings per MT)

	Year 1	Year 2	Year 3	Year 4	Year 5
Iron					
Purchased scrap	15000	16500	18150	19965	21962
Purchased pig iron	21500	26875	33594	41992	52490
Sheet metal	35500	44375	55469	69336	86670
HC steel	86000	107500	134375	167969	209961
Scrap steel	20000	22000	24200	26620	29282
Aluminum					
Purchased scrap	30000	33000	36300	39930	43923
Imported	176000	220000	275000	343750	429688
Copper					
Purchased scrap	50000	55000	60500	66550	73205
Imported	244000	305000	381250	476563	595703
Coke	18000	22500	28125	35156	43945
Charcoal	6000	6600	7260	7986	8785
Electricity (per Kwh)	4.2	4.5	4.8	5.0	5.0
Chemicals	34680.0	43350	54188	67734	84668

Assumptions:

1. Prices reflect October 1985 trading prices plus adjustments for shipping.
2. The exchange rate is assumed to be SS 85 per US dollar in Year 1.
3. Domestic input prices increase by 10% annually and imported input prices increase by 25% annually.
4. The exchange rate is free and the SS devalues by 20% per year.
5. The total of import duties, port and delivery charges are equal to 70% of the cif price.
6. All scrap is purchased domestically and all pig iron is imported.
7. Imported pig iron--US\$ 150 per MT (cif Mogadishu).
8. Imported sheet metal--US\$ 246 per MT (cif Mogadishu).
9. Imported high carbon steel--US\$ 600 per MT (cif Mogadishu).
10. Imported aluminum--US\$ 1220 per MT (cif Mogadishu).
11. Imported copper--US\$ 1680 per MT (cif Mogadishu).
12. All coke is imported--US\$ 125 per MT (cif Mogadishu).
13. All charcoal is purchased domestically.
14. Electricity prices reflect World Bank recommendations.
15. All chemicals are imported--US\$ 240 per MT (cif Mogadishu).

TABLE A-16
MATERIAL AND ENERGY INPUT REQUIREMENTS
(in metric tons)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total iron	112.4	154.2	191.4	207.9	225.9
Recycled (24%)	27.0	37.0	45.9	49.9	54.2
Purchased scrap (41%)	46.1	63.2	78.5	85.2	92.6
Purchased pig iron (35%)	39.3	54.0	67.0	72.8	79.1
Sheet metal	67.1	85.8	110	141.35	156.75
HC steel	2.3	3.6	6.0	6.0	6.0
Steel from scrap	48.8	78.2	111.9	122.0	135.0
Aluminum	6.4	8.8	10.9	11.9	12.9
Recycled (45%)	2.9	4.0	4.9	5.3	5.8
Purchased scrap (45%)	2.9	4.0	4.9	5.3	5.8
Imported (10%)	0.6	0.9	1.1	1.2	1.3
Copper	25.8	35.3	43.8	47.6	51.6
Recycled (45%)	11.6	15.9	19.7	21.4	23.2
Purchased scrap (45%)	11.6	15.9	19.7	21.4	23.2
Imported (10%)	2.6	3.5	4.4	4.8	5.2
Coke	4.8	6.6	8.2	8.9	9.7
Charcoal	19.3	26.4	32.8	35.6	38.7
Electricity (Kwh)	286103	399423	521348	595180	651872
Chemicals	4.8	6.6	8.2	8.9	9.7

Assumptions:

1. Metallic inputs to the foundry are calculated by multiplying liquid output by the metallic input/output ratios: 1.4 for cast iron; 2 for aluminum and copper.
2. Wastage of sheet metal and scrap steel is 10% every year.
3. Wastage of high carbon steel is 3% every year.
4. Coke has four times the heating efficiency of charcoal.
5. Coke and charcoal requirements are 100 Kg and 400 Kg per MT of liquid output when used independently.
6. The foundry is using 50% coke and 50% charcoal.
7. FMW uses 1403 Kwh per MT of production.
8. Chemicals are used at a rate of 50 kg per MT of liquid output.

TABLE A-17

MATERIAL AND ENERGY INPUT COSTS
(in thousands of Somali shillings)

	Year 1	Year 2	Year 3	Year 4	Year 5
Total iron					
Recycled	-0-	-0-	-0-	-0-	-0-
Purchased scrap	691.38	1043.33	1424.63	1701.98	2034.04
Purchased pig iron	845.96	1450.67	2250.97	3055.89	4150.11
Sheet metal	2382.05	3807.38	6101.56	9800.63	13585.51
HC steel	194.71	389.42	811.29	1014.11	1267.64
Steel from scrap	976.94	1719.41	2708.59	3272.26	3953.80
Aluminum					
Recycled	-0-	-0-	-0-	-0-	-0-
Purchased scrap	86.72	130.87	178.70	213.49	255.14
Imported	113.06	193.88	300.84	408.42	554.66
Copper					
Recycled	-0-	-0-	-0-	-0-	-0-
Purchased scrap	578.16	872.47	1191.33	1423.26	1700.94
Imported	626.98	1075.16	1668.30	2264.87	3075.85
Coke	86.72	148.72	230.76	313.28	425.45
Charcoal	115.63	174.49	238.27	284.65	340.19
Electricity (Kwh)	1201.63	1797.40	2476.40	2975.90	3259.36
Chemicals	167.09	286.53	444.60	603.58	819.70
Auxiliary materials and diesel fuel	1879.78	3050.17	4666.51	6368.98	8254.12
TOTAL COSTS	9946.83	16139.88	24692.75	33701.30	43676.51

Assumptions:

1. Auxilliary materials such as lining material for the furnaces, sand, welding rods, drilling bits, wood, and diesel fuel represent 18.9% of all input costs.
2. Fifty percent of auxilliary materials are imported.

TABLE A-18
FOREIGN EXCHANGE REQUIREMENTS
(in U.S. \$)

	Year 1	Year 2	Year 3	Year 4	Year 5
Imported M/E Inputs	37,069	50,075	66,516	81,046	91,616
Expatriate Salaries	62,400	62,400	24,000	0	0
Misc. Operating Expenses	16,950	23,124	30,738	32,811	33,730
Financial Expenses	27,073	27,073	27,073	27,073	27,073
TOTAL (including Financial Expenses)	143,492	162,672	148,327	140,930	152,419
% of Total Expenses	36%	33%	27%	25%	26%
TOTAL (excluding Financial Expenses)	116,419	135,599	121,254	113,857	125,346
% of Total Expenses	28%	28%	22%	20%	21%

Assumptions and Notes:

1. Foreign exchange requirements for M/E Inputs are to cover only cif prices and not the full costs of the inputs that include port charges, import duties, and delivery charges.
2. The exchange rate in Year 1 is SS 85 per US \$ and the SS devalues by 20% annually.
3. Thirty percent of miscellaneous operating expenses require foreign exchange, such as spare parts, repairs and maintenance, etc.

APPENDIX V:
ACCOUNTING ISSUES FOR FOREIGN INVESTORS

Conceivably, the privatization of FMW could result in a non-Somali firm's taking over ownership and/or operation of the facility. In either case, such a situation creates certain accounting and record-keeping problems not encountered if a national is the investor. To get an idea of the magnitude of these problems, we contracted with Alexander Grant and Co., which is part of the Grant Thornton International worldwide group of accounting firms, to answer some specific questions.

Question #1 - What method of inflation accounting would be used in view of the fact that Somalia has been experiencing inflation rates at around 60%?

In accordance with Financial Accounting Standards number 52 (FAS 52, "Foreign Currency Translation"), translation of operations in highly inflationary economies requires special considerations. A highly inflationary economy is generally defined as one that has cumulative inflation of approximately 100% or more over a three-year period. In some cases, the "trend" of inflation might be as important as the absolute rate. In all cases, proper judgement must be applied in defining a highly inflationary economy. It is evident that there has been an upward trend in Somalia's inflation figures as reflected by the general price indices for the years 1975 through 1984, with a cumulative factor of approximately 162% over the past three years, 1982 through 1984, inclusive. Given this pattern, Somalia's economy should be considered highly inflationary for the purpose of applying FAS 52.

Financial statements of a foreign entity must first be remeasured into "functional" currency and then translated into the "reporting" cur-

rency. An entity's functional currency is the currency of the primary economic environment in which the entity operates, normally the currency of the environment in which the entity primarily generates and expends cash. The reporting currency is the currency of the investor who is translating the foreign entity's financial statements for purposes of consolidation, combination or reporting under the equity method. Given a scenario of a U.S. investor, the dollar would be the reporting currency.

Under the guidance of FAS 52, the financial statements of a foreign entity in a highly inflationary economy must be remeasured as if the functional currency were the reporting currency. In any historical cost model, a reasonably stable measuring unit is an essential ingredient to useful reporting of financial position and results of operations. Any degree of inflation affects the usefulness of financial information measured in nominal currency units. If historical costs are measured in such units within a highly inflationary environment, those measures of historical cost rapidly lose relevance. Such is the case here, so the Somalian financial information would have to be remeasured using the reporting currency of the investor. Note that if the foreign entity's functional currency is deemed to be the reporting currency, remeasurement into the reporting currency makes unnecessary a separate translation adjustment. Any adjustment resulting from the remeasurement process must be included in the determination of remeasured net income.

To accomplish the remeasurement process, it is necessary to apply both current and historical exchange rates. The current exchange rate is the rate that is most current at the date of remeasurement, i.e., the balance sheet date, and historical exchange rates are the actual rates in effect at the date of a given transaction. Historical rates are used to produce

the same result in terms of the functional currency (which in Somalia's case is the reporting currency) that would have occurred if those items had been initially recorded in the functional currency (again, which is the reporting currency in this case). Specific accounts to be remeasured using historical exchange rates include the following:

Marketable securities carried at cost	Common stock
Inventories carried at cost	Preferred stock carried at
Prepaid expenses	insurance
Property, plant and equipment	Cost of goods sold
Accumulated depreciation	Depreciation expense
Intangible assets	Amortization expense
Certain deferred charges and credits	

Question #2 - To establish true profits, what method should be used to establish costs of goods sold?

Foreign financial statements must be in conformity with generally accepted accounting principles (GAAP) before they are remeasured or translated. This would include recording inventory and the related cost of inventory production and cost of sales using an historical cost concept with consideration given to ultimate valuation at historical cost or market, whichever is lower. In addition, an inventory flow method (such as First in First Out (FIFO), Last in First Out (LIFO) or average cost) must be used consistently. Cost of sales should ultimately be defined as beginning inventory plus purchases less ending inventory.

Given that the Somali economy is a highly inflationary one, FAS 52 requires the remeasurement of inventory and cost of sales using the reporting entity's (investor's) historical exchange rates to produce the same results as if the foreign entity's books of record had been initially recorded in the reporting currency. Average historical exchange rates may be used, but should be appropriately weighted by the volume of transactions occurring during the accounting period. Inventory and costs of

sales transactions for a given month or quarter may be remeasured at that month's or quarter's average rate. These amounts should then be totalled for the annual result. It is necessary to recognize currently in net income all gains and losses resulting from the remeasurement process.

The lower-of-cost-or-market concept would require special considerations given the Somali inflationary economy. Inventories and cost of sales must first be remeasured to reflect the reporting entity's cost and the remeasured historical cost is compared to the market as stated in functional currency (in this case, the reporting entity's currency). Any resulting write-down must be recorded in current operations. The resulting adjusted carrying amount of the inventory shall continue to be the carrying amount until the inventory is sold or adjusted further.

Question #3 - In the past, FMW has procured a significant portion of its equipment, spare parts, and raw materials from such countries as Yugoslavia and West Germany. This high dependency on foreign sourcing will continue. The value of the Somali currency as expressed in U.S. dollars has declined sharply in recent years and may continue to do so. How would you account for these factors in the financial statements, specifically in the valuation of inventory, plant and equipment and depreciation?

Because the Somali economy is highly inflationary, all transactions relating to inventory, plant and equipment, and depreciation, as reflected in the books and records of the Somali company, would be remeasured using the historical exchange rates of the reporting entity (investor) in order to present results of operations and financial condition as if all the transactions relating to these accounts were initially recorded in the functional currency. Again, in high inflation, functional currency is deemed the reporting entity's currency. As noted earlier, additional special consideration must be given in the determination of lower-of-cost-or-market valuation of inventory.

Question #4 - How would you adjust the financial statements to account for the combined factors of high inflation rate and sharp currency fluctuation?

As previously discussed, the books and records of the Somali company would be remeasured using the current or historical exchange rates of the reporting entity. Any resulting gain or loss from the remeasurement process would be reflected as a charge or credit to current operations.

FAS 52 permits the use of average exchange rates to remeasure and translate financial information. The effect of currency fluctuations should be appropriately weighted by the volume of transactions. Averages can be computed weekly, monthly, quarterly or for any other relevant time period, giving effect to the degree of currency fluctuation.

Question #5 - How would you translate financial statements from the sharply fluctuating Somali currency into U.S. dollars? Specifically, what exchange rate should be used: the official rate of 1USD = SS 36; the "official free market" rate of 1USD = SS 84; or the tacitly approved free market rate 1USD = SS 90 - 94? (Rates as of May, '85)

FAS 52 specifically requires that, in the absence of unusual circumstances, the rate applicable to conversion of a currency for purposes of dividend remittances shall be used to translate foreign currency statements. However, political instability or economic disruption may make it impossible to compute meaningful exchange rates. In such cases, earnings of a foreign investment should be recognized by the reporting entity only to the extent that cash has been received in unrestricted funds. Careful consideration should be given in this case due to the various and distinct exchange rates. An inaccessible rate or a "black market" rate always should be avoided. The tacitly approved free market rate appears to be the most accessible and appropriate for conversion of a currency for purposes of dividend remittances, assuming the completion of the privatization of the state-owned foundry.

Question #6 - What method would you use to determine the salvage value of plant and equipment in the described environment?

Residual value is the estimated amount that may be recovered through sale, trade-in allowance, or by other means when the asset is finally retired from service. In estimating the residual value, allowance must be made for the costs associated with dismantling and disposal of the retired asset. The evaluation of the overall residual value becomes increasingly difficult in an environment with sharp fluctuations in market and political conditions. Any subsequent change in the estimate of residual value should be accounted for prospectively as a change in accounting estimate by adjusting the undepreciated balance and future depreciation expense.

Generally accepted accounting principles would require that management of the Somali company properly evaluate true residual value in its functional currency before the remeasurement and translation process begins. Because FAS 52 requires that property, plant and equipment, and the related depreciation be remeasured in terms of the reporting entity's currency (highly inflationary economy), the salvage value of the reporting entity must also be remeasured in determining the remeasured depreciable base. This would be done using the same historical exchange rates used in remeasuring the property, plant and equipment, and depreciation accounts.

BIBLIOGRAPHY

- African and Exchange and Trade Relations Departments. "Somalia, Review of Stand-By Arrangement." Washington, D.C.: International Monetary Fund. July, 1983.
- Agency for International Development (US). "Country Development Strategy Statement, FY 1987: Somalia." Washington, D.C.: USAID. January, 1985.
- Ahmed, Zia Udden. "The Foundry and Mechanical Workshop." A Casebook of Public Enterprise Studies. International Center for Public Enterprises in Developing Countries. Presented at ICPE's National Workshop of Public Enterprises, Mogadishu, 9-13 August, 1981.
- Central Statistical Department. "1981 Industrial Production Survey." Mogadishu: Somali Ministry of National Planning. July, 1985.
- Duvigneau, J. Christian and Ranga N. Prasad. Guidelines for Calculating Financial and Economic Rates of Return for DFC Projects. Washington, D.C.: The World Bank. 1984.
- Eliot Berg Assoc. "Encouraging the Private Sector in Somalia." Alexandria, VA: Berg. September, 1982.
- Fahmy, Fawzi. "Appraisal of Five-Year Development Programme, 1974-1978 (Industrial Sector)." NY: UNIDO. August 20, 1979.
- German Agency for Technical Cooperation (GTZ). "Project Proposal: Wind Pump and Solar Pump Pilot Projects for the Drinking Water Supply in Rural Regions of Somalia." GTZ. October, 1983.
- German Development Inst. (GDI). "The Private Manufacturing Sector in Somalia." Berlin: GDI. September, 1984.
- GOPA Consultants. "Evaluation of Possibilities for Hollow Glass Manufacturing in the Somali Democratic Republic. Feasibility Study, May, 1981." Eschborn, West Germany: GOPA (under contract to the German Agency for Technical Cooperation [GTZ]). March, 1981.
- International Bank for Reconstruction and Development and UN Development Program. "Somalia: Issues and Options in the Energy Sector." Washington, D.C.: The World Bank. August, 1985.
- International Development Association. "Report and Recommendation of the President of the International Development Association to the Executive Directors on a Proposed SDR 10.1 Million (US \$10.0 million) Credit to the Somali Democratic Republic for an Agricultural Inputs Program." Washington, D.C.: The World Bank. May 28, 1985.
- International Monetary Fund. "Tax Survey." Washington, D.C.: IMF. 1980-81.
- Investment Advisory Centre of Pakistan. "Feasibility Study for Setting-up a Mini-Steel and Rolling Mills in Somalia." Pakistan. 1979

- Investment Promotion Conference, 6-9 November, 1983. "Report on the Proceedings." Mogadishu: State Printing Office. May, 1984.
- Jeweyni, G. H. "Report to the Governor, Central Bank of Somalia, April, 1983." Washington, D.C.: International Monetary Fund. April, 1983.
- Kienbaum Beratungen. "Study for Progressive Local Manufacture of Pumps (Supplementary Assistance to the Mechanical Workshop and Foundry) in the Somali Democratic Republic." Mogadiscio/Gummersback: Kienbaum Beratungen. August, 1979.
- Harvard Institute for International Development. "Quantitative Analysis of Incentives and Disincentives for Expansion of Industrial Output and Employment in Somalia." (A Report to USAID pursuant to Contract No. DAN-5426-C-00-4098-0.) Cambridge, MA: HIID. July, 1985.
- Lanchava, Manuchar D. "Foundry and Mechanical Workshop Project, Final Report." Mogadiscio: UNIDO/UNDP. 1976.
- Living Consultant Group. "Final Project Report for the Construction of the Foundry and Machining Shop - Somalia." Sarajevo, Yugoslavia: Living Consultant Group. 1972.
- Mohamed, Faiza Jama. "Office Management in Somalia - Comparative Study in the Public and Private Sector." Khartoum: University of Sudan Doctoral dissertation. 1982.
- Nsouli, S. M., N. Calika, et al. "Somalia, Recent Economic Developments." Washington, D.C.: International Monetary Fund. February, 1983.
- Potter, John B. and Fred Mejavenadem. "Foundry Design and Equipment Selection in Developing Countries." Washington, D.C.: Office of Science and Technology, USAID. December, 1976.
- Project Management Unit. "Somali Democratic Republic: Agricultural Extension and Farm Management Training Project; Half-Yearly Progress Report, July-December, 1984." Mogadishu: Govt. of the Somali Democratic Republic. 1984.
- Rao, Swamy. "Report of the Mission to the Somali Democratic Republic - Mogadiscio, 16-24 April, 1985: Agricultural Tools, Implements, and Machinery." Vienna, Austria: UNDP and UNIDO. 29 May, 1985.
- TDRI. "The Charcoal Industry in Somalia: A Techno-Economic Appraisal." February, 1984.
- UN Conference on the Least Developed Countries. "Presentation on Somalia." NY: UN. January, 1981.
- UN Development Programme. "Somalia, Annual Development Report, 1984." Mogadishu: UNDP. June, 1985.
- UN Environmental Programme. "Environmental Aspects of Iron and Steel Production." NY: UNEP. 1984.

- UN Industrial Development Programme (UNIDO). "1990 Scenarios for the Iron and Steel Industries -- Third Consultation on the Iron and Steel Industry, Caracas, Venezuela, September, 1982." NY: UNIDO. 1982.
- _____. "The Potential for Resource-based Industrial Development in Least Developed Countries. No. 6., Somalia." NY: UNIDO. December, 1983.
- _____. "Joint Mission Report to Somalia from 13 April to 20 April, 1977 of Messrs. H. J. Fritz, Engineering Industries Section and B. Crowston, Metallurgical Industries Section." NY: UNIDO. 1977.
- _____. "FMW Systems and Procedures. Instructional Manual Prepared by K. W. Watkins, Industrial Management Advisor." NY: UNIDO. September, 1976.
- UNDP. "Assistance to the Foundry and Mechanical Workshop (FMW), Mogadiscio - Project Manager." NY: UNIDO/UNDP Project of the Government of the Somali Democratic Republic, Project Document. February, 1985.
- _____. "Foundry and Mechanical Workshop - Phase II." NY: UNIDO/UNDP Project of the Government of Somali Democratic Republic, Project Document. 1978-1979.
- _____. "Accounting System, Procedure, Controls and Financial Management in Public Enterprises. Report Prepared for the Ministry of Industry, Somali Democratic Republic." NY: UNIDO/UNDP. November, 1979.
- World Bank, Eastern and Southern Africa Regional Office. "Somalia: Maintaining the Recovery Program, Report #5584-SO." Washington, D.C.: The World Bank. June 4, 1985.
- Zulu, Justin B. and Saleh M. Nsouli. "Adjustment Programs in Africa, the Recent Experience." Occasional Paper #34. Washington, D.C.: International Monetary Fund. April, 1985.

LEGISLATION AND CONTRACTS REVIEWED

Contract, Dated 27 November, 1981, at Bonn, between the Federal Republic of Germany and the Somali Democratic Republic to "intensify economic cooperation between both states," etc.

Government of the Somali Democratic Republic (GSDR), Law #26 of 5 July, 1984 "governing the workers of parastatal industries."

Somali Republic Body of Laws on Direct Taxation, 5 November, 1966.

GSDR Decree #3, 23 March, 1985: Revision on Production Tax.

GSDR, "Bollettino Ufficiale, Anno IV, Suppl. No. 3 - 10," 25 October, 1972: First Part, Legislative and Administrative Acts: Law No. 65 of 18 October, 1972, Labour Code.

GSDR: First Part, Legislative and Administrative Acts: Law No. 58 of 31 July, 1972, Finance of Public Enterprises and Agencies.

GSDR: Law No. 7 of 29 January, 1977 - Foreign Investment.