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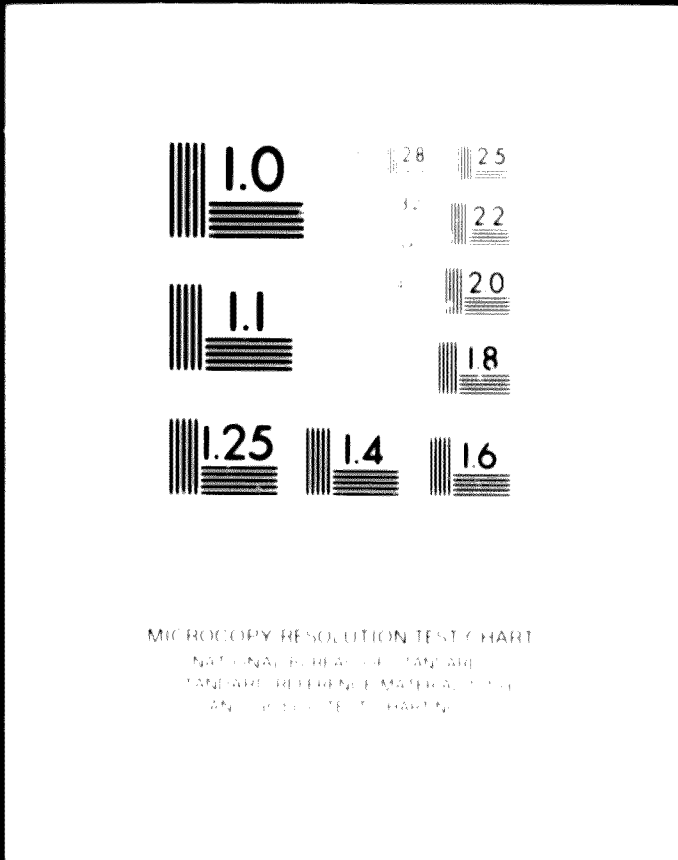
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MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A  
STANDARD REFERENCE MATERIAL 1010  
ANALYTICAL TEST CHART-N

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UNITED NATIONS INDUSTRIAL DEVELOPMENT  
ORGANIZATION

FINAL REPORT

RESTRICTED

Afghanistan

On Job: AFG-056-D, with the Planning and Projects  
Department of the Royal Afghan Ministry of Mines  
and Industries, Kabul. (March 5 1967 - January 21,  
1968)

Submitted by: Mr. Stanko M. TSZAK, UNIDO -  
Expert in Kabul

February 1968

"This report has not been cleared with Industrial  
Development Organization of the United Nations,  
which does not therefore necessarily share the  
views expressed".

Delivered to: Mr. Rothblum, Chief  
Section for Asia and the Far East  
UNIDO - Vienna

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**JOB DESCRIPTION**

**PROJECT:** 155-63; Ind. Dev. and Prod. - AFGHANISTAN

**Job Description:** AFG-056-D - Afghanistan

**Post title:** Industrial Engineer

**Durations:** One year, with possibility of extension

**Date required:** As soon as possible

**Duty Station:** Kabul

**Duties:** The expert will advise the Plans and Project Department (Industrial Section) of the Ministry of Mines and Industries on the planning and co-ordination of industrial projects. He will be expected to advise on feasibility studies for specific industries including factory planning; working out specifications to suppliers; economic and technical evaluation of offers from suppliers; and follow-up of project implementation.

The expert will also train counterpart personnel of the Department in the performance of the above tasks.

**Qualifications:** Industrial consultant or industrial engineer with wide experience in industrial engineering covering particularly such fields as factory layout, production planning and methods of engineering.

**Language:** English essential; German desirable

**Background Information:** The expert will be assigned to the Planning and Projects Department of the Ministry of Mines and Industries which was recently reorganized with the aid of another United Nations expert, who also heads this Department. At present no experienced nationals are available to staff the Department which will assist in preparing the industrial development portion of the third five-year plan (1967-1972)

## FOREWORD

According to the Job Description, an industrial engineer - economist was to be assigned to the Planning and Project Department of the Royal Afghan Ministry of Mines and Industries, in Kabul, Afghanistan, in the capacity of an Industrial and Economic Advisor.

Mr. Sh. M. Attiqi, Mechanical and Electrical Engineer was the permanent governmental counterpart. Messrs. Sabour and Tahir have been the counterparts for half a year each.

H. B. Ing., A. N. Saleem, Minister, and Dr. A. Akbar, Deputy Minister, were responsible for this job on the part of the Afghan government.

The basic task was to advise the Planning and Project Department on the methods and ways of planning and co-ordinating industrial projects and ventures. Feasibility studies and reports for specific industries covering questions such as factory planning, specifications for installations and evaluation of offers were to be prepared. Profitability studies on textile, edible oil and iron projects to be recommended to be established during the Third Five year Plan of Afghanistan's development were also to be submitted. Preparation of contracts for construction of plants and factories on a "turnkey" basis, as well as for textile machinery, oil refinery plants and other installations was also to be covered.

National counterparts were to be trained in the field of general economics, follow-up of project implementation and all above specified activities.

Resolving of actual problems and answering technical and economic queries involving the existing Afghan industrial enterprises and companies constituted a significant part of the field assigned.

## DESCRIPTION OF WORK PERFORMED

The new Foreign and Domestic Private Investment Law went into force on 1st Hoot 1345 - January 1967. This law provided five-year exemption from all taxes and import duties for all business ventures as well as for other opportunities to promote foreign investors. In September 1967 the Investment Committee (No. 310 of 14th September 1967) recommended that the original Investment Law which ensured a five-year exemption to be modified to provide for a ten-year exemption. The entire work performed by the expert was based on the above law and was governed by the specific conditions in Afghanistan during the 1967/68 period.

## THE MODEL METHOD

The rising demands for investments in industry necessitated the development of a more convenient method for estimating and evaluating existing and future ventures and projects. Therefore, a means for evaluating such investments (based on the information given in an article in the German Journal "Stahl und Eisen" 1(1965 p.1.) was introduced in this report. The method is designed to be applicable to all types of industries and investment ventures.

Prior to describing this method, the so-called "Model Method", the terms and notions used in investment calculations and evaluations should be reviewed. They are as follows:

- "Investment Capital" represents the money or performed work invested or engaged in real estate and other property. Included here are cash, expenditures, as well as interests accumulated during the implementation of investment ventures or projects. Land, buildings, machinery, devices, equipment, services, sometimes called fixed capital or fixed assets; and the working capital (interests and other money obligations) called liquid assets, are also considered investment capital.



- 4
- "Net Sales" are the revenues collected during a fiscal year for sold goods or services.
  - "Annual Operating Costs" are the total expenses incurred during a fiscal year for raw materials, supplies, power, water, fuel, transportation, labour and other costs such as sales costs, cost of advertising, travel, freight, storage, miscellaneous contingencies, sub-contracting, etc.
  - "Gross Profit" is the net difference that remains after the deduction of operating costs, taxes and other legal obligations from the net sales. Expressions such as "collected funds", "total profit" or "treasury" correspond to the same term as gross profit.
  - "Net Profit" is equivalent to gross profit minus costs of depreciation, interest, annuities, etc.
  - Under the term of "useful life", the life of a factory or an investment project is understood. It is directly related to depreciation or to a period during which the real and other property are depreciated.

An investment venture or project depends upon the assumed value of the return on investment and the available capital. It is profitable when:

1. The net profit is positive, i.e. its value is equal to or greater than zero.
2. The Internal Interest Rate, which is defined as a quotient between the gross profit and the investment capital is equal to or higher than the assumed one.

If the above two conditions are fulfilled, the invested capital will be recovered and an additional capital equal to the depreciation value will also be created during the useful life of the project.

It may be interesting to note that some theories consider an investment project profitable when it assures the recovery of the invested capital only in a certain period of time and at a certain interest rate.

To understand the movement of capital during the useful or proposed life of an investment project, a graphical interpretation of investment calculations and results has been elaborated. The movement of capital, i.e. the recovery of capital in the period of useful life and at a specific interest rate is composed of successive capitals created during that period. These capitals are calculated from uniform investment series, based on the internal interest rates. The capital value can thus be expressed by the following equation:

$$\text{Capital Value} = \text{Gross Profit} \times \frac{(1+i)^n - 1}{i(1+i)^n} - \text{Investment Capital}$$

When the Capital Value in this equation becomes zero after a number of years at certain interest rates, the invested capital is recovered.

In the above equation the "present worth factor" is expressed by:

$$\frac{(1+i)^n - 1}{i(1+i)^n}$$

where "i" represents the interest rate, and "n" the number of years after which the results of investments should be known. (The values of various mathematical factors used in investment calculations are provided in "SPITZER - FÜRSTER TABELLEN".)

The above theoretical explanations are applied to some hypothetical examples given below:

## INVESTMENT VENTURE I

### Assumptions

Investment capital	100 units
Depreciation value	90%
Gross profit	10%
Interest rate	0%; (3%; 6%)

No taxes and other obligations; Investment capital paid in cash.

### Discussion of the venture

In this case the invested capital will be recovered in ten years

$$100 \text{ (Investment capital)} : 10 \text{ (Gross profit rate)} = \\ = 10 \text{ (years)}$$

To achieve the depreciation value of 90% it is necessary to run the production for an additional period of time, i.e. for

$$90 \text{ (Depreciation rate)} : 10 \text{ (Gross Profit Rate)} = \\ = 9 \text{ (years)}$$

To recover the capital and depreciate the assets a total of  $10 + 9 = 19$  years is necessary.

If the above results are transferred on to a graph, a line which begins at a point of capital value "-100" crosses the useful life line at the end of the 10th year, and indicates that the 90% depreciation would be achieved after 19 years.

/The ordinate (vertical axis) represents the capital values and the abscissa (horizontal axis) the useful or proposed life of the project./



With the same assumptions as above, but at an interest rate of 6%, a capital recovery point is moving further ahead on the horizontal axis. The points can be calculated and are plotted on to a graph, and the result is the curve marked "0.100/6" (Graph No. 1). All calculations have been performed by means of the Spitzer-Fürster Tables.

The capital movement curve now crosses the "zero line" during the 15th to 16th year. To achieve the depreciation value of 90, more than 100 years would be needed.

The third case, based upon the same assumptions, but at an interest rate of 3% is represented by a new curve shown on Graph No. 1, which lies between the first two curves.

The three curves in Graph No. 1 reflect the general idea of capital movement in time and value.

The distances between the points on the 0% interest line and the corresponding points on the 3% and 6% curves indicate the interest value created in a certain time period. So, after 10 years production, about 26 units of capital at an interest rate of 6% are achieved. Similarly, other values can be calculated or obtained accordingly from the graphs.

## INVESTMENT VENTURE II

### Assumptions

Investment capital            100 units  
 Depreciation value            90%

Gross profit: three alternatives:

a)                                10%  
 b)                                20%  
 c)                                30%

Interest rate                    6%

No taxes and other obligations. Investment capital is paid in cash.

The capital movements and the capital values under these assumptions follow the trend of the three curves shown in Graph No. 2. Additional points on the curves for greater values of useful life can be calculated if necessary.

The following conclusions result from the analysis of the graph:

- a) For a gross profit of only 1/10 of the invested capital, the internal interest rate is 0.100. At an interest rate of 6%, the recovery of capital can be expected in 15 to 16 years, while the projected depreciation value will be achieved in more than 100 years.
- b) At the gross profit rate of 20% of the invested capital, i.e. at the internal interest rate of 0.200, the capital will be recovered in 6 years, while the projected depreciation value will be achieved in about 15 years.
- c) At the gross profit rate of 30% of the invested capital, i.e. the internal rate of 0.300. The entire investment will be recovered in 4 years, and the projected depreciation value will be achieved in about 8 years.

These three instances frame practically all the possible cases which can occur in investment calculations. (Graph No. 2).

These calculations, when applied to Afghan conditions should be adjusted to reflect the situation at the time of investment.

These conditions are:

An average interest rate on loans and bank affairs is 6%

Loan repayment periods vary between 5 and 8 years, with an average of 7 years for larger investments.

Suggested depreciation value is 90% of the investment capital.

Suggested useful lives of projects in various industries are:

Textile	12 years
Food	15 years
Chemicals	10 years
Metal and Woodworkin,	12 to 15 years

On the basis of these four assumptions the lowest internal interest rate, i.e. the gross profit value can be determined. This can be useful when starting up a production or a business in determining the period of recovery and in indicating the time necessary to create equivalent capital of the depreciated value of assets. By knowing this gross profit value the destiny of the investment venture or project can be foreseen.

To have a profitable venture, however, the following conditions should be fulfilled:

- Invested capital should be recovered during the useful life of the project; and capital equivalent to the depreciation value should be created.

So, for the average Afghan conditions:

- Interest rate 6%
- Depreciation value 90%
- Capital recovery: at last 7 years
- Useful life 10, 12, 15 and 20 years

the internal interest rate, i.e. gross profit, is calculated as follows:

Useful life (in years)	Internal Interest Rate	Gross Profit (% of Invested Capital)	Time for Capital recovery (in years)
10	0.258	25.8	4 1/2
12	0.228	22.8	5 1/2
15	0.195	19.5	6 1/2
20	0.168	16.8	7 1/2
/32/	/0.136/	/13.6/	/10/

example: For a 10 year investment venture or a project based on average Afghan conditions, the gross profit should be at least 25.8%, or greater, to answer all the obligations resulting from that investment (Graph No. 2).

The internal interest rates, i.e., the gross profit rates are at the same time the breakeven points of profitability in above examples.

If the question of depreciation is eliminated, the following is the case:

Assumptions

Interest rate                    6%  
Investment capital            100 units  
Recovery of capital invested at least in 10 years

To fulfil the above-mentioned stipulations, the internal interest rate should be at least 0.136, which corresponds to a useful life of the venture of about 32 years, in the case when the depreciation is considered.

In the above example, the invested capital is recovered in 10 years but the venture of the project should be in operation for 22 years more to create a new depreciation value. Such an investment is profitable from a capital point of view but does not insure future self-financing of the venture.



Therefore, profitability stipulations dictate the level of capacities or the volume of business, which satisfy the lowest gross profit, i.e. internal interest rate under the existing market and political conditions.

All the above-mentioned and discussed basic investment calculations can be used to determine hypothetical models of an investment venture different from each other in capacity or performance, and to find out the lowest breakeven capacity for specific conditions.

They are the basis of the Model Method which is shown afterwards applied to some concrete cases.

## MARKETING STUDIES AND RESEARCH

To apply the Model Method and the related investment calculations and profitability analyses, the existing market situation and conditions must be known.

There is little marketing information available in the official statistics and the announced Afghan development plans. The only available statistical data were issued by the Ministry of Commerce and Planning. Even this had to be reviewed as some discrepancies were discovered in the course of this project.

In 1967/68 (1345/46) the results of a market-bazaar-research survey were published in official government publications. Other information was obtained from direct contact with government officials, wholesale traders, importers and exporters, and retail salesmen. On the basis of this information the following conclusions are drawn:

Official publications such as "Import and Export of Merchandise into Afghanistan" show that the movement of merchandise is from one half to one third lower than it actually is.

In this project the existing domestic production performance was scrutinized by the expert for the purpose of this study, and the results are summarized below:

<u>Merchandise</u> (Item)	<u>Consumption</u> (1967/68)	<u>Domestic Production</u> (in units)
- cotton cloth	120 to 140 million)	60 to 70 mill. m. meters
- rayon cloth	40 to 50 million)	less than 1 million meters
- edible oil & fat	50 to 60 thousand)	5 to 7 thousand tons (vegetable oil only)
- steel semi-products under the SICT Code Nos. 6911 and 6990	8 to 9 thousand)	Nil tons

The plant capacity of the textile industry is about 50 to 90 million meters per year. The edible vegetable oil and fat mills and refineries have a capacity of about 15,000 tons per year.

From the above mentioned, one can draw the conclusions that all new capacities and ventures foreseen in the Afghan development plan are realistic and they do not disturb the consumption/production balance.

In connection with the above investigations, the prices of final goods and products, raw materials, and supplies (including energy) have been studied.

The results of feasibility studies of some new industrial ventures to be materialized in Afghanistan in 1967/68 (or later) and the discussion of these results are shown in this report.

It is expected that the domestic consumption will increase at the rate of population increase, i.e. with the increase of the gross national product. (See chapter on Steel Industry)

It is to be stressed that this marketing was an entirely occasional one, and that it is necessary to organize a permanent marketing service to get the newest market situation. Furthermore, there is a growing need to establish a permanent market research service, which is necessitated by the overall development of the Afghan economy.

## TEXTILE INDUSTRY

Grey cotton cloth weaving mill

Question: What should be the lowest annual output of a grey cotton cloth weaving mill to work profitably?

To answer this question five "models" on the grey cotton cloth have been developed. All the basic data is given in Annex No. 1, while the final results are provided below:

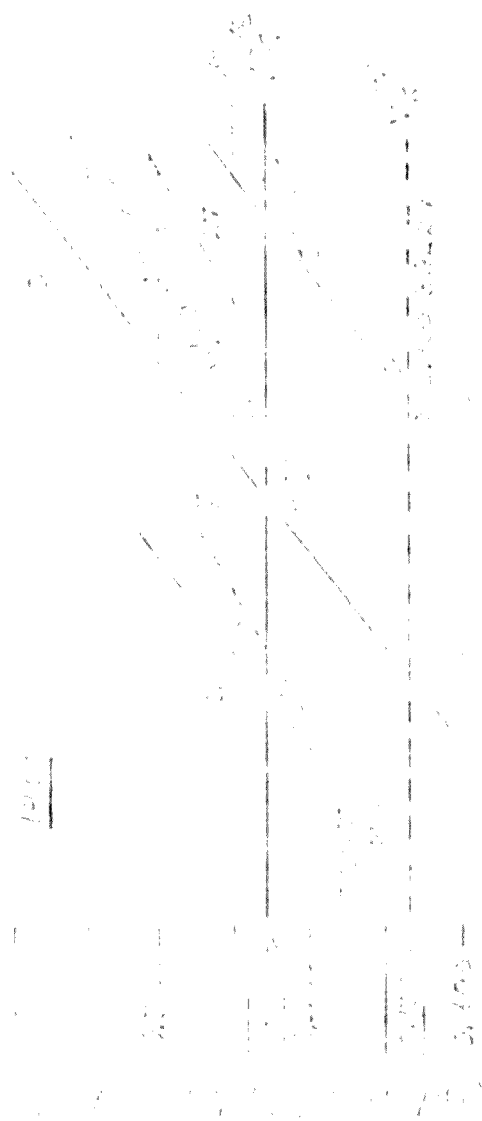
<u>Annual output (in meters)</u>		<u>Internal Interest Rate</u>
1,750,000	} calculated	0.078
3,500,000		0.146
7,000,000		0.209
10,000,000	} estimated	0.262
20,000,000		0.386

These results are also provided in Graph No. 3. The ordinate represents Internal Interest Rates on linear scale and the abscissa the outputs or capacities on a logarithmic scale.

In the same graph the horizontal lines represent the internal interest rates of 0.228 and 0.136. For safety purposes the internal interest rate is diminished by 25%. If all these results are plotted, two lines are obtained and points where these lines cross the internal interest lines of the corresponding output (capacity) can be read from the graph.

In Graph No. 3, these two lines - "Cotton Weaving, only" - cross the Internal Interest Rate Line "0.136 - V 10/6" at the points corresponding to the output value 3.2 and 4.6 (million meters). The Internal Interest Rate Line "0.228", representing a capital recovery and creation of a new depreciation value occurring in 12 years (which is the proposed useful life), is crossed by the full line at an output value of 7 million.

COMPARISON OF THE 1911 AND 1912



1911 —  
 1912 —  
 100 —  
 200 —  
 300 —  
 400 —  
 500 —  
 600 —  
 700 —  
 800 —  
 900 —  
 1000 —


Hence, the lowest capacity or output, from the capital point of view, should not be less than 3.5. (3.2 to 4.6) million meters per year. So, any production capacity between 3.5 and 7 million will represent a profitable venture.

The same relationship exists between the gross profit and the investment capital in the integrated cotton cloth and rayon industry. As one feasibility study and report for the integrated cotton cloth factory and one for the rayon fabric cloth factory are available, the lowest capacity can be found in the same way as above. In Graph No. 3 the two points corresponding to those textile ventures lie on the lines, with an inclination, which corresponds to the grey cotton cloth weaving mill. At points where these lines cross the horizontal lines of the Internal Interest Rate of 0.136 and 0.228, the corresponding capacities or outputs are obtained. These results define the lowest profitable capacities for such textile ventures or projects.

<u>Type of textile production (cloth width 32")</u>	<u>Lowest capacities for starting a profitable industrial project (meters/yr)</u>
- grey cotton cloth	3,5 to 7,000,000
- dyed and printed cotton cloth	12,0 to 27,000,000
- rayon fabric cloth	1,5 to 3,000,000

The lower values of outputs ensure a capital recovery in 10 years at an interest rate of 6%. The higher ones ensure creation of a new depreciation value or the full amortization of real and movable properties in a useful life of 12 years (which is normal for the textile industry).

The Model Method calculations enables one person to get an idea of investment possibilities and opportunities not only in textile but also in other industries.



## BALUCH TEXTILE COMPANY (MAZAR-I-SHAHRIK)

Project: Integrated Cotton Cloth Manufacturing;  
annual output 10,900,000 meters of dyed  
and printed cotton cloth.

Upon the completion of a feasibility study and the review of contract terms and conditions of all investment calculations and the corresponding movement of capital for the first 20 years of operation of the project are represented graphically (Graph No. 4, Annex No.2).

- The invested capital will be recovered within 10 to 11 years of operation;
- In a 12 year span of useful life a new capital value of about 10% of the depreciation value will be created;
- The full depreciation value will be created in 37 to 40 years of operation.

All calculations are made at an interest rate of 6%, according to the contract terms.

Considering the above-mentioned results, it can be said that, from the capital point of view, this investment will ensure the recovery of invested capital on time, at the proposed interest rate of 6%. This means that the loan and the company capital will be returned in time, i.e. the loan in 7 years and the company capital in the following 3 to 4 years. A new capital value, of about 10% of the depreciation value, will be created during the same time period.

From the point of view of financing and development this project will not be successful as far as the creation of a new fixed asset value during its useful life is concerned.

But under the Afghan circumstances and development efforts can be recommended to establish and erect such a project, because all liabilities can be settled by current production. However, no consideration was made of the benefits to be obtained through the infrastructural development of the area, where the factory will be established.



## PREST TEXTILE COMPANY

Project: Rayon Fabric Cloth Manufacturing  
Annual Output 1,750,000 meters of  
dyed rayon fabric cloth.

Based on the contract terms and investment conditions concerning rayon cloth manufacturing, Grupa No. 5 can be interpreted as follows:

- The Investment Capital will be recovered in 6 years of operation. During the useful life of 12 years a new capital value of 31% of the depreciation value will be created.

The creation of a full depreciation value may be expected in 2 1/2 years. This investment venture almost fulfils earlier proposed stipulations for a profitable investment, taking into account larger production possibilities than those applied in these calculations. Therefore, this investment may be recommended. (Annex No. 3).

## COTTON AND RAYON YARN MANUFACTURING

Project: Underwear Factory Chaman Hozuri, Kabul  
Owner: M. KARIM

Mr. Karim, a private investor, intended to establish a yarn spinning and manufacturing factory in Kabul and asked for a profitability analysis.

A few bids were collected for this project from which some basic information is given below:

Supplier	Capacity in kgs of yarn per 8-hour shift	US\$ per Capac. Unit ("Free Exchange")	"Clearing" BARTER Agreements
1. METALEXPORT-Poland	752		334 \$
2. METALEXPORT-Poland	1,370		292
3. PLATT BRÜLL-J.K.	1,399	468	-
4. UNI MATIX-W.G rmany	1,690	455	-
5. KOVO-Czechoslovakia	2,760		290

On the basis of the above results, METALEXPORT is recommended as the most convenient and complete potential supplier.

All necessary basic drawings and proposals were elaborated to enable the Model Method calculations to be processed.

This analysis covers 1, 2 and 3 shifts of machine time.

Hours per day: 300 days per year	Output in kgs of yarn No. 34		
	8 hrs	16 hrs	24 hrs
<u>Annual output</u>			
Cotton yarn "Nm 34"	225,000	450,000	675,000
Rayon yarn "Nm 34"	180,000	360,000	540,000

INVESTMENT CALCULATIONS	<u>All in Afs.</u>	(Sum)
<u>Land, 10 Jiribs at 20,000 Afs/Jirib</u>	<u>200,000</u>	+
<u>Buildings, complete with lighting heating, sewerage, etc.</u> 2,200 sq.m. at 7,500 Afs per sq.meter	<u>16,500,000</u>	+
<u>Machinery, C.I.F. Afghan border</u>		
\$ 385,017 x 51.5 Afs	<u>19,800,000</u>	+
Loan 80%	<u>15,800,000</u>	
Interest on loan	<u>3,160,000</u>	+
Total repayment	<u>18,960,000</u>	
<u>Transportation - C.I.F. site "landed"</u>	<u>500,000</u>	+
<u>Assembly and erection</u>	<u>2,500,000</u>	+
<u>Fixed Investment:</u>	<u>50,000,000</u>	: Total
of which are:		
Contingencies	<u>7,340,000</u>	+
Total land, buildings, machinery, etc.	<u>42,660,000</u>	
Net (cash) investment excl. loan	<u>46,840,000</u>	
<u>Property</u>		
Real Estate	<u>16,700,000</u>	
Movable property	<u>33,300,000</u>	<u>50,000,000</u>
Net (cash) paid	<u>30,140,000</u>	

<u>Annual net sales</u>	<u>Afs per kg</u>	<u>8 hrs</u>	<u>16 hrs</u>	<u>24 hrs</u>
Cotton yarn	42	9,500,000	19,000,000	28,500,000
Rayon yarn	120	21,600,000	43,200,000	64,800,000

Operation Costs

Direct material, 95% yield

Cotton in kgs	237,000	474,000	711,000
Rayon in kgs	190,000	380,000	570,000
Cotton: 25 Afs per kg	5,920,000	11,840,000	17,760,000
Rayon: 44 Afs per kg	8,360,000	16,720,000	25,080,000

**Other costs**

(reels) of cotton	290,000	592,000	888,000
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**Basic materials**

Cotton	6,216,000	12,432,000	18,648,000
Rayon	8,656,000	17,312,000	25,968,000

**Supplies**

Spare parts:	0.3%	1.6%	2.4%
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**Maintenance material:**

Machinery:	0.3%	0.6%	0.8%
Buildings:	0.3%	0.3%	0.3%
Tools :	.1%	0.1%	0.3%
Lubricants:	0.1%	0.2%	0.3%

Total Supplies in Afs:	483,000	916,000	1,315,000
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**Power kwh per year**

	<u>8 hrs</u>	<u>16 hrs</u>	<u>24 hrs</u>
Production	540,000	1,080,000	1,620,000
Lighting	33,000	165,000	396,000
Total Kwh per year	573,000	1,245,000	2,016,000
In Afs.	573,000	1,245,000	2,016,000

Fuel oil (in kg)	60,000	106,000	144,000
(in Afs.)	300,000	530,000	720,000
Water, Air (in Afs.)	27,000	45,000	64,000

<u>Manpower - No. employed</u>	<u>72</u>	<u>124</u>	<u>176</u>
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<u>Direct labour</u>	<u>54</u>	<u>102</u>	<u>150</u>
Skilled	38	12	16
Semi-skilled	35	71	107
Unskilled	11	19	27

<u>Indirect Labour</u>	<u>18</u>	<u>22</u>	<u>26</u>
Management	2	2	2
Supervision	-	1	2
Office	8	9	10
Other	8	10	12

<u>Labour costs in Afs.</u>	<u>1,355,000</u>	<u>2,088,000</u>	<u>2,823,000</u>
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<u>Sales Costs</u>	237,000	474,000	712,000
Sales costs	(0.5%)		
Advertising )	(1.5%)		
Travel )			
Freight in/out )			
Banking affairs )	(0.5%)	Total: 2.5% of net sales	
Office Supplies )			
Contingencies )			

Recapitulation of Costs

Supplies	483,000	916,000	1,315,000
Power	900,000	1,512,000	2,800,000
Manpower	1,355,000	2,088,000	2,823,000
Other Costs	237,000	474,000	712,000
Total	2,975,000	5,298,000	7,650,000

Cotton production only

Direct materials	6,116,000	12,432,000	18,648,000
Total costs	<u>9,191,000</u>	<u>17,730,000</u>	<u>26,298,000</u>

Rayon production only

Direct materials	8,556,000	17,312,000	25,968,000
Total costs	<u>11,631,000</u>	<u>22,610,000</u>	<u>33,618,000</u>

Gross Profit

Cotton production	309,000	1,270,000	2,202,000
Rayon production	1,969,000	20,590,000	31,182,000

Company contribution

Cash payment (20% of machinery)	4,000,000	4,000,000	4,000,000
Civil engineering works	16,700,000	16,700,000	16,700,000
Assembly and erection	2,500,000	2,500,000	2,500,000
<b>Total:</b>	<b>23,200,000</b>	<b>23,200,000</b>	<b>23,200,000</b>

Working Capital (25% of net sales)

Cotton (in Afs)	2,375,000	4,750,000	7,125,000
Rayon (in Afs)	5,400,000	10,800,000	16,200,000

Company Capital

Cotton	25,575,000	27,950,000	30,325,000
Rayon	28,600,000	34,000,000	39,400,000

Interest of 6% on Company Capital during the 1.5 year construction period

Cotton	1,540,000	1,680,000	1,820,000
Rayon	1,720,000	2,040,000	2,360,000

Company Capital plus Interest

Cotton, Total	27,115,000	29,630,000	32,145,000
Rayon, Total	30,320,000	36,040,000	41,760,000

Annual Interest of 6% on Company Capital during useful life

Cotton	1,640,000	1,780,000	1,810,000
Rayon	1,820,000	2,170,000	2,520,000

Loan Repayment: Total 18,960,000

## Installments

1st year	1,896,000
2nd year	3,792,000
3rd year	3,792,000
4th year	3,792,000
5th year	3,792,000
6th year	1,896,000

Recovery of company capital in 10 yearsCompany capital excluding  
working capital

Cotton, 10 years	24,740,000	24,880,000	25,020,000
Rayon, 10 years	24,920,000	25,240,000	25,560,000
Cotton per year	2,474,000	2,488,000	2,502,000
Rayon per year	2,492,000	2,524,000	2,556,000

Capital Recovery including  
Interest on Company Capital

Cotton per year	4,114,000	4,268,000	4,312,000
Rayon per year	4,312,000	4,694,000	5,076,000

## TOTAL INVESTMENT

Fixed Investment	50,000,000	50,000,000	50,000,000
Working capital - cotton	2,375,000	4,750,000	7,125,000
Working capital - rayon	3,400,000	10,800,000	16,200,000

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Total Investment - cotton	52,375,000	54,750,000	57,125,000
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Total Investment - rayon	55,400,000	60,800,000	66,200,000
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Total Investment Costs

Net cash investment	46,840,000	46,840,000	46,840,000
Working capital: Cotton	2,375,000	4,750,000	7,125,000
Working capital: Rayon	3,400,000	10,800,000	16,200,000
Cash Investment: Cotton	49,215,000	51,590,000	53,965,000
Cash Investment: Rayon	52,240,000	57,640,000	63,040,000

Internal Interest Rate

Cotton	$\frac{\text{(Gross Profit)}}{\text{(Total Investment)}}$	0.0053	0.0247	0.0410
Rayon	$\frac{\text{(Gross Profit)}}{\text{(Total Investment)}}$	0.190	0.358	0.494

## TOTAL RECOVERY OF INVESTMENT CAPITAL

	<u>years</u>		
	over 100	over 100	over 100
Cotton at 6% Interest Rate			
Rayon at 6% Interest rate	6.5	3.8	2.4

TOTAL YEARLY LIABILITIES<sup>+</sup>

<u>Cotton:</u> 1st year	6,010,000	6,164,000	6,208,000
2nd through 5th year	7,906,000	8,060,000	8,104,000
6th year	6,010,000	6,164,000	6,208,000
7th through 10th year	4,119,000	4,268,000	4,312,000
<u>Rayon:</u> 1st year	6,208,000	6,590,000	6,972,000
2nd through 5th year	8,104,000	8,486,000	8,868,000
6th year	6,208,000	6,590,000	6,972,000
7th through 10th year	4,312,000	4,694,000	5,076,000

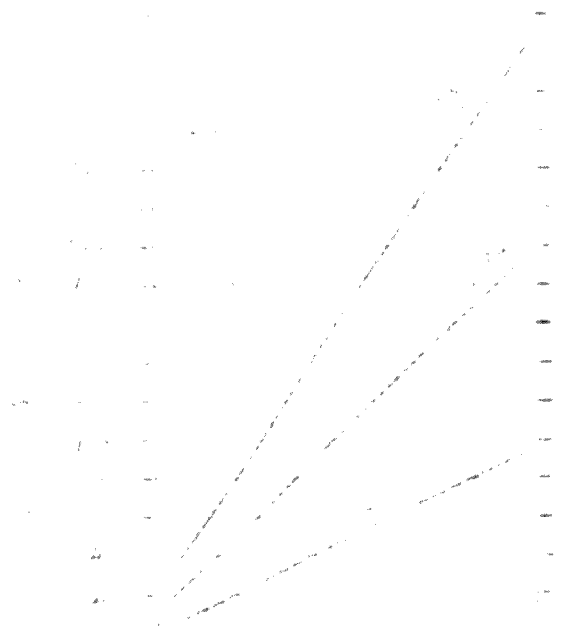
+ Liabilities: Loan repayment; interest on company capital; capital recovery.

Net Profit (Loss) yearly

<u>Cotton:</u> 1st year	(5,701,000)	(4,894,000)	(4,006,000)
2nd through 5th year	(7,597,000)	(6,790,000)	(5,902,000)
6th year	(5,701,000)	(4,894,000)	(4,006,000)
7th through 10th year	(3,805,000)	(2,998,000)	(2,110,000)
<u>Rayon:</u> 1st year	3,761,000	14,000,000	24,210,000
2nd through 5th	1,865,000	12,109,000	22,319,000
6th year	3,761,000	19,000,000	24,210,000
7th through 10th year	5,657,000	15,896,000	26,106,000

As seen from this analysis, a production of pure cotton yarn is not profitable at all.





Temperature vs. Time

Temperature vs. Time

The graph shows three different rates of temperature increase over time. The solid line represents the highest rate, the dashed line represents a medium rate, and the dotted line represents the lowest rate.

At time 10, the temperatures are 100, 75, and 50 respectively.

Time	Temperature (Solid)	Temperature (Dashed)	Temperature (Dotted)
0	0	0	0
10	100	75	50



Temperature vs. Time

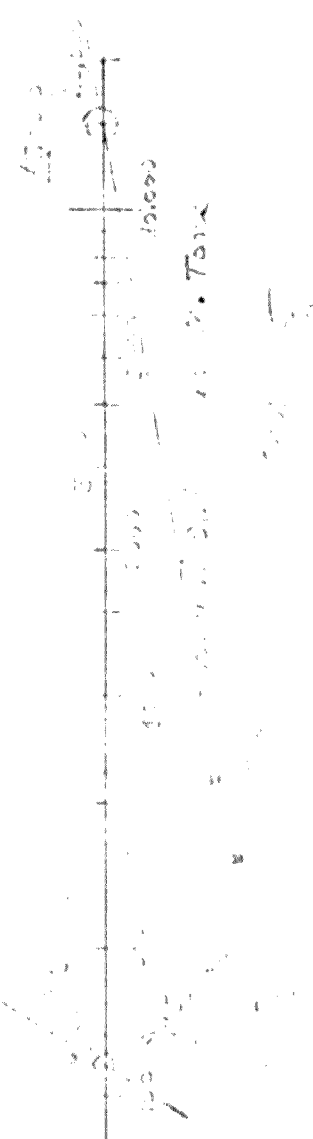
Temperature vs. Time

The graph shows a single rate of temperature increase over time, reaching 100 at time 10.

At time 10, the temperature is 100.

Temperature vs. Time

1. 1000  
 2. 1000  
 3. 1000  
 4. 1000  
 5. 1000  
 6. 1000  
 7. 1000  
 8. 1000  
 9. 1000  
 10. 1000



1. 1000  
 2. 1000  
 3. 1000  
 4. 1000  
 5. 1000  
 6. 1000  
 7. 1000  
 8. 1000  
 9. 1000  
 10. 1000

At "zero" profitability, i.e. at the breakeven point, a "mixed" production of 38% of cotton and 62% of rayon yarn in one shift is possible. When two shifts are working, the production should consist of 60% of cotton and 40% of rayon yarn, and for three shifts this ratio can be 77% of cotton and 23% of rayon yarn. (See Graph No.6). Such a development is expected in the initial three years of operation. In Graph No. 7 some figures for capital return in ten years are shown. This "profitable" production is possible with a mixed cotton/rayon yarn production only.

The lowest capacities for a cotton and rayon spinning mill still profitable under the existing market conditions are represented in Graph No. 8. According to these results, to start a yarn spinning venture can be recommended for the following capacities: for rayon yarn 175 tons and for cotton yarn at least 15,000 tons per year.

For instance, for a 16 hour working day, a mixed production at the breakeven point would be: 270 tons of cotton yarn and 145 tons of rayon yarn per year.

## SOME INVESTMENT INFORMATION AND DATA

The above performed calculations show a few correlations between the invested capital and corresponding plant capacities. These correlations are discussed in detail below.

A. BALKH TEXTILES COMPANY - An Integrated Cotton Cloth Factory

Yearly output of finished (dyed and printed) cotton cloth	10,900,000 meters
<u>Net fixed investment in:</u>	
Real property and services	59,350,000 AfS
Movable property "CIF-landed" at site all engineering, services included:	344,650,000 AfS
Contingencies	40,000,000 AfS
Working capital and interest during the erection	49,722,000 AfS
TOTAL	<u>483,722,000 AfS</u>

This corresponds to a sum of about US\$ 6,450,000

Investment per unit (meter per year)

\$ 6,450,000 : 10,900,000 meter per year	<u>US\$ 0.592</u> per meter and year
Buildings costs allocated to products	US\$ 0.072 per meter and year
Machinery costs allocated to products	US\$ 0.414 "
Other costs allocated to products	US\$ 0.106 "
for an initial production of 10 to 12,000,000 meters per year	

B. PREET TEXTILE COMPANY - An Integrated Rayon Weaving and Finishing Cloth Factory

Annual output of finished and dyed rayon cloth

2,500,000 meters

Net fixed investment in:

Real estate and services US\$ 242,000

Movable Property "CIF landed" at site all engineering services included 1,410,000

Local labour and contingencies 52,000

Working capital and interest during the erection 206,000

TOTAL

US\$ 1,970,000

Investment per unit (meters per year)

\$1,970,000 : 2,500,000 meters US\$ 0.789 per meter and year

Buildings costs allocated to products US\$ 0.103 "

Machinery costs allocated to products US\$ 0.560 "

Other costs allocated to products US\$ 0.126 "

for initial capacity of 2,5 to 3,000,000 meters per year.

## RELATION BETWEEN INVESTMENT AND CAPACITY

The correlation between the invested capital and capacities is:

$$C = C_0 \left( \frac{P}{P_0} \right)^n$$

where,

- C = new investment capital
- C<sub>0</sub> = existing or known investment capital
- P = new performance or output
- P<sub>0</sub> = existing or known performance or output
- "n" = a correlation power

Examined offers and contracts on various textile ventures, under the existing Afghan market conditions show that a correlation power "n" is in the range between 0.50 and 0.60 which is within the usual "n" power values of the textile industry throughout the world.

Knowing the above mentioned correlation, it is possible to determine investment capitals for desired new textile ventures on the basis of an existing investment or binding offer.

## CONSIDERATIONS OF INVESTMENTS IN TEXTILE INDUSTRY IN AFGHANISTAN

The results obtained through the Model Method investment calculations show that under the Afghan market and development circumstances the following lowest initial capacities in textile industry can be recommended:

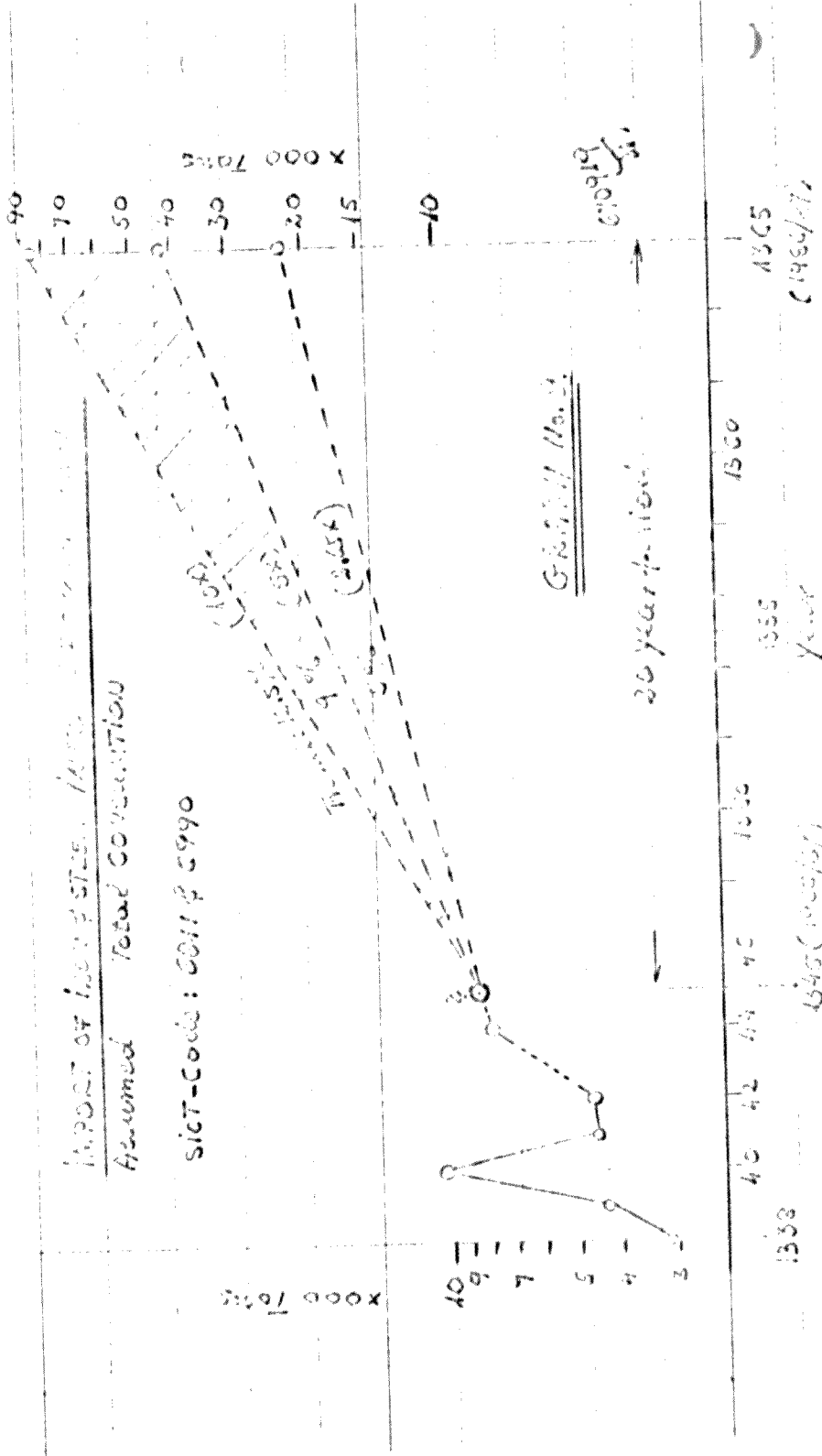
- Integrated cotton cloth      12 to 27 million meters
- Grey cotton cloth            3.5 to 7 million meters
- Rayon fabric cloth            1.5 to 3 million meters
- Yarn      rayon                    175 tons
- cotton                    15,000 tons

These capacities would enable the country to narrow the gap between consumption and production of cotton cloth and to ensure the development of certain regions of the country.

REPORT OF INVESTMENT IN THE 30 YEAR PERIOD

Assumed Total Contribution

SICR-Code: 6011 & 5990



Source: Statistics of the Ministry of Commerce  
 Ministry of Nationalistic Development

## STEEL INDUSTRY

(Re) Rolling of Reinforcing Bars

To get an idea of investment possibilities and opportunities in iron and steel industry in Afghanistan, a research and marketing study was conducted.

The consumption of iron and steel semiproducts is covered under the SICT-CODE No. 6811 and 6990. This is the reason for the existence of some officially published data and records on the import of iron and steel. All the available data were augmented by one-third in order to include the other sources of iron and steel supply which are not covered by official statistics. In Graph No. 9 this import "consumption" figures into Afghanistan from 1338 (1959/60) to 1344 (1965/66) were also indicated.

Source: "Import of Merchandise into Afghanistan", issued by Statistical Department of Ministry of Commerce. On the basis of the above mentioned records a consumption figure during the recent years can be reconstituted:

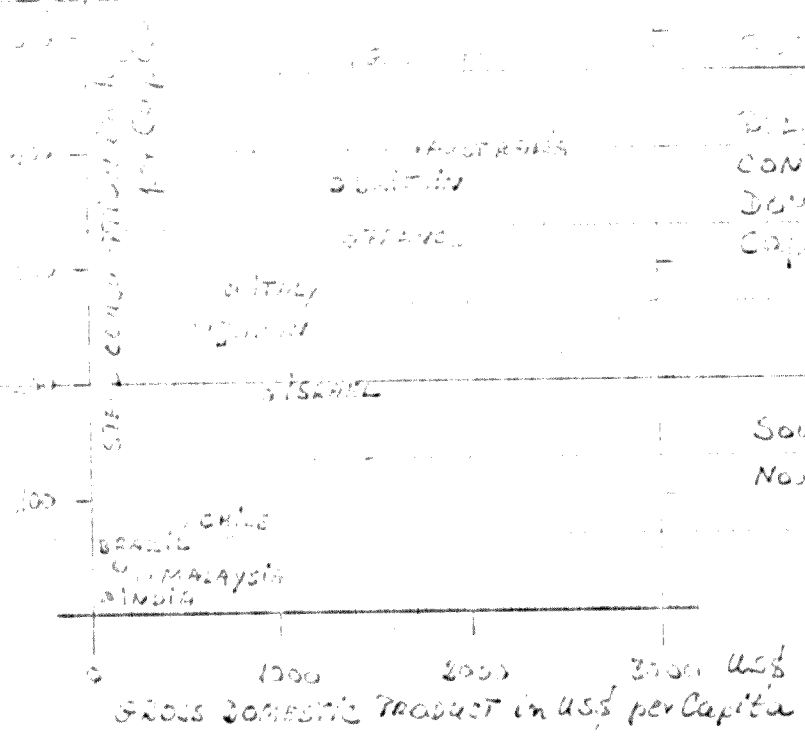
<u>Year</u>	<u>Import Records augmented by 1/3</u> (in tons)	
1338 (1959/60)	3,110	All these figures are below the consumption level of 1 kg per capita per year.
1339 (1960/61)	4,270	
1340 (1961/62)	10,190	
1341 (1962/63)	4,500	
1342 (1963/64)	4,530	
1344 (1965/66)	7,960	

In order to compare these figures on steel consumption with those from other Asian countries, the following table is presented (based upon Japanese forecasts on consumption of steel per capita).

Country	Year		Ratio	1980 1960
	1960	1980		
Burma	4.4	12.6		2.86
Indonesia	4.0	14.0		3.50
Pakistan	5.8	22.8		4.15
The Philippines	12.9	58.5		4.53
Thailand	10.3	24.2		2.35

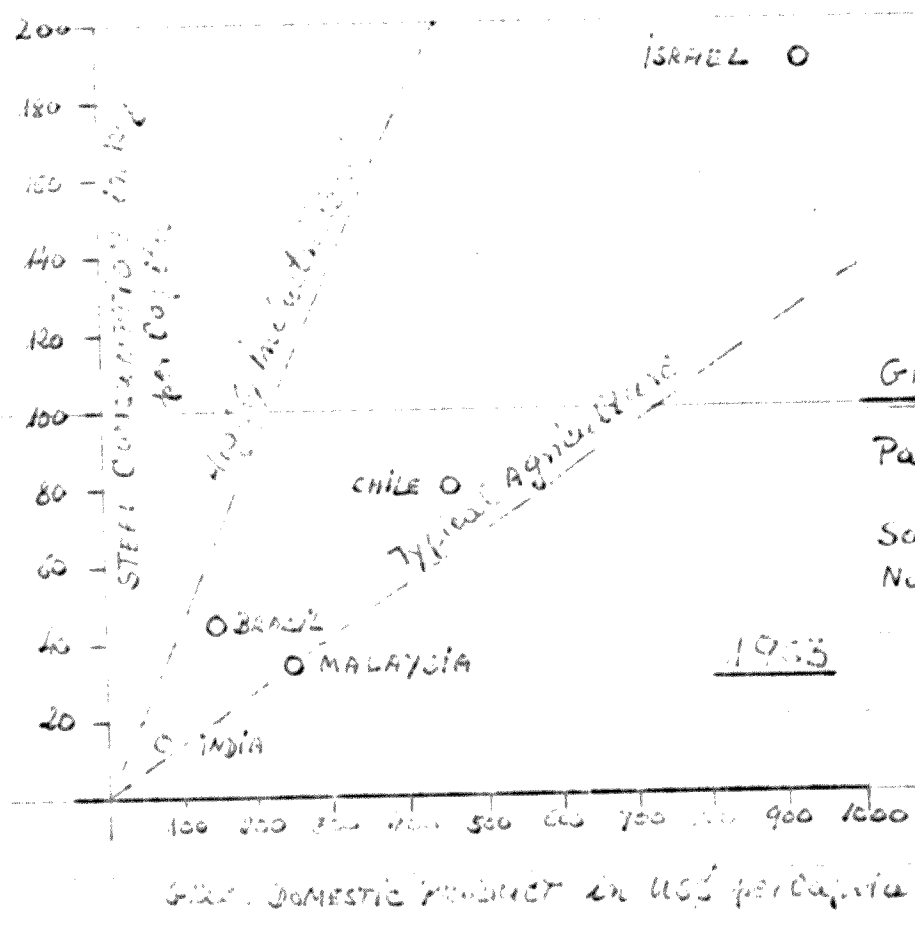
Source: Stahl und Eisen, 1 - 1965 - p. 13





RELATION BETWEEN STEEL CONSUMPTION AND GROSS DOMESTIC PRODUCT per Capita in 1963.

Source: THE ECONOMIST  
November 6, 1963, p. 622/23



GRAPH No. 11.

Part of the GRAPH No. 2.

Source: THE ECONOMIST  
November 6, 1963, p. 622/23

1953

As seen, the increase in steel consumption in the next twenty years will not surpass 5 times the consumption of 1960 in the above mentioned countries.

It would be interesting to present here a relation between the consumption of steel and the gross domestic product in some countries, both developing and highly developed ones. This relation is shown on Graph No. 10 and No. 11 which indicate interdependence between the consumption of steel and the gross domestic product.

In Graphs Nos. 10 and 11 two extreme cases of a highly industrialized and a typically agricultural country are presented where a proportion is still easy to recognize.

(Source: The Economist, November 6, 1965, p. 622/23)

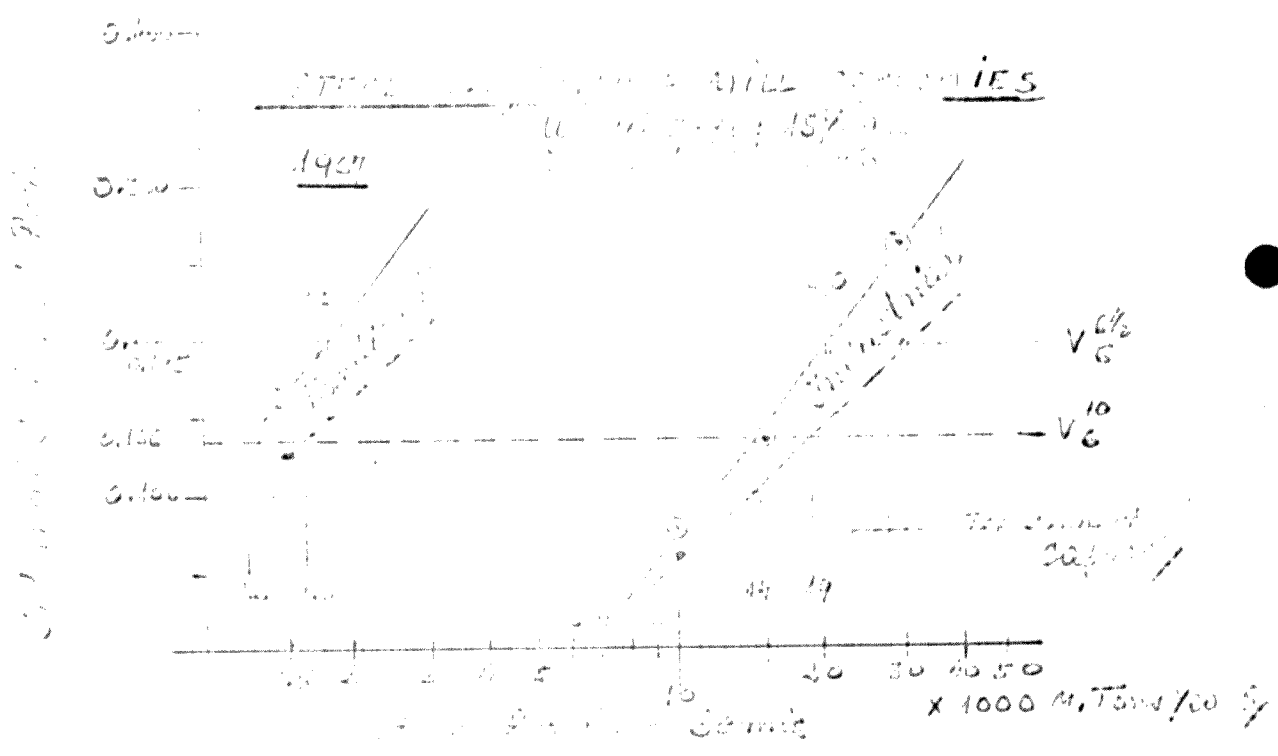
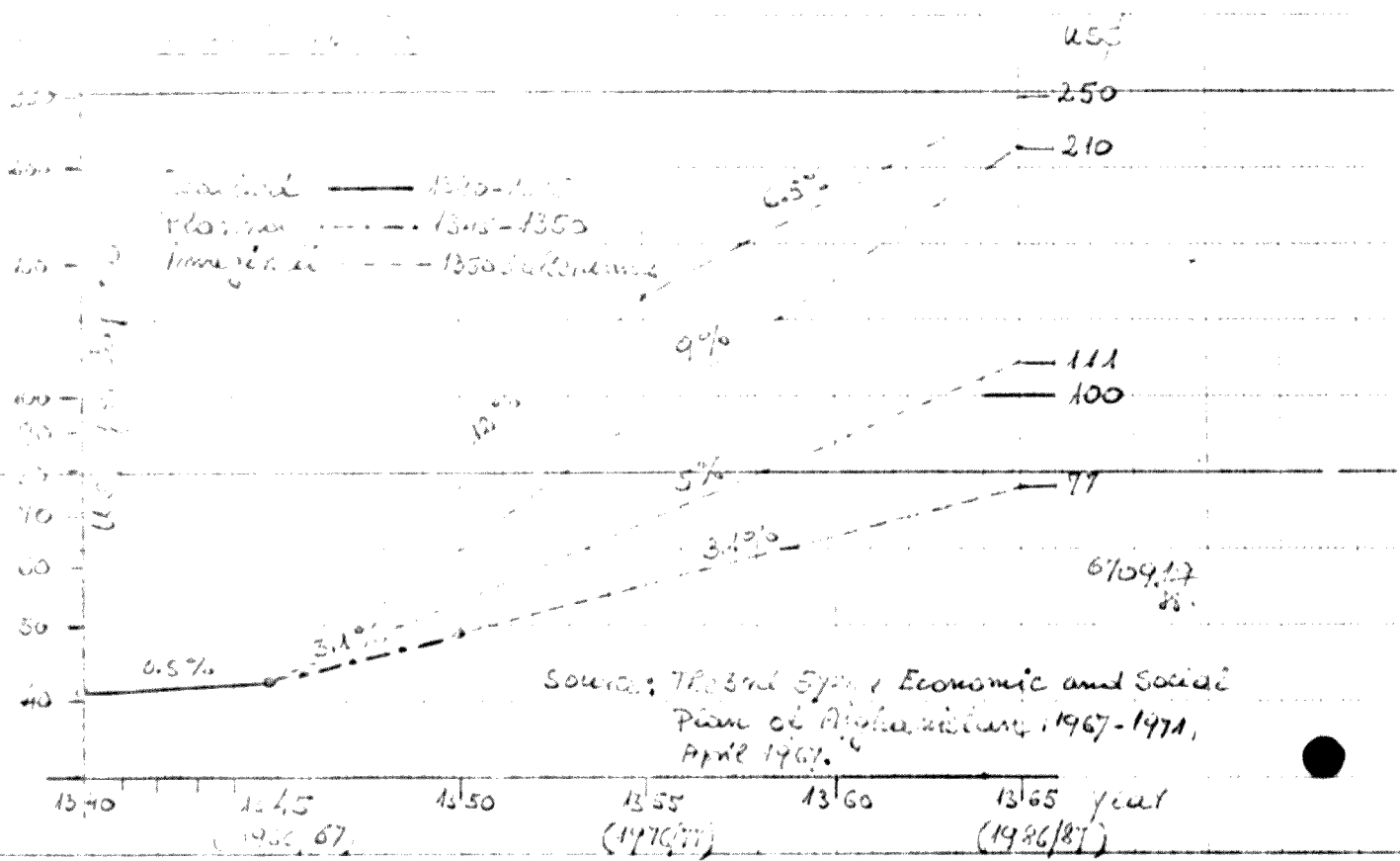
Taking into account the above mentioned, it is interesting to see the trend the Afghan gross domestic product will take in the future.

According to the official records, published in an issue of the Third Five Year Economic and Social Plan of Afghanistan (1967/1971; April 1967); the gross domestic product in the second Five Year Plan of Afghanistan was rising at a rate of 0.2% a year. The projected trend of the gross domestic product in the Third Plan is 3.5 % a year. These figures are indicated in Graph No. 12.

Considering the many factors which are beyond the control of the country and its economy, exact forecasts are difficult to make. The forecasts of steel consumption were made on the basis of the following assumptions.

1. Steel consumption in Afghanistan will not surpass the present value by much more than 5 times within the next 20 years;
2. The increase in the gross domestic product will be between 2 and 5 times larger than the present one in the same period.

Therefore, it can be expected that after 20 years steel consumption will exceed 40,000 tons and will be less than 90,000 tons a year. These figures are very rough, but the proportions are convincing, as shown in Graph No. 9.



GRAPH No. 13

There were already a few attempts to establish a (re) rolling mill in Kabul, and it is therefore interesting to investigate such an investment.

The present consumption level of iron and steel is about 10,000 tons per year. The ratio of light beams and other profiles in the total steel consumption is 1/5 to 1/4 only, i.e. 2 to 3,000 tons per year.

Therefore, the projects for new rolling mills should not surpass these figures for more than 5 to 10 times within the coming 20 years.

By applying the Model Method and other investment calculations the lowest profitable capacities which could be established in Afghanistan are obtained. In the Graph No. 13 and in Annex No. 4 some results and data are available.

Two Models of rerolling mills are compared, one for a modern mill (in the industrial sense), and the other for a "handicraft" type re-rolling shop.

Following these interpretations and results, the lowest capacities or outputs were predicted:

	<u>Lowest Capacity</u>
- For the "industrial" mill	15 to 20,000 tons per year
- For the "handicraft shop"	1,5 to 1,800 tons per year

But an establishment of a "handicraft" type (re)rolling shop could be of a temporary interest only. Such a low capacity steel venture can be established also by a private investor.

## PREPARING OF CONTRACTS

## A. OIL FACTORY, BALKH

This factory will be established during the Third Five Year Plan. After collecting all the necessary technical and commercial data and offers, the Department decided that the factory should have a daily capacity of at least 10 tons of refined edible oil. Two foreign firms, one from the U.K. and the other French competed for the contract.

Machinery, equipment and engineering services offered by both firms were practically the same from the technical point of view, but the French one offered better commercial terms (10% price difference) and more guarantees to ensure a complete production performance. It agreed to accept all the terms from the General conditions for the supply and erection of the plant and machinery for import and export (No. 183 A) prepared under the auspices of the United Nations Economic Commission for Europe, Geneva, March 1957. As it accepted full responsibility, the French firm was chosen over the UK firm. The contract and all other formalities were completed by the Expert and the counterparts to conclude this business. The copy of the contract is available at the Department.

The contract value of this project is about US\$ 800,000.

## B. PAPER TEXTILE COMPANY

This project relates to the establishment of a rayon fabric cloth manufacturing in Kabul. After a three-year negotiation period it was about to be concluded. Some economic and technical analyses of the project as well as a comparison of the three offers were elaborated in this text.

As a result of the competition, one French and one Japanese firm were selected. The offers were different in prices, commercial terms and guaranteed capacities. To teach and train national counterparts in dealing with such problems a detailed analysis was prepared.

The Japanese offered twice the same machinery, but with two different production capacities, i.e. with a production capacity of 1,540,000 meters per year, and 1,710,000 meters per year. In this analysis the two Japanese offers are marked as Japan I and Japan II.

The French firm offered a yearly capacity of 2,500,000 meters, with practically the same volume of machinery and equipment.

Analysis of the three offers: Preet Textile Co.

Compared Items	Japan I	Japan II	France
Guaranteed yearly output in meters per year	1,540,000	1,710,000	2,500,000
Land, building, roads, services, civil engineering work	242,000	242,000	242,000
Machinery, engineering services, equipment, some buildings materials (about 600 tons, C.I.F., Karachi)	1,080,000	1,080,000	1,380,000
Loan, 90% of machinery cost	972,000	972,000	1,242,000
Interest on loan	243,000	243,000	374,000
Total repayment	1,215,000	1,215,000	1,616,000
Transportation (\$50 per ton Karachi-Kabul)	30,000	30,000	30,000
Local construction and contingencies	52,000	52,000	52,000
Total fixed investment	1,647,000	1,647,000	2,078,000
US\$: Invested per meter and year	1,070	0.965	0.830
<u>Company capital - PREET</u>			
Cash payment	108,000	108,000	138,000
Civil engineering work	242,000	242,000	242,000
Transportation	30,000	30,000	30,000
Local construction	52,000	52,000	52,000
Working capital as % of net sales	134,000	158,000	230,000
TOTAL	576,000	590,000	692,000

Compared Items	Japan I	Japan II	France
Interest on total during the 2 year erection period at 6%	30,000	36,000	36,000
TOTAL Company Capital	611,000	626,000	728,000
Of which:			
Company Capital for the 1st year	280,000	285,000	246,000
Cash payment	(10%) 108,000	(10%) 108,000	(5%) 69,000
50% of civil engineering work costs	121,000	121,000	121,000
50% of local erection costs	26,000	26,000	26,000
Transportation	30,000	30,000	30,000
Company capital for 2nd year	291,000	300,000	446,000
Cash Payment	-	-	(5%) 69,000
50% of civil engineering work costs	121,000	121,000	121,000
50% of local erection costs	26,000	26,000	26,000
Working Capital	134,000	158,000	230,000
<u>Loan Repayment</u>	1,215,000	1,215,000	1,616,000
1st year	17,355	17,355	61,300
2nd year	173,572	173,572	244,300
3rd year	173,572	173,572	244,300
4th year	173,572	173,572	244,300
5th year	173,572	173,572	244,300
6th year	173,572	173,572	224,300
7th year	173,571	173,571	224,300
8th year	156,214	156,214	128,400



Compared Items	Japan I	Japan II	France
<u>Annual Operation Costs</u>			
First five years	310,000	312,000	475,000
Thereafter: No exemption	380,000	417,000	397,000
<u>Annual Net Sales</u>			
1st year of operation	266,000	296,000	360,000
2nd year of operation	353,000	392,000	603,000
3rd year of operation	337,000	392,000	363,000
<u>Gross Profit</u>			
1st year	44,000	36,000	105,000
2nd year	223,000	260,000	330,000
3rd year	223,000	260,000	390,000
4th year	223,000	260,000	390,000
5th year	223,000	260,000	390,000
6th year	153,000	175,000	268,000
Thereafter	153,000	175,000	268,000
Annual interest on company capital at 6%	34,500	37,260	43,700
<u>Capital movement during the first 12 years of operation</u>	See Table I		
<u>Capital movement during the first 12 years of operation</u>	See Table I		
Balance: 0 to 5th year	-46,143	104,225	347,500
Balance: 0 to 8th year	-200,000	13,220	443,400
Balance: 0 to 12th year	216,000	363,380	1,340,600

Compared Items	Japan I	Japan II	France	
<u>Recovery of company capital</u>				
Company capital total	611,000	626,000	728,000	
Company capital less working capital	477,000	468,000	498,000	
Years for recovery	about 14	11 to 12	8 to 9	
New capital created at the end of the 12th year	-211,000	95,230	842,600	
Part of depreciation on total fixed investment	-	5.8%	40.5%	
TOTAL GROSS INVESTMENT	1,816,000	1,841,000	2,344,000	
Fixed investment	1,647,000	1,647,000	2,078,000	
Working capital	134,000	158,000	230,000	
Interest during erection	35,000	36,000	36,000	
Gross invested capital per meter and year	1,180	1,080	0,935	
<u>Some comparisons</u>		I	II	
Company capital less working capital		+21,000	+30,000	
Company capital including working capital (no interest included)		+117,000	+102,000	
Total Gross Investment		+528,000	+503,000	
<p>"," means in excess of the Japanese offer. Some figures have been rounded off.</p>				
Capacity in %	100	100	162	146
Total gross investment in %	100	100	128.5	129.5
Total fixed investment in %	100	100	126	128.5
Average internal interest rate	0.097	0.113	0.139	

**TABLE I**

CAPITAL MOVEMENT DURING THE PIPE  
OPERATION (Useful life of the pipe  
all in US\$)

Year	Japan I: 1,540,000 meters per year				Japan II: 1,710,000 meters			
	Gross profit	Installments	Interest on Company Capital	Balance	Specific Value	Gross profit	Installments	Interest on Company Capital
1	-44,000	17,355	36,500	-97,855		-36,000	17,355	37,500
2	223,000	173,572	36,500	12,928		260,000	173,572	37,500
3	223,000	173,572	36,500	12,928		260,000	173,572	37,500
4	223,000	173,572	36,500	12,928		260,000	173,572	37,500
5	223,000	173,572	36,500	12,928	43,143	260,000	173,572	37,500
6	153,000	173,572	36,500	-57,072		175,000	173,572	37,500
7	153,000	173,571	36,500	-57,071		175,000	173,571	37,500
8	153,000	156,214	36,500	-39,714	200,000	175,000	156,214	37,500
9	153,000	-	36,500	116,500		175,000	-	37,500
10	153,000	-	36,500	116,500		175,000	-	37,500
11	153,000	-	36,500	116,500		175,000	-	37,500
12	153,000	-	36,500	116,500	266,000	175,000	-	37,500
<b>Total</b>	<b>1,919,000</b>	<b>1,215,000</b>	<b>438,000</b>	<b>266,000</b>		<b>2,229,000</b>	<b>1,215,000</b>	<b>450,000</b>

PROFIT DURING THE FIRST 12 YEARS OF  
(Useful life of the factory 12 years  
all in US\$)

France: 1,710,000 meters per year

France: 2,500,000 meters per year

Year	Install- ment	Interest on Compa- ny Capital	Balance	Specif. Value	Gross profit	Install- ments	Interest on Comp. Capital	Balance	Spec. Value
1950	17,355	37,560	-90,915		105,000	61,300	43,700	0,00	
1951	173,572	37,560	48,869		330,000	244,300	43,700	42,000	
1952	173,572	37,560	48,869		390,000	244,400	43,700	101,900	
1953	173,572	37,560	48,869		390,000	244,500	43,700	101,800	
1954	173,572	37,560	48,869	104,555	390,000	244,500	43,700	101,800	347,500
1955	173,572	37,560	-36,131		268,000	224,300	43,700	0,00	
1956	173,571	37,560	-36,131		268,000	224,300	43,700	0,00	
1957	136,214	37,560	-18,774	13,520	268,000	128,400	43,700	95,900	443,400
1958	-	37,560	137,440		268,000	-	43,700	224,300	
1959	-	37,560	137,440		268,000	-	43,700	224,300	
1960	-	37,560	137,440		268,000	-	43,700	224,300	
1961	-	37,560	137,440	563,280	268,000	-	43,700	224,300	1,340,600
1962	1,215,000	450,720	563,280		3,481,000	1,616,000	524,000	1,340,600	

SECTION 2

Notes:

- Working capital is assumed as 3/12 of the net annual sales
- Annual operation costs are calculated during the first 5 years of operation with import duties exemption; afterwards without these benefits according to the new Afghan Foreign and Domestic Private Investment Law - January 1967, before the Amendment.
- Gross profit is defined as a difference between the net annual sales and operation costs, even in the first and second years of operation because of the run-in of production and training of personnel, neglecting the lower production.
- An average gross profit is the sum of the annual gross profits for the first 12 years of operation divided by 12.
- In all calculations a 12 year useful life of the factory was assumed.
- The depreciation of 8.3% of the total value of fixed assets.

The results of the analysis give the priority to the French offer, even though the offers are different in capacities, commercial and loan conditions and in other terms.

All records and details of the offers are available at the Department.

C. BALKH TEXTILES COMPANY - (Mazar-i-Sharif)

For this venture totalling about 6.5 million US dollars, an economic and profitability analysis was prepared on the basis of the offers made by the contractors.

## OTHER WORK AND ACTIVITIES

A. Proposal for calculating depreciation

A proposal for calculating depreciation i.e. useful life of fixed assets in Afghan industrial and other enterprises was made.

The proposal covers 83 items including civil engineering work, transportation means; common machinery; devices and equipment for particular industries; inventories and large tools; instruments and laboratory equipment; agriculture plantations; livestock; and establishment deposits; licenses; patents; etc.

It is considered that the straight-line method is the simplest and best suited for the Afghan conditions. It is also based on the new depreciation regulations.

- B. The expert was attached to a team of engineers to evaluate a repair workshop in Herat. After completing the highway from Kandahar to Torghundi the Russian builders left a complete mechanical workshop for repair and overhaul of cars, trucks, tractors and earthmoving machines. The capacity of the workshop was roughly 5 to 10 vehicles a day.

Because some of Kabul's enterprises, as well as a few in Herat were interested in machines and equipment which were left, the Ministry of Mines and Industries formed a team of engineers for evaluation of the workshop.

The team saw about 400 different metal working and other machines and concluded that the present technical value of the workshop is about one third of the initial value.

The report of the team and the documentation on this matter is available at the Department.

C. BALGH TEXTILES COMPANY, MAZAR-I-SHARIF

The expert was also attached to another team of engineers, asked to scrutinize the energy supply situation for the new industrial ventures in Mazar-i-Sharif area.

This question arose in connexion with the establishment of the Balkh Textile Factory and the supply of energy from the "public" sources. The factory will be established at the end of 1969, although it was determined that the earliest period in which the electricity and natural gas will be available is 1970/71.

There will be a time gap of one to two years in the supply of energy. Such a situation involves some additional investment costs in supplying energy or a delay in the start-up of the factory.

D. Cotton and Cotton Semi-finished products Price Policy

In order to explain the basic factors influencing cotton and cotton semi-finished products prices and production (processing) costs, a visit to two cotton processing enterprises in the northern provinces was made. There, the ways of treating raw cotton and processing it into ginned cotton, edible oil or fat and soap were investigated. The companies' book keeping and accounting were also studied.

The enterprises visited were SPINZAR CO., Kunduz, and BAKHTAR SANAA TI SHERKAT, Mazar-i-Sharif.

Spinzar Co. is an "integrated" cotton firm, engaged also with cotton farming, ginning, oil-fat and soap production, as well as with ceramic and other businesses. It is one of the largest and strongest Afghan enterprises. It processes about 40,000 tons of raw cotton a year.

Bakhtar Sanaati Sherkat, is the second firm in cotton business in the northern provinces, processing between 7 and 10,000 tons of raw cotton annually.

Since cotton prices are under the Government control and these enterprises asked for new, higher or free prices, the Ministry of Mines and Industries asked for an analysis on this subject.

To find out the relations in the raw cotton processing, some calculations were performed to complete this task. The results are as follows:

1. The Distribution of ginned cotton and cotton-semi-finished products obtained from raw cotton:

<u>Raw Cotton</u>	<u>100% (quantity)</u>
(Ginned) Cotton	33%
Seeds delinted	60%
Lintar	1.3%
Waste	5.7%

<u>Cotton seeds delinted</u>	<u>100%</u>	<u>Referred to 100% raw cotton</u>
Hulls	50%	30%
Cakes	32%	19.2%
Refined oil or fat	10-15%	6-9%
Waste	3-8%	18-4.8%
(Soap stock)	1.4%	(0.8%)

These percentages are obtained from a two year analysis (1344 and 1345 Afghan year or 1965/66 and 1966/67) made by Spinzar Co. and Bakhtar San. These values deviate from the average values by less than  $\pm 3\%$ .

Prices and costs recorded in 1345 (1966/67)

Raw cotton, purchasing price	5.64 Afs per kg
Cotton, ginning cost related to raw cotton quantity	1.98 Afs per kg
Hulls, sales price	0.57 Afs per kg
Cakes, sales price	1.41 Afs per kg
Seeds, cost or price	2.25 Afs per kg



Refined oil processing cost

Spinzar Co.	3.73 Afs per kg
Bakhtar San	7.20 Afs per kg
Soap stock, both companies	4.96 Afs per kg
Fat (shortening) Spinzar Co. only	4.4 Afs per kg

Refined Oil Yield

Spinzar Co.	11%
Bakhtar San	12.5%

from processed delinted cotton seeds.

As an example, some calculations involving 10,000 tons of raw cotton processed per year were made in order to get the basic idea on the distribution of values and the processing of cotton.

These calculations are based on the prices and costs which existed in 1345 (1966/67).

	<u>Total value in Afs</u>
Raw cotton: 10,000 tons	56,400,000
Ginning cost: for 10,000 tons	19,800,000
Total	76,200,000

Value distribution between Cotton and Seeds

Seeds delinted: 6,000 tons 2,250 Afs per ton	13,500,000
Cotton (Ginned): 3,300,000 kgs (76,200,000 - 13,500,000)	62,700,000
Total	76,200,000
Cotton (Ginned) unit price 19,00 Afs per kg (62,700,000 : 3,300,000)	

<u>Value of semi-finished products</u>	<u>Total in Afs</u>
Hulls: 3,000 tons at 570 Afs	1,710,000
Cakes: 1,920 tons at 1,410 Afs	2,707,200
Soapstock: 85 tons at 4,960 Afs	421,600
Total (considered as by product revenue - "BONIFICATION")	4,838,800

Values of semi-finished products are not taken into account i.e. all calculations exclude "Bonification".

Cotton (Ginned)	19.0 Afs per kg
Seeds delinted	2.25 Afs per kg

• Refined oil

Spinzar Co.: /2.25 : 0.11 (yield)/ + + 3.73 (Proc.cost)	24.19 Afs per kg
Bahtar San: (2.25 : 0.125) + 7.20	25.20 Afs per kg
Fat-Spinzar Co.: (2.25 : 0.11) + + 3.73 + 4.54 (fat proc.cost)	28.73 Afs per kg

• Refined oil prices are calculated in the following manner - Unit prices of seeds are divided by oil yield and to this the oil processing unit cost is added. For fat, the calculations are the same with the processing cost of shortening added.

Calculation including Bonification, fully allocated to the value of cotton

Cotton (Ginned) (62,700,000) - (4,838,800) :	
3,300,000	17.53 Afs per kg
Seeds delinted	2.25 Afs per kg
Oil and fat, the same prices as above	

Calculation including Bonification, fully allocated to the value of cotton seeds

Cotton (Ginned)	19, 70 Afs per kg
Seeds (13,500,000 - 4,838,800) :	
: 6, 000, 000	1,44 Afs per kg
<u>Refined oil and fat</u>	
Spinzar Co.: (1.44 : 0.11) + 3.73	16.82 Afs per kg
Bakhtar San. (1.44 : 0.125) + 7.20	18.72 Afs per kg
Fat Spinzar Co. (1.44 : 0.11) + + 3.73 + 4.54	21.46 Afs per kg

These calculations permit the determination of relationships between values, quantities, costs and prices in cotton processing by Spinzar Co. and Bakhtar San., in 1345 and 1346.

The price situation and policies in 1346 (1967/68)

Spinzar Co. recently proposed new promotional prices to be observed in 1346.

Proposed Prices by Spinzar Co.

Raw cotton, purchase price	0.86 Afs per kg
Hulls, sales price	1.00 Afs per kg
Cakes, sales price	2.83 Afs per kg

Taking the above proposed prices into consideration, the processing costs in 1346 remain the same as 1344 and 1345 (1965/66 and 1966/67).

Applied to a basic quantity, the values are as follows:

	<u>Value in Afs</u>
Raw cotton; 10,000 tons	68,600,000
Hulls; 3,000 tons at 1,000 Afs/ton	3,000,000
Cakes; 1,920 tons at 2,830	5,433,600
(Soapstock; 85 tons at 4,960)	421,600
Total (hulls cakes, soap)	8,855,200

The new cost levels affected by the newly proposed prices are:

Raw cotton; 10,000 tons	68,600,000
Ginning costs at 1,980 per ton	19,800,000
Total excl. "Bonification"	88,400,000
Seeds delinted; 6,000 tons at 2,250 Afs	13,500,000
Cotton (Ginned); 3,300 tons (68,400,000 - 13,500,000)	74,900,000

Taking into account all new values, the corresponding unit prices of cotton and semi-finished products are:

New unit prices, excl. "Bonification"

Cotton (Ginned); 3,300,000 kgs (74,900,000 : 3,300,000)	22.70 Afs per kg
Seeds, old price	2.25 Afs per kg

Refined Oil

Spinzar Co.	24.19 Afs per kg
Bakhtar Can.	23.20 Afs per kg
Fat-Spinzar Co.	28.73 Afs per kg

New unit prices including "Bonification" allocated to cotton

Cotton (Ginned)	20.01 Afs per kg
Seeds delinted, old price	2.25 Afs per kg

Refined oil and fat prices are the same as before, based on the price of seeds.

New unit prices including "Bonification" allocated to seeds

Cotton (Ginned)	22.70 Afs per kg
Seeds	0.77 Afs per kg

Refined Oil

Spinzar Co.: (0.77 : 0.11) + 3.73	10.73 Afs per kg
Bakhtar Jan.: (0.77 : 0.125) + 7.20	13.36 Afs per kg
Fat-Spinzar Co. (0.77 : 0.11) + + 3.73 + 4.54	15.27 Afs per kg

New prices including "Bonification" allocated to seeds  
related to ginned cotton price from 1945

Cotton (Ginned)	19.00 Afs per kg
Seeds delinted (33,400,000 - 62,700,000): 6,000,000	2.31 Afs per kg

• Refined Oil

Spinzar Co.: (2.81 : 0.11) + 3.73	29.28 Afs per kg
Bakhtar Jan.: (2.81 : 0.125) + + 7.20	29.68 Afs per kg
Fat-Spinzar Co.: (2.81 : 0.11) + + 3.73 + 4.54	33.82 Afs per kg

• Government and other taxes and levies are not included  
in the above calculations.

## RECAPITULATION

"Ex works" unit prices in 1945 (1966/67)  
in Afs per kg

Item	Bonification		
	Excluded	Allocated to cotton	Allocated to cotton
Cotton, ginned	19.00	17.53	19.00
Seeds delinted	2.25	2.25	1.44
<u>Refined Oil</u>	-	-	-
Spinzar Co.	24.19	24.19	16.82
Bakhtar San.	25.20	25.20	18.72
Fat-Spinzar Co.	28.73	28.73	21.46

"Ex works" unit prices in 1946  
(1967/68) in Afs per kg

Item	Excluded	Bonification			In 1945
		Allocated to Cotton	Seeds	Cotton 50% Seeds 50%	
Cotton, ginned	22.70	20.01	22.70	21.35	19.00
Seed delinted	2.25	2.25	0.77	1.51	2.81
Refined oil	-	-	-	-	-
Spinzar Co.	24.19	24.19	10.73	17.46	29.28
Bakhtar San.	25.20	25.20	13.36	19.28	29.68
Fat-Spinzar Co.	28.73	28.73	15.27	22.00	33.82

Some indications are that ginned cotton sales prices should be retained in 1946 (1967/68) on the same level as they were in 1945 (1966/67). In this case the costs of refined oil and other semi-finished products will rise.

To keep the "ex works" prices of oil and fat on the 1945 level, it is necessary to raise the sale prices of hulls and cakes, to 1.43 Afs per kg of hulls and 4.05 Afs per kg of cakes. Such high prices of semi-finished products will probably make their sale more difficult under the existing market circumstances.

## CONCLUSIONS

This report has established a "Model Method" which can be easily applied and used in quick, reference calculations of investment possibilities.

It is of particular interest of the developing countries where basic assumptions for calculating return on investment and defining depreciation schedules frequently differed from those in the industrially developed countries.

Throughout this report the "Model Method" was applied to a number of investment ventures, private or government sponsored. The results obtained by applying the "Model Method" answer clearly the basic questions of profitability of a venture, without going into detailed theoretical calculations involving capital movement, interest and depreciation schedules.

The method described is particularly suited for smaller enterprises and use by managers without extensive theoretical training.

It is recommended that in the future experts on missions similar to this one, report directly to the organs responsible for planning and approval of industrial ventures and granting of licences, in close co-operation with the financial institutions which grant loans for different undertakings.



Annex No. 1

## GREY COTTON CLOTH MANUFACTURING

## THE MODEL METHOD

Basic Data

A. Final Product Cloth: Grey cotton cloth; finished width 81 cm; 32"

- |               |             |                 |
|---------------|-------------|-----------------|
| - Dimensions: | Width       | Length          |
| per piece     | 81 cm (32") | 30 m (33 yards) |
- Made of prepared cotton yarn
  - weft 40; warp 40;
  - Density - Grey
  - Filling: 20 picks per cm; 50 picks per inch
  - warp : 20 picks per cm; 50 picks per inch
  - Weight : per piece: 3.44 kgs; per 1 m = 0.118 kgs
  - Selling price: (9.0 Afs m)

B. Raw Materials and Supplies Prices

- Yarn Price: 45.0 Afs p kg
- Fuel oil : , Afs per kg
- Electric power: 1 Af per Kwh.

C. Registration tax: 0.1% of registered Capital

D. Labour and Wages

Manager	60,000 Afs per year
Supervisor	36,000 Afs per year
Office	18,000 Afs per year
Other	6,000 Afs per year
Skilled	18,000 Afs per year
Semi-skilled	12,000 Afs per year
Unskilled	6,000 Afs per year

**E. Costs and Prices of civil engineering works,  
land, roads, etc.**

**Land**

One Jirib - about 1,000 sq.m.	15,000 Afs per
Completely installed buildings: 5,000	7,500 Afs per sq.m.
Fences - 2 m high:	500 Afs per m.
Paved road, 5 m. wide:	1,500 Afs per m.
Concrete: 1,500 Afs per Cu.m.;	
reinforced concrete:	2,500 Afs per cu.m.

**F. Cost of Machinery**

**Looms**

Type of looms: FA Japan; AT-100 - 5m - Russia; BECCO -  
Pakistan; L - Nortarop - England;  
All are Automatic Power Looms.

Shuttle Box: 1 x 1  
 Reed space : 113 cm; (44")  
 Revolution : 200 rpm - "economical"  
 Efficiency : 80% = of total working time  
 Working hrs: 24 per day; three shifts at 8 hours  
 Nos. of Loom: I : 50 sets; II 100 sets; III 200 sets  
 Capacity :  $\frac{200 \times 60 \times 24 \times 0.80}{100 \times 20} = 115 \text{ m p D \& Loom}$

Annual output: Daily x 300 = 34,500 meters per year and  
loom

I : 1,750,000 meters per year;  
 II: 3,500,000 meters per year;  
 III: 7,000,000 meters per year

**G. Machinery and Equipment costs based on the following  
bids**

Russian offer contract no. 83; 1966  
 Japanese offer PREET SINGH; 1966  
 BECCO - Pakistan; Automatic Power Loom - offer 1967  
 Other offers - presently at the Planning and Project  
 Department.

All prices calculated and estimated for installation  
 at the site.

	I 50 Looms	II 100 Looms	III 200 Looms
Loom - 100,00 Afs each	5,000,000	10,000,000	20,000,000
Winding machines	750,000	750,000	800,000
Warpers and creels	488,000	488,000	488,000
Sizing machines	1,350,000	1,350,000	1,350,000
Warp Tying machines	53,000	53,000	53,000
Autom. Pirn Machines 2x2	700,000	1,400,000	2,100,000
All-purpose shearing machines	1,275,000	1,275,000	1,275,000
Inspecting & measu- ring machines	169,000	169,000	169,000
Diesel Generator	1,500,000	2,200,000	3,000,000
Boiler	1,500,000	1,500,000	2,000,000
Workshop equipment	1,200,000	1,000,000	1,000,000
<b>Gross total (includ- ing spare parts)</b>	<b>13,885,000</b>	<b>20,435,000</b>	<b>32,230,000</b>

H. Buildings, Land, Fixtures, installations,  
Furniture, etc.

	I	II	III
- Land sqm	3,420	4,420	8,000
- Building complete (sqm) all included	1,545	2,070	3,915
<b>Costs</b>			
- Land, 20 Afs/sqm	68,400	88,400	160,000
- Buildings, 7,500 Afs/ sqm	11,600,000	15,600,000	29,500,000
- Real estate only	11,668,400	15,688,400	29,660,000
- Real & Movable Property	25,553,400	36,123,400	61,594,000
- Contingencies 10% of Real & Movable Property	2,555,340	3,612,340	6,189,500
- <b>FIXED CAPITAL</b>	<b>28,108,740</b>	<b>39,735,740</b>	<b>68,084,500</b>
with correction	28,000,000	40,000,000	68,000,000

## I. OPERATION COSTS

	I	II	III
1. <u>Annual output:</u> <u>in meters</u>	1,750,000	3,500,000	7,000,000
2. <u>Direct material</u> <u>in kg</u>	206,000	412,000	824,000
Yarn yield 95% kg	217,000	434,000	868,000
Yarn cost (45Afs/kg)	9,800,000	19,600,000	39,200,000
3. <u>Supplies</u>			
Spare Parts 2% on Machinery	278,000	410,000	645,000
- Maintenance 1%	139,000	205,000	322,000
- Tools 0.3%	42,000	61,500	96,000
- Lubricants 1.5%	42,000	61,500	96,000
- Office Supplies 1% of Manpower	14,150	20,270	39,470
Total supplies in Afs per year	505,150	758,270	1,189,970
4. <u>Power, Fuel, Water, etc.</u>			
- Electric Power	371,000	534,000	887,000
- Fuel for Boilers kgs/year	168,000	237,000	402,000
- Electricity in Fuel + Fuel Total (kgs)	261,000	361,000	624,000
Fuel 5 Afs/kg			
Total	1,305,000	1,802,000	3,120,000
5. <u>Labour</u>	I	II	III
Manager	1	1	1
Supervisor	1	1	1
Office	2	2	3
Other	6	6	8
Skilled	10	10	12
Semiskilled	70	112	184
Unskilled	31	46	56
Total	121	173	265

Annual Wages & Salaries	1,374,000	1,968,000	2,958,000
Training 3% of Wages	41,000	59,000	89,000
Total Manpower	1,415,000	2,027,000	3,047,000

**K. Other costs: 0.7% of net sales**

Total	79,000	157,000	314,000
Annual net sales total Afs per year	15,750,000	31,500,000	63,000,000

**Annual operation costs in Afs**

Direct Materials	9,800,000	19,600,000	39,200,000
Supplies	505,150	758,270	1,189,970
Power	1,305,000	1,805,000	3,120,000
Manpower	1,415,000	2,027,000	3,047,000
Other costs	79,000	151,000	314,000
	<u>13,104,150</u>	<u>24,347,270</u>	<u>46,870,970</u>

**Working Capital No. of mths.**

- Material & Supplies	2	1,710,000	3,380,000	6,720,000
- Power, etc.	1	109,000	151,000	260,000
- Manpower	1	118,000	170,000	10,500,000
- Other Costs	2	13,000	26,000	53,000
Total		<u>4,570,000</u>	<u>8,977,000</u>	<u>17,787,000</u>

**INVESTMENT CAPITAL**

Real Estate	11,668,000	15,688,400	29,660,000
Movable Assets	13,885,000	20,435,000	32,235,000
Working Capital	4,570,000	8,977,000	17,787,000
	<u>31,123,000</u>	<u>45,100,400</u>	<u>79,682,000</u>
Interest during construction 9.4%	2,930,000	4,250,000	7,500,000
TOTAL INVESTMENT CAPITAL	<u>34,000,000</u>	<u>49,000,000</u>	<u>77,000,000</u>

- Useful life of factories: 12 years
- Capital recovery at an interest rate of 6%

Gross Profit (per year)

	I	II	III
Net sales	15,750,000	31,500,000	63,000,000
Operation costs	13,104,150	24,347,270	46,870,970
Total	2,645,850	7,152,730	16,129,030

Internal Interest Rate

Gross Profit: Total Net Investment - (from Tables)

- $\frac{2,645,850}{34,000,000}$	0.078	-	-
- $\frac{7,152,730}{49,000,000}$	-	0.146	-
- $\frac{16,129,030}{77,000,000}$	-	-	0.209

Other capacities

- Annual Output meters	10,000,000	20,000,000
- Net investment Afs	95,000,000	142,000,000
- Net sales Afs	90,000,000	180,000,000
- Annual operation costs Afs	05,000,000	130,000,000
- Gross Profit	25,000,000	50,000,000
- Internal Interest Rate	0.263	0.351

Annex No. 2

BALUCH TEXTILES COMPANY

(Graph No. 4)

Net Fixed Investment

- Real estate and services	59,350,000 Afs
- Movable property including all engineering services	344,650,000 Afs
- Contingencies 10%	40,000,000 Afs
- Working capital	33,000,000 Afs
- Interest on company capital	<u>16,722,000 Afs</u>

Gross fixed investment:  
(Net Investment) 494,122,000 Afs

- Interest on loan	<u>36,500,000 Afs</u>
	580,622,000 Afs
	=====

Company Capital

10% cash payment	34,465,000 Afs
Buildings and supervision	59,350,000 Afs
Working capital	33,000,000 Afs
Contingencies (10% on fixed assets)	40,400,000 Afs
Interest on capital during 3 years construction	<u>16,722,000 Afs</u>

183,937,000 Afs  
=====

Less Working Capital 33,000,000 Afs

Total 150,937,000 Afs

Net fixed investment 494,122,000 Afs  
Less working capital 33,000,000 Afs

Left for depreciation 461,122,000 Afs  
=====

Gross profit

During initial period 64,000,000 Afs  
All calculations are based on interest rate of 6%

Annual Depreciation Rate

$$461,000,000 \div 12 = 38,417,000 \text{ Afs}$$

Interest on Investment Capital

at 6%

$$494,000,000 \times 0.06 = 29,640,000 \text{ Afs per year}$$



Annex No. 3

PREET SINGH TEXTILE COMPANY (Graph No. 5)

Net Fixed Investment (in U.S. Dollars)

- Real Estate and services	
- Movable property including all engineering services	
- Contingencies	
- Working capital	
- Interest on company capital	
Total net investment	1,570,000
- Left for depreciation, working capital excluded	1,404,000
<u>Gross Profit</u>	245,000
<u>Annual Depreciation rate</u>	
1,400,000 : 12	117,000 US\$ per year
<u>Interest on investment capital</u>	
at 6%	
1,570,000 x 0.06 =	94,200 US\$ per year
<u>Net Profit</u>	33,800 US\$ per year

Annex No. 4

## STEEL VENTURE

(Graph No. 13)

(Re) Rolling of Reinforcing bars and light section beams.

After examining the investment costs and expenditures for (re) rolling facilities in Afghanistan the following results were obtained:

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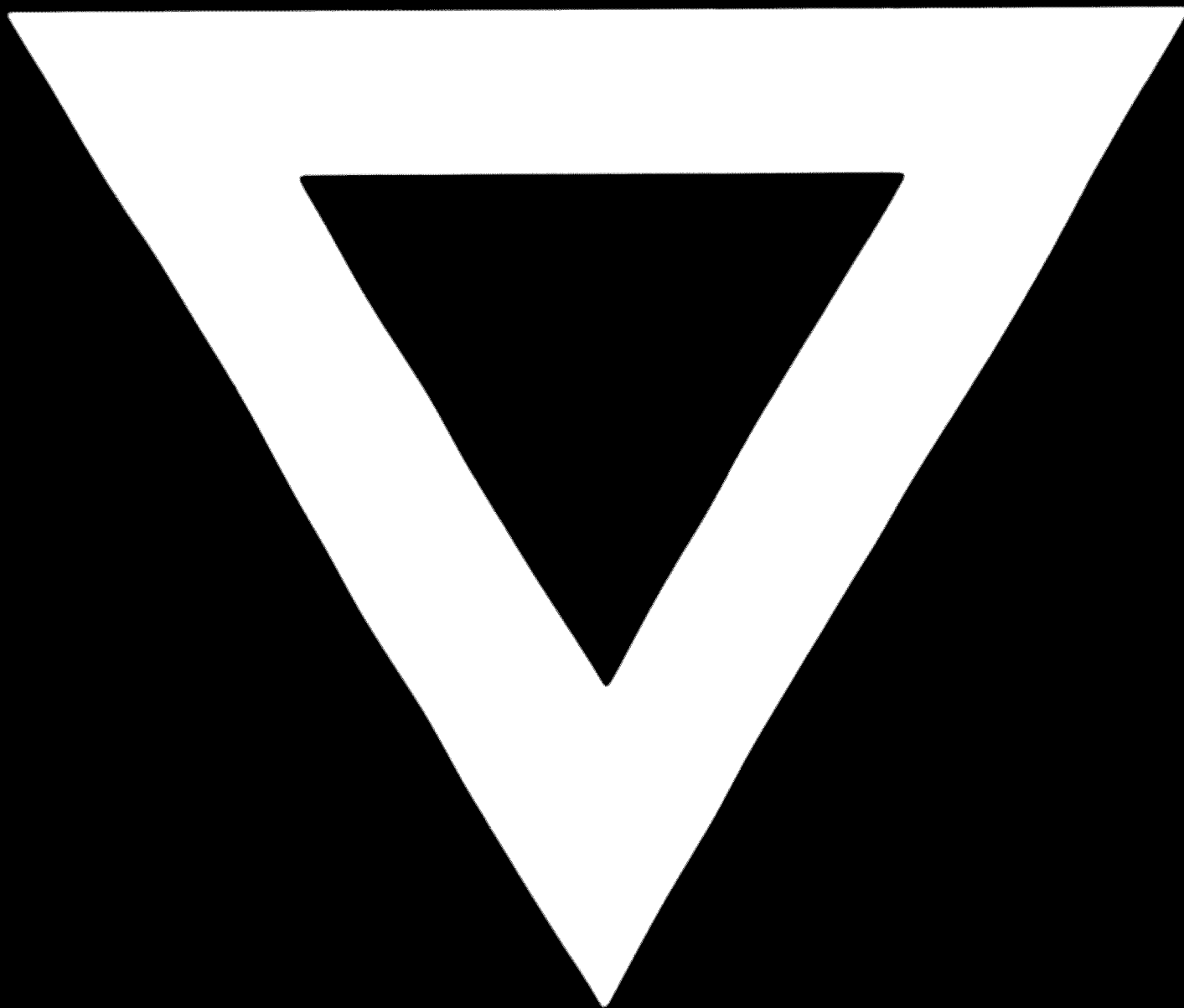
Annual output (metric tons)	1,500	10,000	15,000	30,000
Net sales (in 1000 Afs)	18,600	124,000	186,000	372,000
Fixed capital (in 1000 Afs)	9,000	150,000	150,000	150,000
Interest during 3 year construction period (in 1000 Afs)	900	15,000	15,000	15,000
Working capital	2,750	18,500	26,800	52,500
Investment capital (in 1000 Afs)	12,650	183,500	191,800	217,500
Operation cost (in 1000 Afs)	16,495	109,736	161,206	315,326
GROSS PROFIT (excl. TAXES) (in 1000 Afs)	2,105	19,244	25,794	56,674
Assumed Internal Interest Rate	0,166	0,078	0,135	0,260
75% of IIR	0,125	0,0585	0,101	0,195

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The above mentioned results are based on German and Pakistan offers and on the results of the market research in Afghanistan.

Particulars could be obtained at the Planning and Projects Department.

**C-572**



**84.12.03**

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