

PRE-FEASIBILITY STUDY FOR GLASS
INDUSTRY IN MENOUFIA PROVINCE

By

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INTRODUCTION

Glass Technology is no doubt- one of the most important and advanced one in the modern science, yet the subject is not receiving the required degree of attention in the research work in our universities. The main reasons are, firstly glass technology is a practical subject, that depend to a large extent on field know-now, secondly that a real and serious research necessitates investments, and thirdly because of the complicated nature of glass researches.

However, as in our Faculty of Engineering and Technology in Shebin El-Kom, much interest is paid to applied researches for rural development, it is necessary to establish a centre for glass technology and research.

To achieve this goal to author firstly carried a feasibility study for glass industry in Menoufia Province to emphasize the importance of such a research centre in the rural development. The feasibility study forecasted the production output of glass industry, mainly for container glass, for the coming years and the required investments.

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FEASIBILITY STUDY

GLASS INDUSTRY IN MENOUIA PROVINCE

Menoufia provice populated by 2×10^6 citizen has a good opportunity for rural development due to its location and facilities . It is a fact that the only way to achieve such a goal is to create industrial intergeration covering population needs. Glass industries are among such industries that must be motivated, the following report is a preliminary study

I - Demands Analysis :

We estimated the following demands lased on a field investigation by SHEBIN EL - KOM Faculty of Engineering and Technology .

ARTICLE	Average Yearly Cods./ person	Weight/ peice	Total weight gram.	Process	Glass Type
Large Bottl	1	350	350	Blowing	Soda-lime
Small Bottles	2	100	200
Large cups	2	100	200	Pressing
Small cups	2	75	150
Lamp Envelops	2	50	100	Blowing
Containers	1	500	500
Others	-	500	500	Pressing
			2000 gr.		

We assume demand depending on population, income level, effects of others industries.

As a function of the form :

$$D(t) = \phi [P(t), I(t), E(t)],$$

D(t) = Demand at time (t),

P(t) = Population at time (t),

I(t) = Income per capital at time (t).

It is difficult on the time being to evaluate we estimate 15% demand increase per year to cover there factor :

Yearly Net Demand In tons

1980	1981	1982	1983	1984	1985
4000	4600	5290	6100	7000	8050

overall prod . efficiency 60 % will produce the following furnace capacities (300 working day)

Furnace capacities in tons

1980	1981	1982	1983	1984	1985
22	25.5	29	33.5	38.5	44.5

A starting capacity of (30) tons/day is recommend.

II. Plant location:

Many factors may decide for plant location :

1. Availablrlity of land.
2. Near to teansportation means.
3. Near to supply of raw material.
4. Population interesting centre.

We revised many location and the best seeming are :

- A. KEWAISSNA CENTRE.
- B. EL-SHOWHADA.
- C. TELA.

The best is location (A) for transportation net-work, non-agriculture land and nearness to other industrial centres such that of TANTA and ALEXANDRIA, beside it is faraway from other competing glass industries in SIRS EL-LAYAN.

Estimated Project Capital

ITEM	Cost		Total Cost	
	Local cur.	For. Curr.	Loc. Cur.	For. Curr.
<u>I- Fixed Capital :</u>				
I-(1) land Area = 2500 mt ²	100,000			
I-(2) Building & construction	200,000			
I-(3) Machinerion equipments				
3.1 - Furnaces and auxili- aroes	50,000	150,000		
3.2 - Blowing Machineries		100,000		
3.3 - Pressing Machinerion		75,000		
3.4 - Annealing	20,000	50,000		
3.5 - Finishing Machineries		75,000		
3.6 - Engine Room	120,000			
I-(4) Internal Transport Means	20,000			
I-(5) External Transport Means	40,000			
I-(6) Furniture and Management auxiliary equipments	5,000			
			555,000	450,000

ITEM	Cost		Total Cost	
	Local Cur.	For. Curr.	Loc. Cur.	For Curr.
II- Installation Cost:				
II-(1) Wages and salaries	20,000			
II-(2) Experts Reserches and Experiment	10,000	10,000		
II-(3) Project Design Expenses	10,000			
II-(4) Training Expenses	10,000	10,000		
II-(5) Office and managerial Expenses.	5,000			
			55,000	20,000
I- Fixed Capital			555,000	450,000
II-Installation Cost			55,000	20,000
Total Investment Cost			610,000	470,000
III- working Capital	200,000	50,000		
Total Project Cost			810,000	520,000

Annual Cost

ITEM	Cost		Total Cost	
	Loc. Cur.	For. Cur.	Loc. Cur.	For. Cur.
I - <u>Operating Expenses :</u>				
I-(1) Raw Materials	600,000	50,000		
I-(2) Wages and Salaries	75,000			
I-(3) Fuel and Electrical power	30,000			
I-(4) Maintenance and spare parts	20,000	80,000		
I-(5) Insurance	10,000			
			735,000	130,000
II- <u>Administration Expenses :</u>				
II-(1) Wages and Salaries for Services	15,000			
II-(2) Wages and Salaries for Technical	15,000			
II-(3) Wages for high Management	10,000			
II-(4) Raw Material and Exuipment for Berives	10,000			
II-(5) Lighting and water and Rent	6,000			

ITEM	Cost		Total Cost	
	Loc. Cur.	For. Cur.	Loc. Cur.	For. Cur.
II-(6) Insurance for labors	10,000			
II-(7) Telefne + Post + Telex	4,000			
			70,000	
III- <u>Selling Expenses</u> :				
III-(1) Wages and Salaries and Commissions	20,000			
III-(2) Advertisement	10,000			
III-(3) Packing	20,000			
			50,000	
IV - <u>Depreciation</u> :				
IV-(1) Building (2 ½ %)	5,000			
IV-(2) Machineries (10 %)	52,000			
IV-(3) Transportation EQ. (20 %)	12,000			
IV-(4) Furniture (10 %)	-,500			
IV-(5) Installation Cost (10 %)	7,500			
			77,000	
			932,000	130,000
Total Annual Cost				

Average Cost Price per ton of glass 100 L.E.

Profit 30 %

average selling price 1 ton = 130 L.E.

Estimated selling price of products Bottles :

ARTICLE	Weight/PC. gram.	Selling Price piastros
Large Bottles	350	4.55
Small Bottles	100	1.30
Large Cups	100	1.30
Small Cups	75	0.98
Lamp Envelops	50	0.65
Containers	500	6.50
Others	500	6.50
	1675 gr.	21.78 pu.

PROJECT SPECIFICATIONS

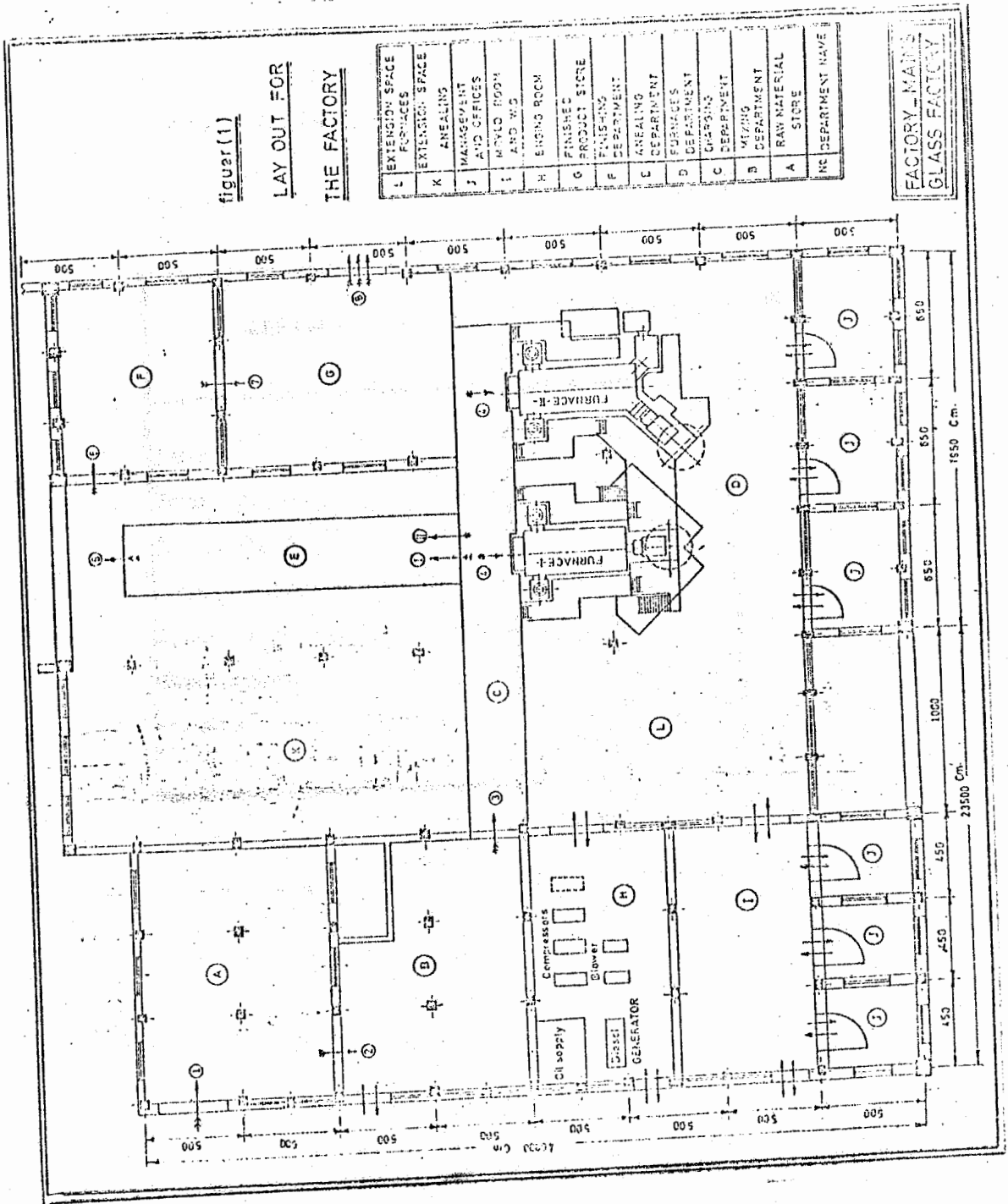
- I - Furnaces and auxiliaries : " two furnaces "
- 1 - Melting Capacity 15 ton / day equipped with all accessories measuring and control devices for fuel and air and draught
 - 2 - Automatic Batch - Charging
 - 3 - Fully automatic feeder temp control and glass doring
- II - Blowing Machine :
- Highly flexible Blowing Machine for diversified size and shape (bottles - envelops etc) with average out - put of 30×10^6 peices per year .
- III- Pressing Machine :
- Highly flexible pressing Machine for diversified size and shape with average out - put of 30×10^6 peices per year .
- IV - Annealing Leher :
- Annealing Leher of nat less than 20 mt length for annealing of various products transfer speed 2 mt / min .
annealing temp. 600 C°
- V - Engine Room :
- 1 - Two Fuel pompes 250 L/h. 8 kg./cm.
 - 2 - Two compressor $400 \text{ mt}^3 / \text{min}$. max. Press. $6 \frac{\text{kg}}{\text{cm}^2}$
 - 3 - Two Blower $100 \text{ mt}^3 / \text{min}$.
 - 4 - One Diesel Generator 400 K.V.A.
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figuar(1)

LAY OUT FOR
THE FACTORY

L	EXTENSION SPACE
K	EXTENSION SPACE
J	MANAGEMENT AND OFFICES
I	MOULD ROOM AND W.D.
H	ENGINE ROOM
G	FINISHED PRODUCT STORE
F	FINISHING DEPARTMENT
E	ANNEALING DEPARTMENT
D	FURNACE'S DEPARTMENT
C	CRACKING DEPARTMENT
B	MIXING DEPARTMENT
A	RAW MATERIAL STORE
MC	DEPARTMENT NAME

FACTORY - MAIN
GLASS FACTORY



COST-BENEFIT ANALYSIS

I. DIRECT PROJECT EFFECTS:-

Total project cost = 1,330,000 L.E.
Total Annual Return = 30 x 4000 = 120,000
Pay - Back Period = $\frac{1,330,000}{11}$ = 12 Years.

- N.B. (1) This long pay-Back period is due to the fact that this project is meant for social purposes and only 30% profit is assumed for selling profits.
- (2) The Installation periods one year for the first furnace and 3 years for full capacity prod.
- (3) The International price of one ton of this type of glass is 600 L.E. if this is taken into consideration then pay-back periods 3 Years.

II- LABOUR

The Estimated labour is as follows:-

DEPARTMENT	Prep. Ed.	Secondary tech.	Bsc.	Total
PRODUCTION	38	24	2	64
MAINTENANCE	12	16	2	30
ADMINISTR ATI.	-	12	2	14
			Total	108

III- ECONOMIC AND SOCIAL BENEFITS:-

- (1) Low product price:-

Annual Saving is (600-100) = 500 L.E./Ton.
 $500 \times 4000 = 2 \times 10^6$ L.E./year.

- (2) Creation of glass know-How.
- (3) Intergation of bottling and container Industry.
- (4) Rural Development.
- (5) Creation of more than 100 work oppertunities.

IV- SOCIAL COSTS:-

Very minor social costs is estimated:-

- (1) The loss of land of Area 2500 mt² for agriculture or landscape.
- (2) The only harm is the prssibility of occupational diseases of silicon oxide effect (sand) known as silicoses.
- (3) Pollution from chimenies can be nglected and the effect or row material only Insides factory.

V- OTHER PROSPECTS:-

This glass pilot project will help later-on to develop the area on other lidustres related to the same field such as:

- (1) Vitrified products.
- (2) Refractory Material Industries.

VI- RECOMMENDATION:-

We recommend the installation of glass industry in
MENOUFIA PROVINCE

Referenes:-

S. Raef "Glass ceantainer Menvfacturing:- From the past into the Future".

Jr. Sc., Glass Tech., Vol. (20), No. (6), DEC. 1979.

دراسة تمهيدية في الجدوى الاقتصادية لإنشاء

صناعة زجاج في محافظة المنوفية

د. د. محمد الهادي عبد الباري ناصر ، د. د. لطفى لويز سيفين ، د. د. سعاد محمد سراج
م. محمد محمود جاد و

تم اجراء الدراسات التالية :

- ١ - تحليل الطلب على انواع منتجات الزجاج وخاصة المنزلية منها وقد أمكن التنبؤ بكميات الزجاج المتوقعة حتى عام ١٩٨٥ .
- ٢ - تأسيسا على ذلك تم تحديد طاقات افران صهر الزجاج وماكينات التشغيل والتخير والتشطيب اللازمة لذلك .
- ٣ - تم اجراء دراسة لأسعار المعدات ورأس المال الثابت والتخير وجدولتها في تقدير رأس المال اللازم للمشروع بالعملة الحرة والمصرية .
- ٤ - تم تحديد نوعيات الماكينات اللازمة ومواصفاتها اللازمة لتحقيق الانتاج طبقا لحجم الطلب المتوقع .
- ٥ - تم تحديد سعر المنتج تأسيسا على ما سبق تقديره من المعدات والآلات ومصروفات التشغيل السنوية .
- ٦ - تم اقتراح تخطيط موقع المصنع ومعداته وأقسامه المختلفة التي تخدم افران الصهر .
- ٧ - أمكن تحديد المنافع والآثار المترتبة على اقامة صناعة الزجاج - ويمكن تلخيص ماتم التوصل اليه كما يلي :
اولا : تكلفة انتاج طن الزجاج يساوى ١٠٠ جنيه مصرى مقارنة بتكاليف الأسعار العالمية التي تصل الى ٦٠٠ جنيه للطن الواحد .
ثانيا : الطاقة الانتاجية الابتدائية ٤٠٠٠ طن سنويا تصل الى ثمانية الاف طن فى العام الخامس من بدء الانتاج .

- ثالثا : رأس المال مردود الى اسعار عام ١٩٧٩ ٠٠٠ر٣٣٠ اجنيه مصرى .
- رابعا : فترة استرداد رأس المال ثلاث سنوات من بداية الانتاج .
- خامسا : يحقق المشروع وفرا في العملات الحرة ويخلق مجال لمائة فرصة عمل ، ويمكن اهمال اثار التلوث والأمراض المهنية الناتجة من التشغيل .
- سادسا : يحقق المصنع المقترح تكاملا لصناعة الزجاج بالمنطقة وخاصة زجاجات التعبئة والحلويات فضلا عن المنتجات الزجاجية اللازمة للبيئة .
- سابعا : ستكون هذه الصناعة ركيزة للمعرفة التكنولوجية في هذا المجال الذى يمكن امتداده ليشمل المنتجات الحرارية والتزجيبية بوجه عام .

التوصيات :

- استنادا الى ماسبق توضحه نصى بالبدء بإنشاء صناعة صغيرة للزجاج بمحافظة المنوفية لتفى بمتطلبات البيئة من مختلف أنواع الزجاج للأغراض المنزلية وللعمل على تكامل تصنيع الاقليم في المنطقة الصناعية بقوسنا .