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# PROPOSAL CONCERNING SETTING UP BRICKWORKS IN LIBYA [1]

by

Economic Commission for Africa

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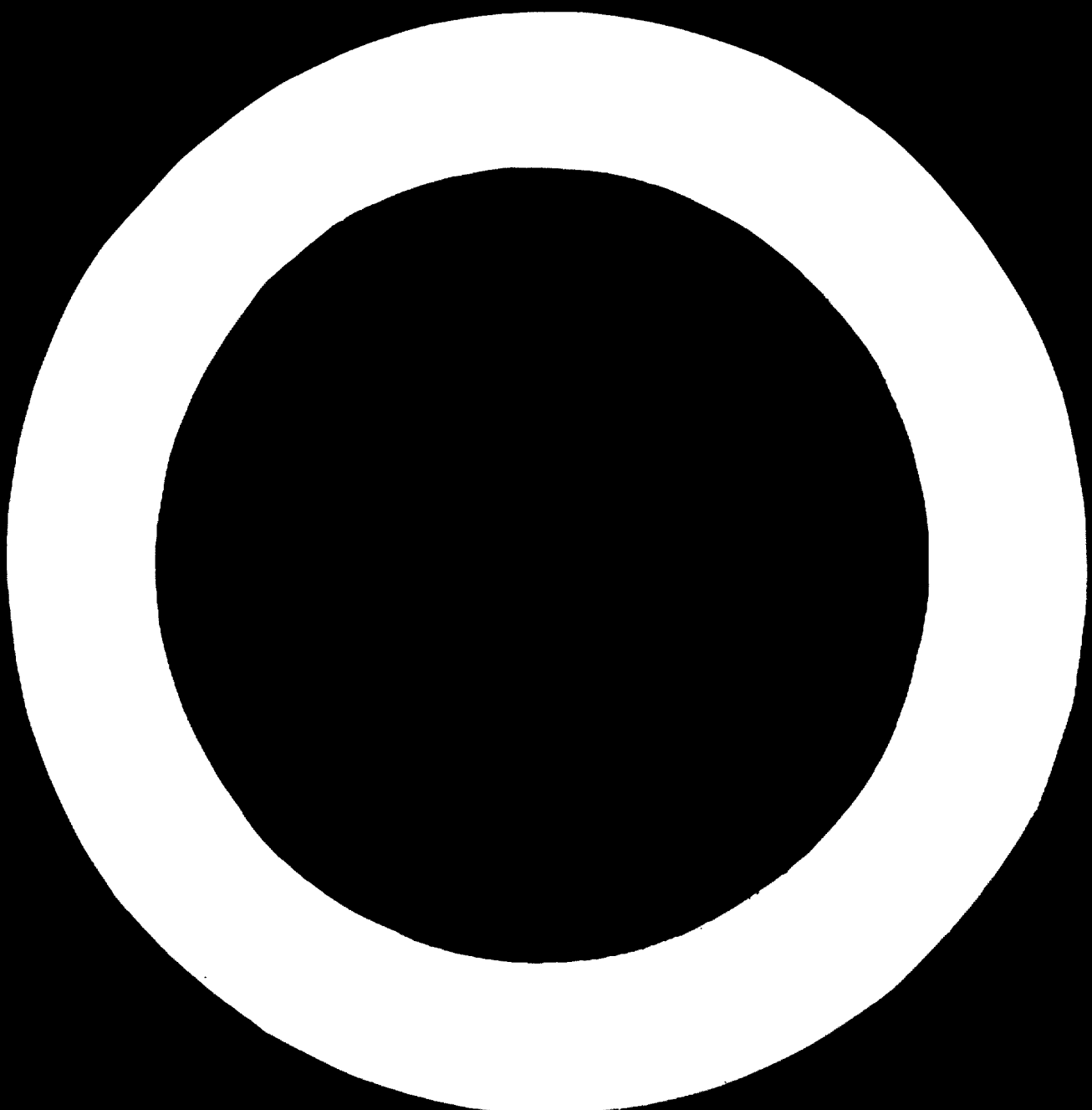


Libya - brickworks

Main data of the proposed factories

| | | |
|---|---|---|
| Location and output | : | 140,000 tons in Tripolitania, 80,000 tons in Tripolitania, 80,000 tons in Cyrenaica |
| Investments total | : | 1x3.6 + 2x2.2 = 8.0 million $US |
| Employment | : | 1x240 + 2x160 = 560 persons |
| Gross turnover | : | 2x1.14 + 1x1.84 = 4.12 million $US per year |
| Value added | : | 65.7% of gross turnover |
| Programme of action | : | 1970-71 geological investigation; |
| | | 1971-72 laboratory evaluation, study, project; |
| | | 1972-74 construction, training of selected workers; |
| | | 1975 start up; |
| | | 1975-76 full production. |
| Life of the plant | : | 25 years (minimum) |

## Summary and Conclusions

In North Africa bricks have for a long time been the traditional material used in construction. In all the Maghreb countries many brickworks may be found which produce bricks, hollow ceiling pots and tiles of very good quality. Indeed, often their quality may even be termed excellent. Mention may be made of many important buildings constructed of brick in all the North African countries. In all these countries, we find relatively extensive production by local artisans in addition to industrial production. In Libya, there is no industrial production, and part of the requirement, about 22-25 per cent, is filled through artisans' production, and the rest of the requirement, i.e., 75-78 per cent, is imported. Because the market has already reached the size allowing the creation of the domestic industrial production of red clay products, based on studies of the construction development in Libya and hence the consumption of bricks and tiles, ECA proposes that three brickworks could be set up in Libya: one with an output of 150 thousand tons, the second one with an output of 80 thousand tons, both in tripolitania and the third one with an output of 80 thousand tons in Cyrenaica.

Profitability and break-even sales volumes are estimated to be as follows in the year 1975:

## Pro-forma Statement of Profitability
## in first year of normal production

in thousand US$

| Output in tons per year | 80,000 | | 140,000 | | 2x 80,000 + 1x140,000 | |
|---|---|---|---|---|---|---|
| | 1000$ | per cent | 1000$ | per cent | 1000$ | per cent |
| Sales net of taxation | 1,139.4 | 100.0% | 1,823.1 | 100.0% | 4,101.9 | 100.0% |
| a) materials | 37.6 | 3.3 | 65.8 | 3.6 | 141.0 | 3.4 |
| b) labour | 153.4 | 13.5 | 232.2 | 12.7 | 539.0 | 13.1 |
| c) manufacturing overhead ) fuel | 74.4 | 6.5 | 130.2 | 7.2 | 279.0 | 6.8 |
| ) electroenergy | 102.4 | 9.0 | 179.2 | 9.8 | 384.0 | 9.4 |
| water (1/2) | 4.0 | 0.4 | 7.0 | 0.4 | 15.0 | 0.4 |
| depreciation | 196.0 | 17.2 | 324.0 | 17.8 | 716.0 | 17.4 |
| insurance | 22.0 | 1.9 | 36.0 | 2.0 | 80.0 | 2.0 |
| indirect labour | 51.0 | 4.5 | 70.0 | 3.8 | 172.0 | 4.2 |
| indirect materials | 30.0 | 2.6 | 48.0 | 2.6 | 108.0 | 2.6 |
| maintenance | 39.0 | 3.4 | 66.0 | 3.6 | 144.0 | 3.5 |
| Total | 518.8 | 45.5 | 860.4 | 47.2 | 1.898.0 | 46.3 |
| Cost of sales (a+b+c) | 709.8 | 62.3 | 1,158.4 | 63.5 | 2,578.0 | 62.8 |
| Gross profit | 429.6 | 37.7 | 664.7 | 36.5 | 1,523.9 | 37.2 |
| General and Administrative Expenses | 17.7 | 1.5 | 17.7 | 1.0 | 53.1 | 1.3 |
| Selling expenses | 7.6 | 0.7 | 7.6 | 0.4 | 22.8 | 0.6 |
| Sub-Total | 25.3 | 2.2 | 25.3 | 1.4 | 75.9 | 1.9 |
| Operating profit | 404.3 | 35.5 | 639.4 | 35.1 | 1,448.0 | 35.3 |
| Interest (long term) | 59.4 | 5.2 | 97.2 | 5.3 | 216.0 | 5.2 |
| (short term) | 12.0 | 1.1 | 20.0 | 1.1 | 44.0 | 1.1 |
| sub-total | 71.4 | 6.3 | 117.2 | 6.4 | 260.0 | 6.3 |
| Pre-tax net income | 332.9 | 29.2 | 522.2 | 28.7 | 1,188.0 | 29.0 |
| Pre-tax net income to sales | 29% | | 29% | | 29% | |
| Pre-tax net income to total cap. Investment | 15% | | 15% | | 15% | |

## Break-even sales volume

in US$ 1,000

| Output in tons per year | 80,000 | 140,000 | 2x 80,000 + 1x140,000 |
|---|---|---|---|
| Sales (net of taxation) | 1,139.4 | 1,823.1 | 4,101.9 |
| **Fixed expenses:** | | | |
| -general and admin. expenses | 17.7 | 17.7 | 53.1 |
| -selling expenses | 7.6 | 7.6 | 22.8 |
| -indirect labour | 51.0 | 70.0 | 172.0 |
| -20% of direct labour | 30.7 | 46.4 | 107.8 |
| -interest (long term) | 59.4 | 97.2 | 216.0 |
| -interest (short term) | 12.0 | 20.0 | 44.0 |
| -depreciation | 196.0 | 324.0 | 716.0 |
| -insurance | 22.0 | 36.0 | 80.0 |
| Total fixed expenses | 396.4 | 618.9 | 1,411.7 |
| **Variable expenses** | | | |
| -materials | 33.6 | 58.8 | 126.0 |
| -80% of direct labour | 122.7 | 185.8 | 431.2 |
| -indirect materials | 30.0 | 48.0 | 108.0 |
| -maintenance | 39.0 | 66.0 | 144.0 |
| -fuel | 74.4 | 130.2 | 279.0 |
| -electro-energy | 102.4 | 179.2 | 384.0 |
| -water | 8.0 | 14.0 | 30.0 |

**Break-even sales volume - continued**

| | $ 1000 | per cent | $ 1000 | per cent | $ 1000 | per cent |
|---|---|---|---|---|---|---|
| Sales | 1,139.4 | 100.00 | 1,623.1 | 100.00 | 4,101.9 | 100.00 |
| Less variable expenses | - 410.1 | 35.99 | - 682.0 | 37.41 | -1,502.2 | 36.62 |
| Contribution | 729.3 | 64.01 | 1,141.1 | 62.59 | 2,599.7 | 63.38 |
| Less fixed expenses | - 396.4 | 34.79 | - 618.9 | 33.95 | -1,411.7 | 34.42 |
| Net income pre-tax | 332.9 | 29.22 | 522.2 | 28.64 | 1,188.0 | 28.96 |
| Fixed expenses / Contribution % = Break-even volume | 619.3 | | 988.8 | | 2,227.4 | |
| Sales at Break-even | 619.3 | | 988.8 | | 2,227.4 | |
| Variables at, % of Break-even | 222.9 | | 369.9 | | 815.7 | |
| Fixed expenses | 396.4 | | 618.9 | | 1,411.7 | |
| Total expenses | 619.3 | | 988.8 | | 2,227.4 | |
| Profit | | n o n e | | | | |

The output of the brickworks, because of the fluctuation of the market, is 85 per cent of the theoretical capacity. Under optimum market conditions the output of brickworks could reach 96 per cent of theoretical capacity, i.e. 90,000 tons, 90,000 tons and 158,000 tons, respectively. In this case there should be an additional income, as follows:

| Production ton per year | 90,000 | 158,000 | 338,000 |
|---|---|---|---|
| Sales $ 1000 | 1,278.0 | 2,085.6 | 4,641.6 |
| Less sales at Break-even | 619.3 | 988.8 | 2,227.4 |
| | 656.7 | 1,096.8 | 2,414.2 |
| Less variables (proportional) | 237.1 | 410.3 | 884.5 |
| Net income (96 per cent capacity) | 421.6 | 686.5 | 1,529.7 |
| Net income (85 per cent capacity) | 332.9 | 522.2 | 1,188.0 |
| Additional income | 88.7 | 164.3 | 341.7 |

Introduction

In Libya the need of walling materials for construction is met by concrete blocks, red bricks and cut stone blocks. The need of red building materials, i.e. bricks, both solid and hollow, as well as the need of roofing tiles is met mainly by imports and partly by artisans' production. There is only small-scale artisan production of solid bricks. It is estimated that in 1964 production amounted to 4 million single bricks, that is about 14,000 tons, and that in 1965 the figures were 4.65 million single bricks, or 16,000 tons. At the same time 32,647 tons of bricks were imported in 1964 and 51,500 tons in 1965. During this period the production of cut stones accounted for about 17.5 million blocks or 350,000 cu.m., in other words, production was estimated at 875,000 tons.

The importance of red bricks and tiles is growing with the increasing construction and that is why ECA recommends the start of domestic industrial production of bricks and tiles in Libya.

The following goods are dealt with in this proposition:

| BTN | SITC | |
|---|---|---|
| 69.04 | 662.4(1) | Building bricks |
| 69.05 | 662.4(2) | Roofing tiles |

The evolutionary trend in the consumption of bricks and tiles

Production and import of bricks and tiles in Libya were as follows:

| | B R I C K S | | | T I L E S | | | Bricks and tiles apparent consumption |
|---|---|---|---|---|---|---|---|
| Year | Production | Import. | | Production | Import | | |
| | t | t | 1000$ | t | t | 1000$ | t |
| 1964 | 14,000 | 32,647 | .673 | - | 7,453 | 202 | 54,100 |
| 1965 | 16,000 | 51,492 | .947 | - | 2,082 | 114 | 69,574 |
| 1966 | (25,000) | 75,545 | 1,532 | - | 3,531 | 161 | 104,076 |
| 1967 | 25,000 | 85,042 | 1,832 | - | 1,687 | 99 | (111,729) |
| 1968 | (25,000) | 92,434 | 2,217 | - | 2,008 | 201 | 122,442 |

The Gross Domestic capital Formation, Gross Domestic Product, and investments in conetruction in this period were as follows in US$ million at constant market prices of 1964:

| | 1964 | 1965 | 1966 | 1967 |
|---|---|---|---|---|
| GDP | 1,057.0 | 1,337.3 | 1,558.2 | 1,748.9 |
| GDCF | 300.7 | 373.5 | 397.6 | 427.0 |
| Construction | 104.4 | 158.5 | 176.7 | 223.2 |
| GDCF as % of GDP | 28.5 | 27.9 | 25.5 | 24.4 |
| Construction as % of GDCF | 34.7 | 42.4 | 44.4 | 52.3 |
| Construction as % of GDP | 9.9 | 11.9 | 11.3 | 12.8 |

Development projects.

The projection of the future demand is based on the growth of the national economy, growth of capital formation, and hence of bricks consumption. The projection of this macro-economic data appears in several UN documents (see references) and is as follows:

| | | 1964 | 1970 | 1975 | 1980 |
|---|---|---|---|---|---|
| GDP | $ mln | 1,057 | 2,160 | 3,000 | 4,200 |
| GDCF | " | 300.7 | 540 | 640 | 840 |
| Construction | " | 104.4 | 297 | 365 | 504 |
| Brick consumption | tons | 54,100 | 240,000 | 255,000 | 350,000 |
| | thousand pcs | 15,457 | 69,000 | 73,000 | 100,000 |

Note: at constant 1964 prices

A very important indicator of brick-consumption is the consumption of bricks expressed in prices per thousand dollars investment in construction. This indicator in Libya is:

| | 1964 | 1965 | 1966 | 1967 | 1970 | 1980 |
|---|---|---|---|---|---|---|
| Brick-consumption in prices per 1000$ investment in construction | 148 | 125 | 168 | 143 | — 200 — | |

This indicator was in 1964 in: Algeria - 614
Tunisia - 197
Morocco - 194

The present situation

In Libya, there are only two brickworks, both situated in Tripoli, which produce solid bricks, floor elements and tiles. It is estimated that in 1964 production amouted to 4 million single bricks or 14,000 tons, and that in 1965 the figures were 4.65 million single bricks - that is 16,000 tons. The 1966 output is estimated at about 25,000 tons of red clay products, which is equal to 90 per cent of present rate of capacity utilization.

Concrete blocks, known as parpens or agglomerates always constitute a product, that competes with bricks, as do asbestos cement slabs with roofing tiles. Substitutes for bricks and tiles can, however, only be utilized within certain limits, and as the modernization of brick production proceeds, they will always be competitive with other materials. In North Africa, white houses are traditional. In former times the practice of plastering and painting houses white was adopted for the sole purpose of reflecting the suns' rays. Nowadays, the insulating properties of bricks are of such an advanced standard that it is possible to introduce with them a new element into architectural construction and architecture in North Africa, by erecting brick walls without external plastering. This helps to make much of construction more economical.

A considerable contribution is also made in Libya by natural soft stone, which is very white in colour and is cut into blocks 40x20x10 cms. In 1964-65, this production accounted for about 17.5 million blocks, or 350,000 cu.m. Mechanization of this process is being carried out.

Notwithstanding, the use of competitive concrete blocks and natural stone blocks, red clay products have their field of utilization in the construction and hollow ceiling pots (hourdis) and hollow walling blocks are supposed to represent the bulk of consumption in the future.

Every country has to be self-sufficient in red-clay building materials and therefore ECA considers that it could be important for Libya to create an efficient domestic brick industry. Bricks and tiles are heavy and bulky, and hence their transport is expensive. The

domestic production of bricks can improve the market, not so much because of a direct selling effort by the manufacturers of bricks, but because the domestic production of bricks is cheaper; in the case of Libya the winning and shaping of stone will become uneconomical for normal building, owing to increased wage rates of quarry workers.

Because the new brickworks can enter into production in 1974-75 only, and the need for bricks and tiles in 1975 is expected to be 250-260 thousand tons, the Economic Commission for Africa is proposing the establishment of three brickworks in Libya, one with an output of about 140,000 tons, one with an output of 80,000 tons, both in Tripolitania, and the third one with the output of 80,000 tons in Cyrenaica.

The analysis of production costs is in Annexe I and the main economic features are as shown below:

Analysis of the manufacturing costs of bricks and tiles in US$ 1000

| Production in tons per year | 80,000 | | 140,000 | | 2x 80,000 1x140,000 | |
|---|---|---|---|---|---|---|
| | $ 1000 | % | $ 1000 | % | $1000 | % |
| Wages and Salaries | 205.1 | 18.04 | 292.4 | 15.88 | 702.6 | 17.08 |
| Social charges | 24.6 | 2.16 | 35.1 | 1.91 | 84.3 | 2.05 |
| Depreciation | 196.0 | 17.25 | 324.0 | 17.60 | 716.0 | 17.41 |
| Net profit | 330.0 | 29.04 | 540.0 | 29.33 | 1,200.0 | 29.17 |
| Value added | 755.7 | 66.49 | 1,191.5 | 64.72 | 2,702.9 | 65.71 |
| Maintenance | 69.0 | 6.07 | 114.0 | 6.19 | 252.0 | 6.13 |
| Interest-long term loan | 59.4 | 5.23 | 97.2 | 5.28 | 216.0 | 5.25 |
| Interest-short term loan | 12.0 | 1.06 | 20.0 | 1.09 | 44.0 | 1.07 |
| Insurance and miscellaneous | 22.0 | 1.94 | 36.0 | 1.96 | 80.0 | 1.94 |
| Fuel | 74.4 | 6.54 | 130.2 | 7.07 | 279.0 | 6.78 |
| Electricity | 102.4 | 9.01 | 179.2 | 9.74 | 384.0 | 9.33 |
| Water | 8.0 | 0.70 | 14.0 | 0.76 | 30.0 | 0.73 |
| Raw material | 33.6 | 2.96 | 58.8 | 3.19 | 126.0 | 3.06 |
| Intermediate Inputs | 380.8 | 33.51 | 649.4 | 35.28 | 1,411.0 | 34.29 |
| Gross turnover | 1,136.5 | 100.00 | 1,840.9 | 100.00 | 4,113.9 | 100.00 |
| Cost of single bricks $ per ton | 14.2 | | 13.2 | | 13.7 | |

Composition of investment

| | | | | | 2x 80,000 +1x140,000 | |
|---|---|---|---|---|---|---|
| Production in tons per year | 80,000 | | 140,000 | | 320 | |
| Land | 100 | | 120 | | 2,940 | (1,760) |
| Construction | 770 | (460) | 1,400 | (840) | 3,490 | (3,490) |
| Equipment | 960 | (960) | 1,570 | (1,570) | 860 | ( 510) |
| Equipment Erection | 240 | (140) | 380 | (230) | 390 | ( 150) |
| Start-up Expenses | 130 | ( 50) | 130 | ( 50) | 320 | |
| Working capital | 100 | | 120 | | | |
| Total, excluding land | 2,200 | (1,610) | 3,600 | (2,690) | 8,000 | (5,910) |

Note: Figures in parentheses show the component in foreign currency.

Pay-out Period

To calculate pay-out period, there are two formulae:

$$T_1 = \frac{I'}{P_n}, \qquad T_2 = \frac{I}{P_n + A + P}$$

Where I = total investment
I' = total investment less borrowed capital
A = depreciation
P = interest on loan
$P_n$ = gross profit

The pay-out period is the same for both capacities and is: $T_1$ = 3.7 years, $T_2$ = 3.8 years.

To compare the cost of a single brick, we can compare the price CIF of the imported goods which was in 1964-1968 as follows in US$ per ton:

| | 1964 | 1965 | 1966 | 1967 | 1968 | Average |
|---|---|---|---|---|---|---|
| price per ton of bricks | 20.61 | 18.39 | 20.27 | 21.54 | 23.98 | 21.4 |
| price per ton of tiles | 27.10 | 54.76 | 45.60 | 58.68 | 100.1 | 46.4 |
| average price of red products | 21.82 | 19.80 | 21.40 | 22.26 | 25.60 | 22.54 |

In Tunisia, the prices of first class products in 1967 were:

| | Dimension cms | Unit weight Kg | Price per ton $/t |
|---|---|---|---|
| Hollow bricks | 4.5 x 10 5 x 21.5 | 1.00 ) | |
| | 6.5 x 10 5 x 21.5 | 1.40 ) | |
| | 10.5 x 21 5 x 30.0 | 4.50 ) | |
| | 10.5 x 21.5 x 30.0 | 4.90 ) | 15.7 |
| | 15.0 x 20.0 x 30.0 | 6.70 ) | |
| | 15.0 x 20.0 x 15.0 | 3.25 ) | |
| Facing bricks solid | 4.5 x 10.5 x 21.5 | 2.00 | 52.4 |
| | 6.5 x 10.5 x 21.5 | 3.00 | 48.0 |
| perf | 4.5 x 10.5 x 21.5 | 2.00 | 31.5 |
| | 6.5 x 10.5 x 21.5 | 3.00 | 25.4 |
| Solid bricks | 6.5 x 10.5 x 21.5 | 3.00 | 43.2 |
| Hollow partition | 4.5 x 21.5 x 30.0 | 2.60 | 17.6 |
| | 6.5 x 21.5 x 30.0 | 3.60 | 15.7 |
| Brick Triplisol | 15 x 22 x 30 | 7.80 | 16.1 |
| | 15 x 22 x 22 | 5.80 | 20.7 |
| | 15 x 22 x 15 | 3.90 | 21.4 |
| | 15 x 22 x 7.5 | 2.00 | 23.1 |
| Hollow clay lots for roofing "Roger" | 13 x 33 x 30 | 7.00 | 16.4 |
| | 16 x 33 x 30 | 7.50 | 17.8 |
| | 19 x 33 x 30 | 8.00 | 18.9 |
| | 30 x 33 x 30 | 12.80 | 19.3 |
| -"- "Brilaxfer" | 11 x 20 x 30 | 4.00 | 18.0 |
| | 13 x 20 x 30 | 5.00 | 18.2 |
| | 15 x 20 x 30 | 5.00 | 18.8 |
| -"- "Sap" | 12 x 20 x 20 | 2.70 | 20.6 |
| | 12 x 20 x 30 | 4.00 | 19.8 |
| | 16 x 20 x 20 | 3.50 | 21.1 |
| | 16 x 20 x 30 | 5.00 | 21.1 |
| | 20 x 20 x 20 | 4.00 | 23.1 |
| | 20 x 20 x 30 | 6.00 | 22.0 |

The comparison of these prices with the respective prices of 14.3 and 14.3, and 13.0$ per ton of the average production of the proposed brickworks shows, that the brickworks are viables and that there are possibilities of taxes and charges of 25-35 per cent on the production costs.

## Estimation of the profit for National Economy

| | | in US$ 1000 | |
|---|---|---|---|
| | | . | 2x 80,000 |
| Production in tons per year | 80,000 | 140,000 | +1x140,000 |
| Value added | 755.7 | 1,191.5 | 2,702.9 |
| Intermediate inputs | 380.8 | 649.4 | 1,411.0 |
| Gross turnover (pre-tax) | 1,136.5 | 1,840.9 | 4,113.9 |
| Value added as percentage of gross turnover | 66.5 | 64.7 | 65.7 |
| Value added as percentage of total investment | 34.4 | 33.1 | 33.8 |
| Value added per person employed, $ per pers. | 4,723 | 4,965 | 4,827 |

## Foreign currency saving

| | | | in US$ 1000 |
|---|---|---|---|
| A) Red clay products entirely imported | | | 2x 80,000 |
| Production in tons per year | 80,000 | 140,000 | +1x140,000 |
| Price of goods (22.5 $ per ton) | 1,800 | 3,150 | 6,750 |
| B) Red clay products locally produced in Libya | | | |
| Spare parts | 30 | 48 | 108 |
| Depreciation (55% foreign investment) | 108 | 178 | 394 |
| Profit (55% foreign investment) | 182 | 297 | 661 |
| Total | 320 | 523 | 1,163 |
| Foreign currency saving | 1,480 | 2,627 | 5,587 |

Sources: ECA: Development of the brick Industry in North Africa E/CN.14/INR/.P/5, Febr. 1969.

ECA: The Construction industry in the Development Programmes of North Africa (1964-1980) E/CN.14/INR/163.

Industrial-Census, Tripoli 1965

Statistical Abstract 1966, Tripoli

UN Statistics

Annex I

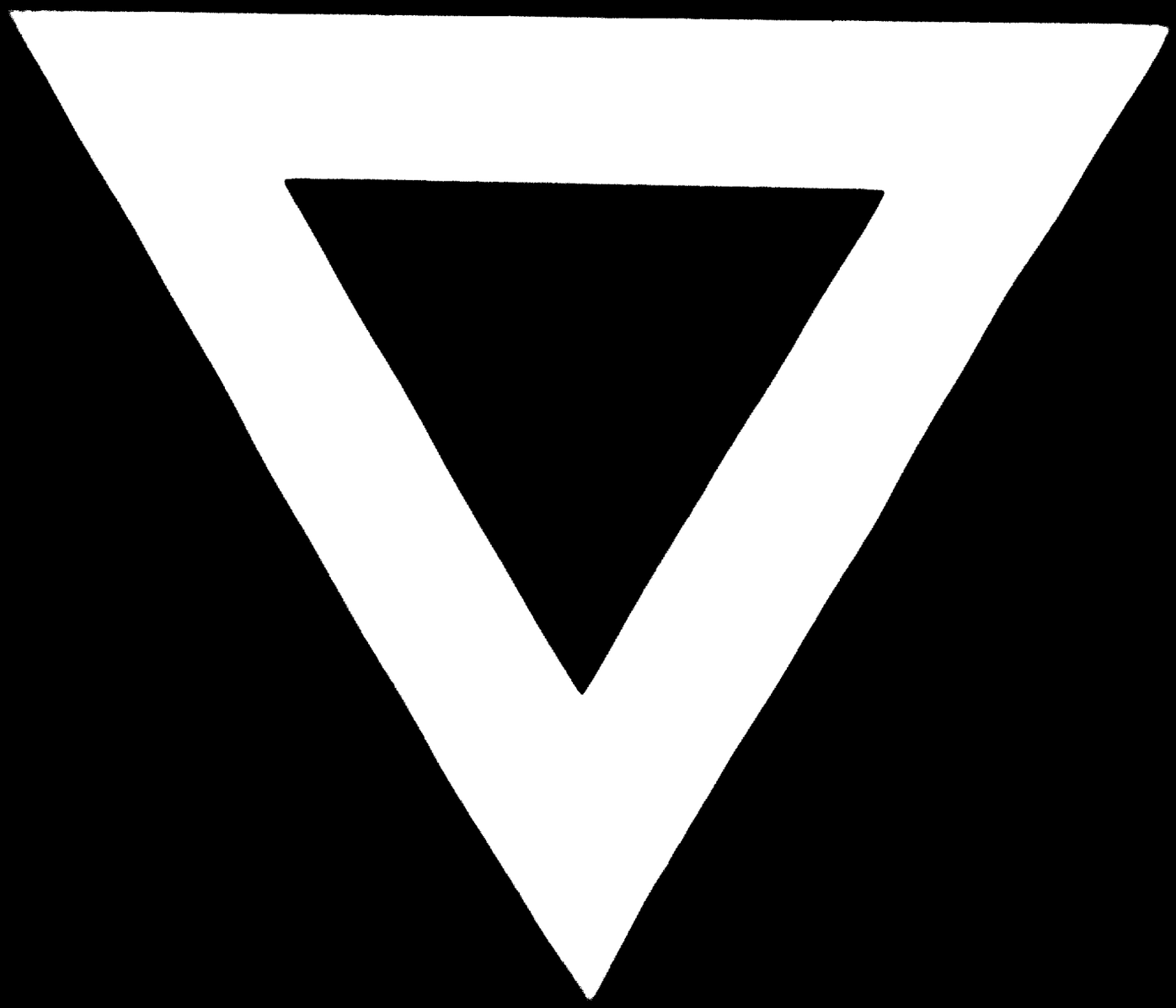
## Analysis of Production Costs exclusive of charges

in US$ 1000

| | | | | |
|---|---|---|---|---|
| Production | tons per year | 80,000 | 140,000 | 2x 80,000 +1x140.000 |
| Unit investment | $ per ton output | 27.5 | 26 | |
| Investment total | $1000 | 2,200.0 | 3,600.0 | 8,000.0 |
| of which: equipment | " | 1,200.0 | 2,000.0 | 4,400.0 |
| non-equipment | " | 1,000.0 | 1,600.0 | 3,600.0 |
| Depreciations: 13% of equip. | " | 156.0 | 260.0 | 572.0 |
| 4% of non-equip. | " | 40.0 | 64.0 | 144.0 |
| Total | " | 196.0 | 324.0 | 716.0 |
| Maintenance: 4.5% of equip. | " | 54.0 | 90.0 | 198.0 |
| 1.5% of non-equip. | " | 15.0 | 24.0 | 54.0 |
| Total | " | 69.0 | 114.0 | 252.0 |
| Borrowed: capital 45% of investment) | " | 990.0 | 1,620.0 | 3,600.0 |
| Interest: 6% of borrowed capital | " | 59.4 | 97.2 | 216.0 |
| Inventory | " | 120.0 | 200.0 | 440.0 |
| Interest: 10% of inventory | " | 12.0 | 20.0 | 44.0 |
| Insurance: miscellaneous 1% of capital | " | 22.0 | 36.0 | 80.0 |
| Fuel: 15.5¢ per ton | " | 74.4 | 130.2 | 279.0 |
| Electricity: 40$ per 1000 kWh | " | 102.4 | 179.2 | 384.0 |
| Water: 0.1$ per cu.m. | " | 8.0 | 14.0 | 30.0 |
| Employment total | No | 160 | 240 | 560.0 |
| of which: managerial staff | " | 2 | 2 | 6 |
| technical staff | " | 6 | 6 | 18 |
| foremen and overseers | " | 7 | 9 | 23 |
| employees | " | 7 | 7 | 21 |
| workers skilled | " | 63 | 102 | 288 |
| " semi-skilled | " | 42 | 67 | 151 |
| other staff | " | 33 | 47 | 113 |

Analysis of Production Costs exclusive of charges - continued

| | | | | | | |
|---|---|---|---|---|---|---|
| Yearly salaries and wages: | | | | | | |
| managerial staff | (-GA | 5,000$/year) | $ 1,000 | 10.0 | 10.0 | 30.0 |
| technical staff | (-TD | 3,600 " ) | " | 21.6 | 21.6 | 64.8 |
| foremen and overseers | (-TI | 2,500 " ) | " | 17.5 | 22.5 | 57.5 |
| employees | (-GA | 1,800 " ) | " | 12.6 | 12.6 | 37.8 |
| workers skilled | (-TD | 1,130 " ) | " | 71.2 | 115.3 | 257.7 |
| workers semi-skilled | (-TD | 1,050 " ) | " | 44.1 | 70.4 | 158.6 |
| other staff | (-TI | 850 " ) | " | 28.1 | 40.0 | 96.2 |
| Total | | | | 205.1 | 292.4 | 702.6 |
| Average salary per capita per year | | | $ per year | 1,282 | 1,218 | 1,255 |
| Social charges and holidays; 12% of sal. $1000 | | | | 24.6 | 35.1 | 84.3 |
| Raw materials; 0.8 $ per cu.m. | | | " | 33.6 | 58.8 | 126.0 |
| Net profit: 15% of investments | | | " | 330.0 | 540.0 | 1,200.0 |



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