



TOGETHER
for a sustainable future

OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.



TOGETHER
for a sustainable future

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as “developed”, “industrialized” and “developing” are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

We regret that some of the pages in the microfiche copy of this report may not be up to the proper legibility standards, even though the best possible copy was used for preparing the master fiche.



DE3380



United Nations Industrial Development Organization

Distr.
LIMITED

ID/WG.122/12
9 March 1972

ORIGINAL: ENGLISH

Meeting on Prefabrication in Africa
and the Middle East

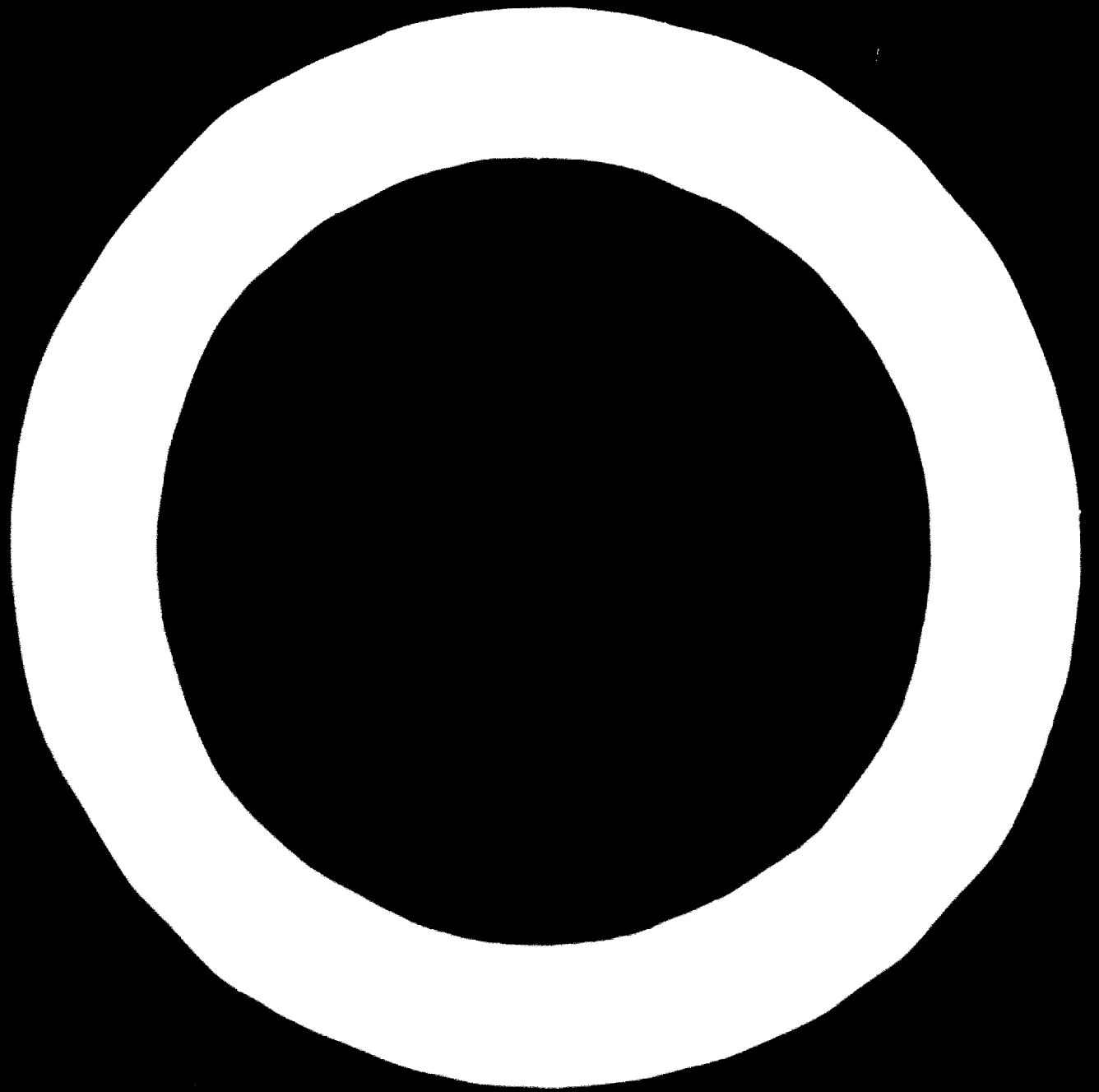
17 - 29 April 1972
Budapest, Hungary and Bucharest, Romania

THE ARAB REPUBLIC OF EGYPT
REPORT
NEEDS, POSSIBILITIES AND PROSPECTS ✓

by
Mohamed Fathy Eid
Chairman
Arab Bureau for Design and Technical Consultations
Cairo

✓ The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the Secretariat of UNIDO. This document has been reproduced without formal editing.

14.72-134



General Description

The Arab Republic of Egypt lies at the north-east corner of the African Continent, bordered at the north by the Mediterranean sea, at the east by the Red sea, at the west by the Arab Republic of Libya and at the south by the Republic of Sudan.

The Nile river passes through Egypt from south to north, at Cairo it divides to two branches, Damietta branch and Rashid branch; between the two branches lies the Nile Delta. The river ends its journey at the Mediterranean sea, along the two branches of the Nile lies a fertile narrow strip of agricultural land the fertile strips gets wider at the north to encompass the Delta.

East of the Nile near the Red sea is a chain of mountains of different geological nature, at the south are granite, marble quarries; further north are sand stone, basalt, limestone and gypsum. These quarries almost disappear at the Nile Delta, except for some quarries of a weak limestone at El-Max near Alexandria, and some other quarries of colourful sandstone near El-Issailiya and Suez in the Canal area.

Sand and aggregates exist in Egypt with enough quantities in all desert areas on both sides of the Nile Valley at the border of the agricultural strip.

The following table indicates the production of the different quarries in Egypt:

Quarry Production

Item	Unit	60/61	64/65	65/66	66/67	67/68	68/69
Granite	(000)Cu.M.	3	233	266	N.A	13	75
Basalt	(000)Cu.M.	320	430	474	N.A	336 ⁺	N.A
Alabaster	(000)Cu.M.	6	38	34	33	N.A	N.A
Lime Stone	Mill.Cu.M.	3	3	3	N.A	10	57
Sand common	Mill.Cu.M.	1	2	2	N.A.	3	4
Gravel	Mill.Cu.M.	1	2	2	N.A	N.A	N.A
Sand white	(000)Cu.M.	40	30	33	29	42	32
Clay	(000)Cu.M.	600	431	148	N.A	505 ⁺	928 ⁺
Gypsum	(000)Cu.M.	450	366	332	392	266	542
Pumice Stone	(000)tons		24	27	N.A	1	N.A.
Sand stone	(000)Cu.M.	00	16	256	N.A	55 ⁺	75 ⁺
Crystalline stone	(000)Tons	20	16	18	N.A	N.A	N.A
Asbestos	Tons	60	450	3506	1866	1937	2602

N.A - (not available)

(⁺) 000 tons

Building materials production:

Since the fifties, the State has paid enough attention for the industry of building materials, many industries have expanded and new building materials were added since then, still the products of some industries are not enough to cover the local market, the difference is being covered by imports from foreign nations.

It is noticeable that the products of some of these newly developed industries are not up to the standards, but

with training and experience it is hoped that it will reach the required international specifications. In the meantime some of these industries have reached a top level compared with production of other nations.

Most of the sites of the factories of building materials industries are located near Cairo or Alexandria, the State is planning now to disperse the new industries along the country.

The following table indicates the different industries of building materials and their production; (see Table p. 4).

Imports

The State is in charge of importing the building materials required for construction and is not available locally, or if the local production is not covering the local market.

The following are the amounts of the different building materials imported yearly:

Wood.....	400,000 m ³
Reinforcing steel.....	120,000 tons
Steel sections (crital).....	75,000 tons

After the completion of the steel mills in the next few years, the country will be self sufficient with the steel production produced locally.

Building plans and activities:

The average investment spent per year in construction is 230 million Egyptian pounds. This includes construction of public, industrial, educational, cultural building, ..etc. The State is financing the costs of these constructions in general.

Industrial Production

Item	Unit	60/61	64/65	65/66	66/67	67/68	68/69	69/70
Steel Sec.	(000)Tons	31	88	99	80	106	135	126
" sheets	" "	29	31	36	39	42	45	43
C.I.pro- ducts	" "	46	42	46	36	45	50	51
Rainfer. steel	" "	160	174	171	165	193	205	212
Naif	" "	8	16	12	12	7	7	6
Wire Cable	" "	7	10	9	9	9	9	12
Copper Products	" "	7	10	9	8	5	7	8
Lead "	" "	3	3	4	4	4	5	8
Pipes	Tons	4620	5200	6222	5325	3659	2172	2100
Plastic products	(000)LE	622	5029	5140	6250	5669	7468	8524
Glass sheets	(000)Tons	12	23	20	19	22	22	19
Port land cement	(000)Tons	1838	1754	1850	1746	2120	2394	2397
White cement	(000)Tons	13	40	40	39	43	46	41
Ferro "	" "	216	615	652	1130	636	1046	2062
Cable	Tons	1493	4098	3693	2984	2724	123	1275
Services	Tons	1676	2625	2794	4425	2466	3870	2701
Sanitary appliances	Tons	254	6181	6467	7893	7604	9347	11623
Refractory bricks	(000)Tons	44	74	74	96	48	95	98
Clay pipes	" "	29	23	24	29	16	20	20
Concrete "	(000) "	24	126	179	217	224	36	24
Asbestos sheets pipes	" "	45	51	52	59	25	51	55
Red bricks	Mill.	220	1115	915	815	619	690	723
Sand "	"	10	22	23	21	15	12	12
Tile	" Sq.M.	2	2	3	2	2	1	2
Gypsum	(000)Tons	152	192	275	308	354	275	251

Housing plans:

Population of Egypt is 35 million people, 15 million lives in urbanized areas and 20 million in the country side.

The average size of the Egyptian family is 5 persons per family and the rate of increase of the population is 2.5% per year, that is to say 875,000 persons per year.

The rate of migration from farm lands to urban areas is 1% per year.

The percentage of newly wed is 1% per year.

The urban areas are suffering from over population and lack of proper housing and public services. The population of the farm land and country side are suffering from the un-human conditions of housing and the disappearance of public services in most cases.

A five-year plan for improving housing conditions in rural and urban areas is being under study now by the State.

The State is financing one third of the cost of low income housing in urban areas, all housing above this level is being sponsored by the private sector of the economy and the co-operative organizations.

Rural housing in the newly developed lands is being financed by the State, expansion in old villages has been done by individuals.

The following tables No. 3 and 4 represent the investments in housing in urban and rural areas respectively.

Investment in urban areas

Kind of housing	60/61	64/65	65/66	66/67	67/68	68/69	%
Economic building	7507	11924	24082	18244	29274	17906	64%
Mid-average standard "	5195	5036	8477	6788	9727	8913	32%
Popular "	1456	953	950	550	1471	1190	4%
Total	14158	17913	33509	25582	40472	28009	100%

The average cost of the housing unit is 1,000 Egyptian pounds.

This investment covers only a small portion of the housing needs.

Investment in rural areas

Kind of housing	60/61	64/65	65/66	66/67	67/68	68/69
In the old rural areas	-	1769	7781	23000	3646	5234
In the modern rural areas	385	6132	7082	7400	4665	1445
Total	385	7899	14863	30400	8311	6679

The average cost of the housing unit is 500 Egyptian pounds.

Studies of urban renewal of the cities of the Suez Canal area are being developed to be ready for execution after the expulsion of the enemy from the occupied lands.

A new plan for renewing the village and the country side in 20 years, the new plan will include modern housing, public services like schools, clinics, pure water and electricity, the plan depends basically on self-aid of the inhabitants themselves, the state will provide building materials, technical experience and possibly factories for pre-cast elements.

The Budget allocated by the State for this project is 1,000 million Egyptian pounds for building 4 million housing units in rural areas.

Demand for Housing:

Urban areas: housing need in the year 1975 is being estimated as follows:

	<u>Units</u>
Shortage in housing units in 1960.....	298,000
For over crowding.....	103,000
For population increase between 1960 to 1975....	1,448,000
For dilapidated houses from 1960 to 1975.....	225,000
	<hr/>
Total.....	2,074,000
Subtracting number of units built from 1960 to 1970.....	300,000
	<hr/>
Net total.....	1,774,000
	<hr/>

This is the actual housing needs, but the demand is decided by the capability of the individuals to pay the rent or the price of the unit and the Government subsidies. It is also dependent on the availability of building materials in the general plan of the State.

Building Construction methods in Egypt:

Building construction methods are divided into two methods based on the majority of building in first rural areas second urban areas.

Rural area: The majority of houses for low income classes are one story and are wall bearing system, the walls are built by mud bricks, roofs from palm trees trunks or wood.

For higher income classes buildings are built by the wall bearing system also, walls are either burned clay bricks or stone. Roofs are reinforced concrete slabs. In some cases reinforced concrete skeleton is used, in such case partitions are burned clay bricks.

Urban areas: Buildings used for low income classes are usually three floors, bearing walls from burned clay bricks or stones and roofs are reinforced concrete slabs. For higher income group buildings are usually skeleton type and partitions built by burned clay bricks, or sand bricks. For public buildings the same system is used. This classic method goes along with the local building materials available, and the inherited skills by building construction workers.

This method was taken into consideration in the planning for housing and construction.

Development of Construction methods in the future and the use of pre-cast elements:

In the next few years the production of the steel mills will increase to cover the demand for steel needed in building construction. In such a case steel skeletons could be used,

especially in tall buildings, where the loads on the columns are big. It will be possible then to use these three methods for construction:

- Reinforced concrete skeleton
- Steel skeleton
- Skeleton system based on combining the use of reinforced concrete and steel sections.

The use of burned clay bricks in the building of partitions will be minimized after the building of the high rise, because the clay which is used in the making of bricks is blocked behind the canal and an alternate material for bricks has to be found. Primarily the industry of sand bricks has to expand. It is planned to expand sand brick factories in all the governorates of Egypt, but this will not be enough to cover the demand and new materials for partitions have to be developed. Pressed wood treated for fire protection, or blocks from agricultural waste like rice or cotton seeds, which are treated chemically, also light concrete blocks or hollow blocks could be used.

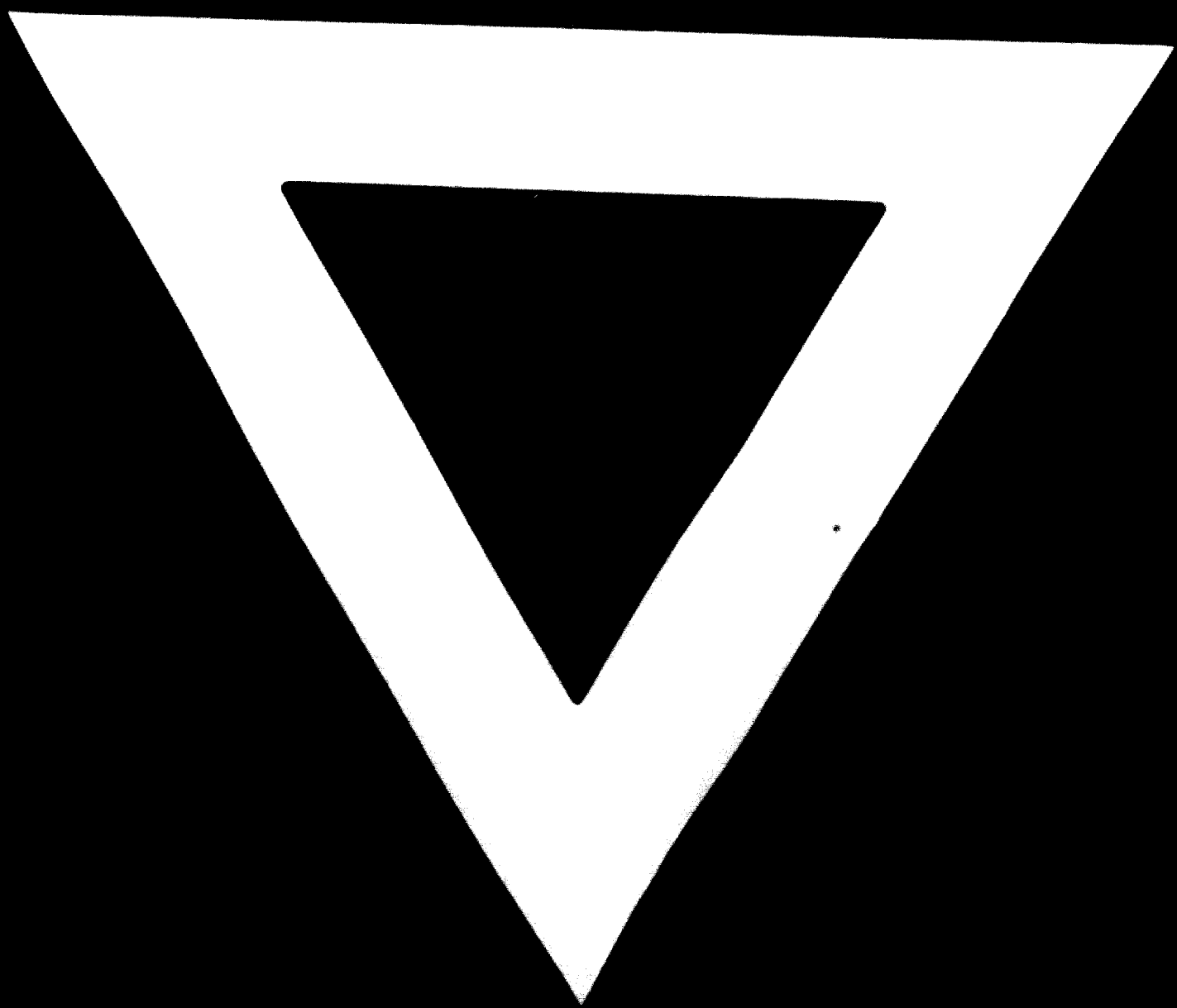
As for pre-cast elements Egypt has no past experience with the use of this method in building construction, but since the State is building very pre-type buildings especially in low income and middle income housing in rural and urban areas. The great programme that is hoped to be executed to reconstruct the rural areas, the New canal cities, slum clearance and urban renewal, and due to the expansion in the industries and the diversification of many building workers to other industries. It is necessary that we start thinking in the use of pre-fabricated elements in the building construction industry.

Studies are being conducted to evaluate the prospects
of precast concrete elements in the building industry. The
aim of this study is to find out in this study what

kind of precast concrete elements, transportation methods,
storage, etc., are necessary to use, plus the training
of technical staff and workers for this new system
of construction.

.....





19 . 6 . 74