

Ministry of Development
and State of Housing and
Land Reclamation.

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Community Planning & Development
Challenges.
Water , Energy , Environment

New Growth Outside
The Narrow Nile Valley
In Egypt.

1. Back Ground

1.1 Population of Egypt.

According to the formal statistical data published recently, the population of Egypt reached about 40.5 million persons on January 1979, 40% of which are urban. It is estimated that the total population would reach about 66.0 million persons by the year 2000, provided that prevailing conditions would continue the same. It should be noted that urban population increases at a rate higher than that of rural population due to migration from rural to urban.

Characteristics of migration are studied along the period 1966-1976. It was found that :

In all governorates, the actual increase in rural population is always less than the natural increase. The difference represents the amount of migration from rural to urban.

1.2 Physical Conditions in Egypt.

In fact, the population of Egypt lives in the Nile Valley which represents less than 4% of Egypt's total area. Most of cities in Egypt and nearly all the villages are surrounded by productive agricultural land. Therefore, any urban expansion thereof would be to great extent on the expense of agricultural land which represents one of the most important elements of

Egypt's production. In order to preserve agricultural land, it becomes inevitable to direct urban expansion toward the desert land in the form of new agglomerations. Such forms should be within the frame of National strategy for development. The distribution of population according to available and potential resources must be one of the main objectives, thus, minimizing the dependence on the narrow Valley for living. In fact the Government of Egypt has developed its National strategy based on these fundamentals.

1.3 Main Problems Facing Cities.

The problem of housing is one of the crucial problems facing cities in Egypt. It is estimated that about 3.6 million dwellings units have to be built during the period ending in the year 2000.

Not only the problem is confined to the number of housing units, but it extends to utilities, transportation, services and other basic facilities. Above all, is the provision of employment. It is estimated that one industrial employment requires a capital ranging from L.E. 10,000 to L.E. 20,000 according to the nature of industry. In addition, there are the requirements of housing plans concerning building materials, construction, equipment, manpower and finance. One of the main problems facing Egypt in this respect is how to eliminate the gap between the ability to pay

of beneficiaries of housing and the economic rents of the dwelling units according to the installment of the capital invested and its interest.

1.4 Main Problems Facing Rural Areas.

The actual increase of rural population in Egypt has reached about 3.4 million persons in the period 1966 - 1976, this population increase is equivalent to about 700,000 families requiring about 2 million feddans to be reclaimed. In fact, the Government could only reclaim about 1.5 million feddans in the period 1952 - 1980. This situation requires a comprehensive action considering :-

- a) Agricultural industry
- b) Handi crafts
- c) Vertical agricultural expansion
- d) Recycling of water
- e) New projects for food security
- f) New methods for inrrigation
- g) New era and new activities other than traditional ones.

1.5 National Strategy for Development.

Considering Egypt's problems in urban and rural areas stated above National strategy for development has been summarized in "October Working Paper ".

As President Sadat said in October Working Paper :

"We are now faced with the task of making the new map of Egypt a reality by defining and implementing a policy of new settlements in the desert area. Fortunately for Egypt, The growing technology of the last half of the twentieth century can provide us with the means to carry out such a policy and address the problems posed. In doing so, we can also develop a complementarity between solutions to the problems of older cities and the opportunities opened by the establishment of new communities in the desert."

II. Present & Past Experience.

In the following we shall discuss some of the Egypt undertaking in the past and at present.

2.1 The Master Plan of Greater Cairo Region.

The greater Cairo Planning Commission was created in 1965 to develop a master plan for Greater Cairo Region. The Plan was completed in 1971. The Region covers the cities of Cairo, Giza, and part of Kalyobia and Giza Governorates.

Its population was estimated between 14 & 17 million persons in 1990 based on certain assumptions for migration. The plan recommend that 4 new satellites be created to cope with 4 million persons. Rural areas in the Region which account for

210 thousand feddans can cope with about 1.3 million persons and the built up area of the plan was assumed to cope with the rest. One of the four satellites is El-Obour City, the second is the city of October 6, the third is El-Amal City all of which will be discussed later, the fourth is 15th of May.

2.2 The Creation of Ministry of Development & New Communities.

In 1974, Ministry of Development & New Communities was created. It became responsible for the development of urban growth poles in :

Suez Canal Region

North Coast

Red Sea & Sinai

Western Desert

High Dam Lake

Major Developments

Utilities of Cairo & Alexandria

The Ministry is responsible for the development of a National strategy and urban land policies. In this frame of responsibilities it carried out the planning and construction of a number of new towns. A brief of some of these new towns will be presented in the following.

2.3 10th of Ramadan City.

The creation of the 10th of Ramadan City is the starting action for implementing the National Strategy for urban growth. The city is located 55 kms from the center of Cairo on Cairo - Ismailia highway. It covers 13,400 feddans. Its ultimate population in the year 2000 is 500,000 persons. The first stage of development copes for 150,000 population with their requirements of residence, industry, services and utilities. The character of the city is industrial with the sector of industry leading.

2.4 The Sadat City.

It has also been provided for as a response to National strategy for urbanization and is located on Cairo - Alexandria desert Highway, 65 Kilometers North of Cairo which is far enough to discourage commuting. Its area is about 48 Kms². The target population in the year 2000 is half a million to expand to one million after that. The plan is based upon heavy industry including a possible iron and steel complex. It is proposed to be financed through the public sector initially, especially industrial development, while it is planned to attract Egyptian and foreign private investments. The city is planned as a self contained city with full services and utilities.

The driving force behind anticipated growth is a wide spectrum of heavy, medium and light industries.

2.5 15th of May City.

The basic function of this city is to provide housing and amenities to the labourforce working in Helwan area and commuting every day to their homes in different parts of Cairo Region . The City lies at the south of Helwan city. Its population is about 150,000 persons. The area devoted for the City is about 1500 feddans, about 50,000 dwelling units will be constructed in three stages, along with all necessary services and utilities required. It should be noted that the creation of 15th of May City is a part of solving the problems of Greater Cairo Region.

2.6 New Amiryia City.

New Amiryia City is located at a distance of 60 kms from the center of Alexandria towards the west. The city is planned to accommodate Half a million persons by the year 2000. The area of the city is about 48 kms². The first stage includes the development of an area necessary for about 150,000 persons, with the services and utilities required. However the city can grow to accommodate about one million persons after the year 2000.

2.7 El Obour City.

The city is a part of the Regional Plan of Greater Cairo, It will be constructed on 3000 feddans in the desert area near El Khanka. In fact, the main objective of the development of this city is to provide housing for the industrial complex at Abou Zabal and Khanka. It is being planned for about 250,000 persons.

2.8 6th of October City.

The creation of this city is a part of Greater Cairo Plan. It lies nearly on Oasis road at kilo 32. It covers about 14000 feddans and would accommodate about 350,000 population. It is planned to be a clean city. Industries that will be permitted will be non polluting industries. A large area is devoted for local and National and International tourism. The work has started in the first stages of development.

2.9 Suez.

The plan of the city was prepared according to Regional strategy of the area covering Port Said, Ismailia and Suez Governorates. A regional plan for the area was prepared at the same time feeding each other.

The principal base in the Suez Plan foreconomic expansions and population growth is a new city of nearly one million including existing urban centers of Suez and Port Tewfik. To achave this level of population by the year 2000 means an average annual increase of about 34000 persons which requires about 14,500 Jobs and the construction of 8,000 develling units each year. Accordingly, the existing urban area of Suez will have to be expanded from 11 kms² to 88 kms².

2.10 Port Said City.

The city of Port Said lies at the place where the Suez Canal meets the medi terranean. In 1975 a master plan for the city was prepared as a means for implementing the Regional strategy of the area. New development of Port Said was based upon the growth of its industrial and agricultmal sectors and the improvement and development of its port facilities. There is also a major arppportunity to befit and utilize the potential of lake Manzala for agriculture and fishing. It should be noted that due to the citys peculiar location, the land required for urban development has to be reclaimed from the lake. Total population is estamatied by three quarters of a million in the year 2000. During the preparation of the plan, the Government hasdecreed the city of Port Said and its territories to be a free zone and a free city.

Having discussed some of Egypt's undertakings with respect to new development it should be noted that what we stated here are examples representing a small portion of the efforts exerted by the Ministry in this respect. Some of the new towns and projects are being undertaken at present. In the following the problems facing Egypt with respect to water, Energy and environment will be discussed.

3. Water Problems in Egypt & Solutions Recommended.

3.1 General.

"Egypt is the gift of the Nile," is a very true fact. About 99% of the population of Egypt live in the Nile valley and in the main canal areas supplied by water from the River Nile. About 1% only of the population live in the frontier governorates and can not have access to the Nile Water except by long transmission lines and pump stations.

Ground water in the Nile Valley area is also available in different quantities and qualities.

Ground water in the frontier governorates is very restricted especially in the Eastern Desert and Senai, and there is generally little rainfall.

This represents, outside the Nile Valley, a water resource problem which is to be considered and solved for developing

these areas and creating new towns.

Potable water sources can be divided into three categories

- I Surface water sources.
- II Ground water sources.
- III Saline water sources.

3.2 Surface Water Sources.

- * The River Nile, its two Delta branches, and the associated main canals form the surface water sources feeding the water supply treatment plants.
- * These filtration plants serve, mainly, Greater Cairo, Alexandria, Suez Canal Cities (Port Said, Ismailia, and Suez), North Delta area (Behera, Kafr El Sheigh, Dekahlia, Damietta, Sharkia) and Fayum Governorates and almost all the big towns in the Valley.
- * Moreover, filtered water is transmitted through pipelines and pumpstations from the River Nile at Quena across the Eastern Desert to the Red Sea at Safaga, and extending along the coast to feed Ghardaga at the north, and planned to feed kouseir at the south. Also filtered water is transmitted from Nubaria Canal near Alexandria, along the Mediterranean coast westwards to Marsi Matruh city feeding all the settlements on the way up to and including Marsi Matruh.

The quality of surface water along the River and Canals reflects the Nile River water quality leaving Lake Nasser et Aswan.

Existing surface water quality is generally good however, irrigation return flows, discharges from industrial plants and river traffic have degrading effect on the water quality. Sediment entrapment in High Dam Lake has reduced sediment turbidity of Nile waters, but the greater clarity combined with adequate nutrients has increased algae growth.

The quality of water will decline due to increasing agricultural return flows. Dissolved solids can be expected to increase, while suspended solids will be primarily algae and organic material accumulated in the River below Aswan. Continuous monitoring of water quality at a number of locations along the River Nile is being undertaken as part of the water quality study on the River Nile and Lake of the High Dam. The data available could eventually give a valuable indication of the existing and potential future risk of contamination of surface waters by man made pollutants.

- * Based on the review of sources of pollution of the Nile waters and the results of the current related studies, maximum attention is to be given to minimise degradation of the Nile and Canal waters due to man-made pollutants.

On the other hand, existing water supply filtration plants are to be reviewed and modified, and the new plants are

to be designed to meet the requirements of treating waters with the new and projected qualities.

- * In conclusion, as regards surface water sources, water is always available in adequate quantities for potable supply (after treatment) throughout the length of the River Nile and at any point along the main canals.

3.3 Ground Water Resources.

The rapid expansion of the National economy in Egypt has necessitated a great development of water supplies to satisfy the demands of agriculture, municipal and industrial requirements. An auxiliary source of water exists in the ground reservoirs underlying the Nile Valley, the Delta and Coastal areas. It comes to be recognized that there is some water under the earth almost every where in the west desert. Proper development of the ground water reservoir is essential for the continued social and economic well being of the region. Ground water occurrences in the Sinai Peninsula are categorized in the North Coastal zones, southern coastal plains and wadis and artesian water reservoirs, zones north east Sinai. Ground water potentials at the Eastern desert are still under investigations.

Ground water is extensively used as city water supply in towns and villages in the Nile valley and Delta, about 20 million inhabitants use ground water for drinking purposes, as it is considered as an economical means compared to the river domestic water supply sources.

Proper studies of the ground water reservoirs give correct estimates of its safe yield. The continuous availability of the

ground water as a natural resource of fresh water depends on an understanding of its physical characteristics, water movement and safe utilization. In other words to know the new hydrological conditions specially after the construction of the Aswan High Dam, new cultivated areas, and changing the irrigation and drainage system. Also to study the equilibrium between fresh and salt water in order to determine the extent to which no salt intrusion reaches under the new conditions.

Ground water is being used in the western desert since the old kingdom (3200 B.C) and subsequent periods, as it is the only source. The oases as well as the coast, have always been a link for the Nile Valley and neighbouring countries. The ground water is confined to the Nubian Type sand stone which is part of the largest ground water reservoir in the world extending to Lybia, Chad and Sudan, the governing factor for utilizing the ground water in this case will depend mainly on its economic exploration cost and the Energy cost.

Towards the desert fringe of the Nile Delta two new cities are now being developed namely 10th of Ramadan and Sadat City. They can be considered as an actual example or a case study showing how the ground water source could be an economic and dependable source specially in the early stages of development. Whithin less than one year investigations and exploration

skemes for ground water were implemented in order to supply the Tenth of Ramadan City with fresh and continuous supply of water. For the next stages of development Nile water will be supplied from a distance of 20 km. The period for construction of pipe line, pumping stations and treatment plants needs at least from 3 to four years.

3.4 Saline Water Sources.

- * Where surface water or suitable ground water are not available as a source for providing potable water at a convenient cost, the alternative may be the saline water sources.
- * Sources of Saline Water :
 - I Sea water along the coasts of the Medeterranian Sea and the Red Sea.
 - II Brackish water in the coastal area and in some pocets in land.
- * Systems used in production of potable water from saline water are :
 - I Multistage flash distillation
 - II Electro dialyses
 - III Reverce Osmosis
 - IV Solar Energy Distillation
- * Construction costs, operation and maintenace costs, and the required level of operators skill should be considered

in comparison with schemes for alternative sources, before proceeding with desalting works.

- * The use of desalting works in Egypt is presently limited to very few units of multistage flash distillation and electro dialysis system.

However, the sun energy distillation may prove to be the most convenient solution for supplying some far isolated settlements on the Red Sea and Mediterranean, coast with potable water.

3.5 The Water Supply Policy.

The National policy is based on giving high priority to water supply utilities, being effective and essential in promoting the standard of living in existing communities and in creating new communities. The water supply policy aims to furnish all residents everywhere in the country, in large cities, towns, villages and settlements whether in the Nile Valley or along the Mediterranean and Red Sea coasts, or deep in the Western Desert, the Eastern Desert, or in Sinai. This is applicable to all existing communities as well as to the new communities.

This aim is planned to be attained through careful study and investigation of the existing water supply systems and defining works required for rehabilitation, upgrading or extensions