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# Manpower Planning in Egypt:
# Techniques and Major results

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## 1. INTRODUCTION:

### 1.1. The Role of Manpower Planning

Labor force occupies a central role in the prodcutive process. Land and capital are, of course, essential for production, yet it is the human factor that gives them such essential value. Hence, manpower development is a major target in the overall socio-economic development.

The major question in manpower planning is: what can be done to increase the productive capacipty of the labor force? Under this general question many other detailed ones may be asked. For instance, what are the objectives in terms of labor force size and its rate of growth? In what way these objectives be achieved? What are the desired changes in labor force structure? To what extent does the policy intend to increase the degree of manpower utilization through reducing unemployment and underemployment? What are the factors affecting labor productivity, and the actions to be taken to increase its level? What are the measures to be implemented on a short-run basis as against those of a long-run nature and in what way, if any, are the two types of measures interrelated? Is the general objective of policy to match the supply of labor force to its potential demand, or to match demand for labor force to its potential supply? What are the possible effects of the measures of labor force policy on other variables related to overall socio-economic development?

The answers to these and other related questions will always emphasize the fact that labor force is a central variable influencing and being influenced by innumerable and interrelated variables in the matrix of socio-economic life. Thus, manpower planning should be viewed as an important integral part in the total process of socio - eocnomic development.

## 1.2 The Egyptian Labor Force - A genral Background:

The Egyptian labor force more than doubled within a 53-year period. It grew from about 3.5 million workers in 1907 up to 7.8 million in 1960 with an average rate of growth of about 1.5 percent per year. The contribution of population growth to the changing size of the labor force overshadowed that attributable to the change in socio-economic factors reflected by the rate of participation in economic activities. In fact the latter had a negative effect during the most recent decades.

The proportion of the total population in the labor force has been relatively low, implying a heavy load of dependency. A primary factor in this regard is the youthfulness of the age structure of the population resulting from the high level of fertility.

In addition to the youthful age structure of the population, the low level of the female activity rate makes for a low crude activity rate in the population as a whole. The low female activity rate is due, among other things, to the classical social norms still prevailing in the country. By and large, the principal role of women is considered to be in domestic work at home; a norm which to a varying degree prevailed also in some of the present-day developed countries less than a century ago. Thus, any future improvement in such extremely unfavorable dependency ratio depends on a significant decline in fertility level or an appreciable increase in the female participation rate.

The Egyptian economic structure has been dominated by the agricultural sector. From the turn of this century until 1937 roughly seven out of each ten workers were employed in agriculture, with the exception of an apparent premature decline in the share of agriculture in 1917 due to the conditions of the first World War.

The shift away from agriculture dates back to the late 1930's. The deterioration of the country's terms of trade during the great depression;

the protectionist foreign trade policy after the regaining of fiscal autonomy; the lack of imports and accelerated urban growth during the second World War; and, perhaphs, the concern over the consequences of rapid population growth led to further governmental as well as pioneering private efforts which laid the foundation for economic transformation.

The decline in the percent share of agriculture during the 1937-1960 period was accompanied by increasing shares of both the secondary and terriary sectors, with a leading edge in the rate of increase for the former during the 1947 - 1960 intercensal period. Moreover, the reallocation of economically active population between the broad sectors of the economy was accompanied by significant shifts between the major industries within each sector, as well as shifts between various lines of activities within each major industry. By and large, manpower tended to shift from less productive to more productive industries and lines of activity. Along with these industrial changes, the occupational structure showed a definite trend of increasing proportions of occupations with higher levels of skill and education. Moreover, the 1937-1960 period witnessed modernization in the organizational framework of the economy as reflected in the changing distribution of the labor force by employment status, in varying degrees between different industries. With all these developments, the average productivity of labor increased significantly.

Despite the a forementioned developments, the traditional sector of the economy still employs a sizable portion of the labor force; the proportion of skilled, well-educated workers is relatively small, while family-type interprises and relatively inefficient organization predominate.

The regional picture of labor force exhibits distinctive patterns. A pronounced disparity exists between urban and non-urban governorates. Beside appreciably lower activity rates, urban governorates have more than the lion's share in the non-agricultural sector, in highly skilled workers, and in enterprises organized along modern lines. Among non-urban governorates, those in lower Egypt show somewhat higher proportion of the labor

force in non-agricultural activities and a more favorable occupational structure than those in Upper Egypt do. These differences, however, are small; and they become even smaller when a few exceptional governorates are excluded. Moreover, structural shifts in recent decades have occurred, by and large, on a nearly proportionate basis so that the extent of dissimilarity among governorates in 1960 was not very different from that of 1937.

A sound long-run policy in this regard should aim at decreasing regional dissimilarity in economic conditions. Such a policy not only satisfies the right of the inhabitants of the non-urban governorates to enjoy the fruits of socio-economic development, but also alleviates the increasing problems of housing, transportation, etc. in the major urban centers especially in Cairo and Alexandria.

In short, avoiding undue waste of manpower, alleviating the high dependency ratio, speeding the process of economic transformation in the face of the rapidly increasing man/land ratio, and reducing the regional disparities require a carefully worked-out manpower policy, well coordinated with overall socio-economic development program.(1)

### 1.3 Efforts in Manpower Planning in Egypt:

Aside from the modest effort connected with the first five-year plan (1960-1965), the principle work in the field of manpower planning in Egypt started in the Institute of National Planning at Cairo (INPC). Realizing the need for investigating various problems of manpower planning, the INPC formed a Research Committee in 1962 for this purpose. The work of the Committee is carried out in successive rounds, three of which have been completed and the fourth is still in progress.

The purpose of this paper is to review this work with some emphasis on the techniques used and the difficulties faced in their application. Major results are given in Appendix A.

## 2. THE FIRST TWO ROUNDS:

The Committee followed somewhat different approaches in various stages of the research project. The traditional demand-oriented approach was used in the first two rounds, where the objective was centered on estimating future manpower requirements and the needed changes in the educational and training system to meet such requirements. The steps involved are summarized below.

### 2.1 Economic Projections:

Value added for a relatively large number of sectors for 1959/1960 is given in the general frame of the first five-year plan. In addition, the frame specifies, in detail, the levels of production of different sectors for the year 1964/65; but for 1969/70 less detailed figures are included. Thus, more detailed figures for 1969/70 were estimated by applying the pattern of development of production in individual sectors during the 1959/60-1964/65 period to the somewhat aggregated plan figures for 1969/70.

Estimates for the period 1970-1985 were based on maintaining the target of doubling national income every ten years; a target which is implied in the figures for the 1960-70 period. A relatively simple and rough method was used for estimating the value added by sectors for the years 1975, 1980 and 1985. The method used is essentially an application of a usual or normal growth pattern of growth, determined through international comparison of production structure, to the Egyptian data for 1969/70 year.

The method assumes that the level of output (in terms of value added) in a given sector is explained by two variables, namely the value of per capita income and population size. The equation used may be written as follows:

$$V_i = a_{0i} \; y^{a_{1i}} \; P^{a_{2i}} \quad \ldots\ldots\ldots\ldots (1)$$

where,

$i$ refers to a specific sector, and

$V$ = per capita value added

$y$ = per capita income

$P$ = total population.

When equation (1) for year $t$ is divided by that of the base year, we get

$$\left(\frac{V_t}{V_0}\right)_i = \left(\frac{y_t}{y_0}\right)^{a_{1i}} \left(\frac{P_t}{P_0}\right)^{a_{2i}} \quad \ldots\ldots\ldots (2)$$

This equation indicates that the rate of growth of value added per head depends on the growth rate of income per capita modified by an income elasticity of production ($a_{1i}$), and the rate of population growth, modified by a population-size elasticity of production ($a_{2i}$).

The rates of growth of value added per head for each sector were estimated for the period 1970-1985 on the basis of equation (2). The values of the parameters ($a_1$) and ($a_2$), for individual sectors, were taken from international cross-section analysis by least squares regression methods, with some modifications for few sectors. The third parameter ($a_0$) of equation (1) was eliminated because the interest was confined to growth rates, since the absolute level of production was given for the base year.

In addition to an annual rate of increase in the national income of 7.2 percent (implied in doubling the national income every 10 years), the rate of population growth was assumed to be 2.5 percent per year for the whole period 1960-1985. This implies an assumption of about 4.7 percent annual rate of increase in per capita income.

The five-year's rates of growth of value added were calculated through multiplying the per capita value added growth rates by the rate of population growth over the corresponding period. Thus, given the absolute figures for the base year and the anticipated growth rates, value added of each sector for future years was calculated (See Table 1).(2)

2.2 Estimates of Labor Productivity:

Although the rising trend of labour productivity is fairly a general phenomenon which accompanies the process of economic development, yet its rate of increase varies not only among different economic sectors but also differs for the same sector overtime. Therefore, estimates of future levels of labor productivity require a detailed study of the relevant factors.

Needless to say that it is quite different to list precisely a set of relevant factors and to determine exactly the nature of their effect on the level of labor productivity. Of such factors, however, one must recognize, for instance, technical progress, development in organisation, management and structure of production, and the qualitative improvements in the labor force. Under these broad and interrelated factors, numerous sub-factors could be mentioned. Unfortunately, data designed to investigate the effect of such factors on possible changes in labor productivity are laking in most countries. Thus, estimates of future levels of productivity may be made by other methods.

When data are available for several years, past trends may be extrapolated for future years. But the extrapolated figures should be qualified by reasonable judgements as to possible developments in each sector. International comparisons, or inter-firm comparisons within a given country are also very helpful in throwing light on potential changes in labor productivity. In such comparisons, the pattern of changes in labor productivity in a technologically advanced country (or firm) may be chosen as a model for possible changes in another country (or other firms in the same sector), taking the time dimension into account. A combination of these methods was used for estimating labor productivity in Egypt up to 1985.

The investigation of data from different sources on labor productivity, for a number of sectors, over past years showed some inconsistencies in some cases, whereas in other cases the figures in the first five-year plan make past trends unrealistically low as a basis for future estimates. It is worth-noting that a separate study was consulted for estimating productivity in the agricultural sector.

In addition, an international comparison was carried out on a sectorial basis, including countries whose levels of economic development and productivity at selected time periods may prevail in Egypt during the period of estimation (1960-1985). Thus, given the results of these investigations, and in view of the relative importance of each sector in the Egyptian economy in the process of economic development during the 1960-1985 period, conclusions were drawn about the future growth rates of labor productivity. The estimated rates for different sectors vary from 1.6 to 4.8 percent per annum. On the basis of the anticipated growth rates and the absolute figures for the base year, the levels of labor productivity were calculated for future years (See Table 2).(3)

2.3. Estimates of Manpower Requirements by Occupation:

Evidently, after projecting value added and labor productivity, estimates of total manpower requirements for each sector were computed by dividing the former by the latter (See Table 3). However, since the proper planning of manpower should take into account both the quantitative and qualitative aspects of labor supply and demand, the next step was the projection of labor requirements by occupation.

The starting point, in this regard, was the reconstruction of the distribution of labor force by occupation in the base year (1960), in such way as to serve the purpose of the study. In fact, the classification of labor force by occupation in 1960 census was inadequate for the objectives of the research in some respects, among which are the greater number of occupations than what was needed, and the wide differences of educational levels of persons within each occupational group.

Several attempts were made to select a simple and workable occupational classification. Definitions of each occupational category were adopted firstly on the basis of the nature of each occupation, and secondly after investigating the educational level of workers. Such classification includes the following categories:

- Managerial occupations (Managers)
- Higher technical and scientific occupations (High professionals)
- Middle technical and scientific occupations (Technicians)
- Clerical & similar occupations (Clerks)
- Skilled labor occupations (Skilled labor)
- Unskilled labor occupations (Unskilled labor)

Thus, after a number of adjustments the occupational structure in 1960 was reconstructed. (See Appendix B).

As regards future changes in the occupational pattern for each sector, use was made of both historical and cross-sectional international comparisons. This technique was supplemented by several studies on the occupational structure of some of the most technologically advanced enterprises in Egypt. The results obtained from both procedures constituted the basis for determining the potential changes in the relative occupational distribution for different economic sectors during the period of study. Therefore, the total required number of workers from each occupational category for the economy as a whole was simply computed by multiplying the projected relative occupational distributions by total employment requirements for each sector, and summing up the results for the same occupational categories in all sectors (See Table 4).

It goes without saying that other methods such as extrapolating past trends in the occupational distribution, or investigating the effects of possible technical development in each sector were not used because of lacking the necessary information.(4)

## 2.4. Estimates of Manpower Supply by Educational Level:

The future supply of labor force with a given educational level is a resultant of the number of persons in the labor force in the base year with such level, plus additions from new entrants or re-entrants to the labor force, minus separations from the labor force due to death, retirements or withdrawal for other reasons.

Let,

$S_{ri}$ = Supply of labor force of educational level i at year r

$A_{ri}$ = Additions to labor market of educational level i at year r

D = An overall death rate for the span of working age

R = An overall retirement rate for all voluntary and involuntary reasons.

Thus,

$$S_{ri} = S_{(r-1)i} + A_{ri} - (D+R)\ S_{(r-1)i} \quad \ldots\ldots (3)$$

Graduates from educational level i in a given year ($G_{ri}$) do not necessarily enter the labor market; some of them continue their education (or training) at higher levels, while others may stay at home particularly in the case of females. Therefore,

$$A_{ri} = G_{ri} \cdot W_{ri} \quad \ldots\ldots\ldots\ldots\ldots (4)$$

where $W_{ri}$ denotes educational specific activity rate, i.e. the ratio of graduates entering the labor market at educational level i and year r to the total number of graduates of the same level and at the same year. It is to be noted that equation (4) neglects the number of re-entrants to the labor force which is usually insignificant; at least this is the case in Egypt.

From equations (3) and (4), we get

$$S_{ri} = S_{(r-1)i} \cdot (1-D-R) + G_{ri} \cdot W_{ri} \quad \ldots\ldots (5)$$

Needless to say that if the age structure is significantly different for various educational levels of the existing labor force, D and R should be estimated separately for each educational level, whenever the required data are available.

Estimates of manpower supply by educational level in Egypt for the 1960-1985 were prepared along these lines. The number of graduates in future years were estimated on the basis of past trends and the policies adopted by the Ministries concerned. In addition, an annual rate of separation from the labor force due to all causes was estimated and applied to the existing numbers in the base year.(5)

2.5. Setting Up a Tentative Plan for Education:

When the educational contents of occupational categories are determined, the estimates of manpower requirements by occupation (Section 2.3) may be translated in educational terms. Similary, manpower supply by educational level (Section 2.4) could be given according to occupational categories. The imbalances (deficits or surpluses) between the supply and demand may, therefore, be derived in either educational or occupational terms.(6)

Estimates of potential manpower imbalances for Egypt show deficits of varying magnitudes between the targeted demand and the estimated supply in all occupational categories other than unskilled workers (Table 5).

Thus, the logical step was to set up a tentative plan for education in such a way as to achieve the matching of future manpower supply and demand taking into consideration the time lag in the implementation of such a plan as well as the factors affecting the number of graduates at every educational level such as those indicated in the preceding section.(7) It is worth noting that since the plan for education in this case is based only on manpower requirements, it is often referred to this procedure as the "manpower approach" of educational planning.