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Methodology for Manpower Planning in Egypt

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METHODOLOGY FOR MANPOWER
PLANNING IN EGYPT

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Employment Strategy Mission to Egypt 1980

PREFACE

This paper was written as a contribution to the Employment Strategy Mission to Egypt in Summer 1980. The mission was headed by Prof. B. Hansen and sponsored by the ILO, Geneva, Switzerland. The paper has six principal sectors.

- The current employment situation is reviewed rather briefly together with a short summary of some of the historical forces which shaped it.

- Present manpower planning efforts are discussed. Most efforts tend to concentrate on the supply situation. Demand projections face a number of difficulties - the role of the large Government and public sector, migrants and lack of data on most sectors. There is little integration of supply and demand to provide policy advice on education investment. Education planning poses a number of difficult problems because of the inherent time lags and the large uncertainties involved.

- A number of macro models are reviewed. They fall roughly into two categories, econometric simulation and Leontief type input-output based approaches. They were developed largely to answer specific policy issues.

- The EMM (GEM) model was used during the mission to simulate various policy alternatives,some modifications were introduced to the model during this period and a number of others proposed.

- The data situation is reviewed both at the general level and for addressing specific manpower policy issues. A modular system is proposed which would seek to rectify two of the biggest data problems at the moment - lack of up to date reliable data and the cost and effort of mounting large scale gathering and analysis operations.

- The report concludes with a number of recommendations for modelling and data problems.

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1. Review of Manpower Planning*

The employment situation in Egypt is summarized in Table 1.1 for the year 1979. A number of features are evident. The majority of the work force are employed in agriculture and social services (mostly government) sectors, 38.9% and 24.3% respectively. In addition there is a further 9% of workers employed in various public enterprises. This latter group are spread across most sectors. The large role of agriculture in employment goes far back in history while the significant place of government and public sector employment may be traced back to events since 1950.

In Table 1.1 one also observes sharp disparities in intersectoral average wage levels. Thus agriculture employs 38.9% of the workers but contributes only 26.2% of GDP. Here the average wage level is LE 141.2 in current 1979 prices. At the other extreme one finds the dynamic petroleum sector where average wage is estimated at LE 1314. While this sector employs only 0.2% of the workforce it contributes 14% to GDP.

2. Background to Current Situation

Much of the current situation may be explained by reviewing briefly the series of events flowing from the revolution in the early 1950s. This triggered a sharp rise in the demand for education. Often the quality of education suffered due to this rapid expansion while the structure of the educational system itself suffered from an imposed value system that paid little attention to the country's needs. Thus education during the 1950s period was characterized by

- surplus in graduates

- lowering of the average quality

- rapid expansion in general education and at the university levels in faculties such as commerce, arts and law which were the least difficult to expand.

The 1960s were characterized by large scale nationalization. The government now viewed it as part of its obligation to allocate the huge excess supply of graduates. It also was aware of the need to defuse any potentially difficult political situation. The allocation of the surplus was effected by assigning workers to government and public sectors. Inevitably this resulted in underemployment and mismatch of skills. However, it also produced a number of other effects. It induced psychological values in the minds of many, which led them to believe that somehow the government owed them jobs. This was also accompanied by

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*This section has benefitted from discussions with Dr. Mandouh Saleh and his staff, Ministry of Manpower.

Table 1.1. Current (1979) Employment Situation in Egypt.

	Number of Workers 10³	Average Wage LE-current	Percent of workers	Percent of GDP
Agriculture	4164	141	38.9	26.2
Mining	33	348	0.3	0.3
Petroleum	21	1624	0.2	14.0
Manufacturing	1314	489	12.3	14.5
Electricity	60	533	0.6	1.0
Construction	629	295	5.9	4.3
Total Commodity Sectors	6222	250	58.2	60.4
Transport, Communications	500	472	4.7	8.5
Trade, Finance	1152	365	10.8	10.9
Total Distribution Sectors	1658	398	15.5	19.3
Housing	155	125	1.4	1.6
Public Utilities	64	336	0.6	0.3
Social Services	2595	448	24.3	18.4
Total Service Sectors	2814	428	26.3	20.3
Grand Total	10694	320	100	100

Source: Ministry of Planning. Tables prepared for ILO Mission 1980.

rising expectations of the lower income classes who now viewed education as the key to a secure future. In turn this generated strong political pressures to increase technical, secondary, and university institutions. Very often this was done without adequate consideration of what actual needs would be for the country as a whole. Inevitably such policies placed enormous strains on government and public sector employment.

Some of this strain was modified in 1975-76 when university graduates were given two years and technical secondary graduates three years to seek employment on their own initiative. Since then the process has been roughly as follows. Government and public sectors needs were first met and then most of the surplus was allocated to governates for local government positions. The allocation of the surplus was done by taking account of the applicants' situation such as residence, and family. This humane element minimized any dislocation at the personal level and at the same time helped to reduce any further exacerbation

of growing urbanization problems in housing and services.

In the late 1970s the domestic economy began to expand rapidly and this was accompanied by strong demand for Egyptian workers overseas. The emmigration, to Arab countries in particular, expanded rapidly due to a number of factors which included similar language and cultural background. Also Egypt was able to provide, at least initially, a ready supply of the type of worker in demand. These included a high proportion of construction workers, teachers, doctors and engineers. Inevitably this soon resulted in shortages appearing in Egypt for certain occupations and skills.

3. Current Manpower Planning Situation

By 1979 and early 1980 the surplus in many occupations began to disappear. For instance in commerce and law there is now only a modest excess supply in place of the substantial surplus of only a few years earlier. The Ministry of Labor (through Dr. Mandouh Saleh) indicates that there are shortages for skilled secretaries, automotive trades and many of the construction sector skills while there is a surplus of graduates from agriculture schools.

Public sector companies were also squeezed by the rising competition from the domestic private and overseas labor markets. Recently through Law No. 48 the government abolished a number of constraints on them such as the imposition of unrequired workers. They were also enabled to offer more attractive terms of employment through various "indirect" wage payments in the form of better grade levels or bonuses. However in some instances these additions to nominal ("official") wage levels are not all directed towards reaching greater economic efficiency or improved performance. (see El Salmi (1980) for extensive discussion of these issues).

This role of government as an employer of last resort generated a number of other side effects. Requests from various government ministries do not always reflect real needs as might be assessed by some measures of economic efficiency. Since additional emloyees are financed by the General Government Budget there is always the possibility that some requests may be made purely to improve the standing or even political base of the leaders in certain government sectors.

Faced with this rather cloudy demand situation the planners at the Ministry of Manpower have an extremely difficult task in assessing both the short and long term domestic and overseas demand. The strong element of uncertainty particularly in the overseas market necessitates prudence in any modifications to the supply situation. Any significant change may induce an even worse mismatch over a 10 year planning horizon.

3.1. Analysis of Manpower Supply

The manpower planning unit tends to concentrate more on the supply situation. They make projections by occupation and age group. These three age groups are:

- those below 15 years - typically illiterate
- 15 to 20 years who can usually read and write
- 20 to 25 years the highly educated

The basic data source is the 1976 census. This data is meticulously adjusted by three variables:

- death rate by group (negative)
- retirement (negative)
- entries from CAPMAS data (positive)

From these computations estimates are obtained by occupation and age group for 1981 and also the envisaged expansion over the Five-Year-Plan period, 1980/81 to 1984/85.

3.2. Migrant Estimates

The ministry also provides estimates for some of the migrants by occupation. However it only handles those who make official requests for, or renewal of, exit permits. This constitutes only a small fraction (10% to 20%) of the migrants. However it provides reasonable coverage for those migrating from the large companies or the government and public sectors. These migrants are willing to go to the trouble of formalizing their migration procedure to ensure that their domestic job slots are kept open pending their return.

3.3. Variable Determining Supply

The principal factors which determine labor supply are:

- net population growth rate
- participation rates
- educational system

The population growth rate has been estimated around 2.3% with perhaps a slight fall to 2.2% (official plan figure) by 1980. This produces about one million new additions to the labor force each year. The government has a number of policies to try and reduce the population growth rate but given the experience in most countries it is unlikely to fall below 2% in the short term. (5 to 10 years)* Most of the population are Moslem which presents some issues about the participation rates of women. In recent years they have begun to participate in increasing numbers. If this trend continues it could induce some major changes requiring new policy initiatives.

The educational system in its broadest sense* determines the composition and quality of the labor supply. Thus over the period 1973-77 there have been aggregate surplus and shortage situations in most broad categories - Table 3.1. The reason for simultaneous surplus and shortage situations in these broad categories is the imbalance at the disaggregated skill and occupation levels. The mismatch of supply and demand suggests the possibility of tailoring supply to more specific demand needs. The situation for university graduates has been analyzed in the Sanyal (1979) report. They offer a number of suggestions for achieving better supply demand balance for university graduates. The current aim of the manpower planning unit in the Ministry of Labor is to develop policy options towards this goal. These options would involve significant modifications to the present educational system. However the development of such proposals which involve large time lags in many instances (5 to 10 years) is particularly hazardous because much of the demand pattern for many skills and occupations is imposed from abroad. This is essentially outside the control of the Government of Egypt.

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* There have been a few rather dramatic falls over relatively short periods in Taiwan, Korea and particularly China but this was accompanied by large scale commitment at all levels of government.

* including training centers at various ministries, apprenticeships schemes.

Table 3.1   Shortage and Surplus Estimates for Some Labor Categories (1973-77)

	Surplus	Shortage
Secondary, Technical	103.329	61.066
University	38.617	96.523

Source: Ministry of Labour, Dr. Mandouh Saleh, 1980.

3.4. Demand

A recent study on manpower projections (Chatanoff, 1979) emphasises some of these problems. The study provides some estimates for manpower demand but emphazises the limited amount of data available on migrants. It also highlights some of the problems involved in basing estimates on the Five-Year-Plan targets.

This uncertainty requires development of scenarios under a number of assumptions about the evolution of both domestic and overseas patterns. This could be handled by suitable models of the situation. There are a number of macro models for Egypt but currently their application to manpower planning is rather limited. Some of these models are now discussed.

4. Macro Models for Egypt

This section discusses some of the macro models designed specifically for Egypt. There is a plethora of models with general and country specific features which might be fruitfully adopted to analyse various features of the Egyptian economy. However there are various unique features associated with data and institutional issues in Egypt which pose problems for such adaptation. These issues and some of the related data problems are also discussed in subsequent sections.

4.1. SMEE 1 (El Issawy - El Shafee (1977))

This is a simulation model of the Egyptian economy developed at the Institute of National Planning with assistance from FAO and UNFPA. It focusses "on the interactions between population, employment and productivity with special emphasis on the agricultural sector in a multisectoral, longterm perspective study". It is in a sense a modified version of the MARTOS model (1974). Some of its features are:

- 11 production sectors including four in agriculture

- 9 policy variables including export targets, growth of household consumption and population policy

- exogenous variables include production function for agriculture and industry, net foreign revenue from aid, tourism, migrants remittances, ratio of industrial to non-agricultural labor force

- endogenous variables include number of births, consumption of all goods and services, educational capacity, employment, imports, investment population, total savings.

A simplified version (population assumed exogenous) was used for validation and then a series of policy experiments carried out. Based on these experiments, which are carefully qualified by the authors, a number of policy

implications were suggested. A significant rate of economic growth is implied if domestic consumption is curbed by population control, taxation and consumption rationalization. The implications are reinforced when these policies are combined with an industry oriented development strategy. Some of the simulation runs suggested that the growth of the Egyptian national income was limited by institutional factors such as the agrarian structure and the production relations in industry.

Finally the authors suggested where further work might be useful for (a) data, (b) model structure, (c) simulation "technology". Under structure the authors indicate that the model does not provide any guarantee of balance at the sectoral and subsectoral level, while they also point out some limitations of the handling of investment and employment functions.

This type of model represents a very substantial commitment of time and money - perhaps four or five man years of highly competent manpower excluding data collection and preparation.

4.2. A SAM for Egypt - Taylor (1979)

This model was used by Taylor to anlayze some aspects of the macro situation in Egypt in the mid-1970s. The Egyptian economy at that time was characterized by large external deficit due to food and intermediate imports together with a substantial internal government deficit. He constructed a 19 x 18 Social Accounting Matrix (SAM) for 1975. It has three sectors, rural, urban and food. Food was treated as a separate sector because of the relevant food subsidy policy issues. He then shows how the 1975 SAM may be updated to 1976. This in turn allows him to estimate the various components of GDP for that year together with real GDP growth and inflation rate. Taylor suggests that this type of exercise provides a "convenient basis for organizing incomplete and perhaps contradictory data to say something fast (1 or 2 man months) about what is going on in the economy".

4.3. Multisectoral Model of Growth with Basic Needs - Taylor (1978)

This is a long term growth model used to analyze the long term growth possibilities subject to satisfaction of basic needs. The framework is the Leontief dynamic input-output model in "closed" form.It is designed specifically to analyze requirements for basic needs. It has 12 commodity sectors and a thirteenth for uses and sources of foreign exchange. The model includes input-output, capital output coefficient, labor-output coefficient matrices together with a vector of current consumption levels to meet basic needs.

The conclusions derived from the model suggest, subject to a number of caveats, that maximum growth rate at which basic needs (alone without surplus) can be satisfied is 6.6%. The model also suggests that "a decline in population growth may substantially ease the difficulties of income redistribution necessary to satisfy basic needs. The model indicates that a "basic needs" growth path would require substantial reallocation of resources with marked shifts in production towards capital goods and those services and government sectors that support basic needs. Relative prices of capital goods would rise while the shadow price of foreign exchange would fall. This is because there is heavy emphasis in the model on growth and hence investment demand with no surplus consumption.Also basic needs baskets are not high in import content.

4.4. EMM (GEM) - Eckaus et al (1979)

The EMM (GEM) combines an enlarged and updated version of the SAM developed by Taylor (1979) with a general equilibrium model similar to that reported by McCarthy and Taylor (1980). The SAM for 1976 is 41 by 41 and has 13 sectors including 4 for agriculture. It has household consumption dissagregated to six income classes corresponding to three agriculture and three nonagriculture. Value added is also distributed by these 6 classes.

The general equilibrium model may be used for short term policy analysis. It has the following features:

-   exogenous variables include exports, investment, government consumption, migrant remittances
-   policy variables for quasi-static analysis include the exogenous variables, levels of subsidy for consumption and production import tariffs
-   endogenous variables include household consumption, income, expenditure by income class both nominal and real
-   constraints may be introduced for all factors of production, land, labor, capital either by sector or for any combination of sectors.

The model has a number of areas which might be improved:

-   price formation should allow for mandated prices for certain commodities and also for inflationary impact
-   it does not treat the issue of unemployment or underutilized capacity
-   there are no dynamics to reflect the role of capital formation and labor availability.

A number of policy runs reported in the ILO mission report include the following:

-   removal or sharp reduction in food subsidies
-   wage policy
-   price policy
-   changes in level of migrant remittances
-   reallocation of 200,000 soldiers to agriculture
-   government cut back on purchases with concomitant reduction in taxes
-   removal of import tariffs
-   estimating the implications of the 5 year plan

These runs provide some insight on the economic impact of these measures and in particular their distributional impact. The model is also used to approximate some 5 year plan scenarios. The scenarios are discussed in Section 4.

4.5. DRM - Dervis et al (1980)

The DRM model produced by a World Bank team is a medium term (up to 10 years) multisector projection model. It is designed "to analyze alternative mechanisms of domestic resource generation and the interaction between domestic and foreign resources in determining the pace and pattern of Egypt's growth." It generates consistent macroeconomic accounts and provides many details for the balance of payments, fiscal accounts and particularly the petroleum sector.

There are ten production sectors with a variety of production specifications. Growth is driven by capital accumulation (including gestation lags), labor and technical progress. Value-added prices are projected exogenously.

The petroleum sector is particularly elaborate as this is viewed as being a particulary important sector for medium term planning. It is characterized by a rapid growth rate and in 1980 contributed an estimated 20% to GDP.

The model is driven by investment. For each scenario three gaps are considered:

-   foreign exchange-closed by foreign financing
-   fiscal-closed by borrowing from the private sector
-   savings-adjusts to total investment

However the closing of these gaps may be done interactively by either modifying the investment package or adjusting some of the many exogenous policy variables placed at the discretion of the planners by the model.

The authors consider the model primarily as a tool to serve as a complement for good judgement and economic analysis.

This summary of models is not meant to be exhaustive but rather to give some indication of the type and scope of models for Egypt that are presently available.

5. Modification to EMM(GEM) Model

During the course of the ILO mission a number of modifications were carried out to the EMM model to enrich the policy runs. This was done in cooperation with staff at Development Research Center, Cairo University:

-   GDP deflator was added
-   Price indices were computed for each of the six income classes

    The printout for each policy run now includes
-   GDP deflator; real growth rate for GDP
-   price index, level and changes in real disposable income for each income class.

These modifications are particularly useful to highlight the real and distributional impact of policy changes. The results for one example are given in Table 5.1. Here the direct household subsidies were removed. In 1976 (base year used in the EMM-model) these amounted to 168 million Egyptian pounds. The table highlights the real distributional impact of a removal of subsidies. In particular the low income urban group suffers a major setback. The price deflation for this group rises by 6.3% while their real disposable income drop 9%. The reason for the difference is that the real disposable income contains a number of items not appearing in the price index. These are mainly savings and net transfer payments.

5.1. Approximations to 5 year Plan Scenarios

Two 5 year plan scenarios were considered. The model is basically a static model so the outcome of tests like this should be viewed with a healthy degree of scepticism.

-   Scenario 1 - close approximation to offical plan targets
-   Scenario 2 - less ambitious targets based primarily on recent sectoral trends in the economy

Scenario 1 is summarized in Table 5.2. The official plan targets, in 1980 prices, were first adjusted to 1980 levels. Then the growth rates for variables considered exogenous in the model were estimated for the 8 year period 1976 to 1984 The model base year is 1976 so this facilitate comparisons.

The most conservative growth rate envisaged is for government which is expected to grow by 44% over the 8 year period. Investment is projected to increase by a factor 2.26 while the imported component is expected to grow by a factor of 3.75.

Among exports the crude oil sectoral contribution is expected to grow by a factor of 13.43 while tourism is projected to grow by 7.63. Migrants remittances are estimated to grow by a factor of 3.81. Among imports, capital goods and consumer goods are projected to grow by 3.75 and 3.56 respectively. Population growth is expected to grow by 19% over the period to 1976 to 1984.

Some indication of just how optimistic these offical plan targets are may be seen from Table 5.3. If one assumes no labor productivity gains then the employment should increase by more than 100%. Even if one assumes that 50% of the increase in labor share is due to increased employment (the rest due to productivity gains) then there is an increase of 51% in employment over the 8 year period from 9.6 to 14.6 millions. Similarly one may make a rough estimate of capital needs. Assuming constant coefficients, net capital in use should increase by a factor of 2.28 over the period 1976 to 1984. If one assumes an annual depreciation rate of 2% and a capital output ratio of three then gross investment required is 33% of output.

If one assumes that one third of the growth will be achieved by technical progress then investment share required would be 28% of output. This would be a remarkable target to sustain over an eight year period, when compared with the record of most countries outside the CMEA block.

Scenario 2 is summarized in Table 5.4. This scenario roughly follows recent trends which were quite high. Here it is assumed that all sectors with the exception of agriculture and services continue to grow at the same rates as during the period 1975-78. For agriculture an annual growth rate of 2.5% is assumed while services are projected to grow at a rate equal to the population growth rate of 2.2%. For import and export levels figures similar to Scenario 1 are chosen. For this scenario projected employment estimates are given in Table 5.5. If one assumes all increases in labor share are attributed to increased employment levels then the domestic labor force increases by 60%. If one assumes, rather optimistically that only half of the increase in labor is due to employment then the labor force increases by 30%. This seems to be within the realm of possibilities.

The capital estimates for this scenario are somewhat less ambitious than in the official plan estimates. Thus if there is no productivity gain and again we assume capital output rates of three and annual depreciation rates of 2% gross investment share of output should be 24%. If technical progress accounts for one third of the growth then this figure would fall to around 19% which seems with the realm of possibility.

Table 5.1. Impact of Removing Household Subsidies.
(Values in Million Egyptian Pounds.)

Variable	Base Run (1976) (Actual Situation)	Remove Household Subsidies Change %	
GDP (real)	7129	6879	-3.5
Disposable Income (Nominal)			
Urban			
0-60	1036	1002	-3.3
60-90	1093	1057	-3.3
90-100	1235	1195	-3.2
Rural			
0-60	717	688	-4.0
60-90	519	498	-4.0
90-100	478	458	-4.2
Disposable Income (Real)			
Urban			
0-60	1036	942	-9.0
60-90	1093	1010	-7.6
90-100	1235	1163	-5.8
Rural			
0-60	717	674	-6.0
60-90	519	484	-6.7
90-100	478	443	-7.2
Price Deflator			
Urban			
0-60	100	106.3	
69-90	100	104.6	
90-100	100	102.7	
Rural			
0-60	100	102.1	
60-90	100	102.7	
90-100	100	103.2	

Source: Results based on output of EMM (GEM) Model at Cairo University - Development Research Center 1980.

Table 5.2. Official Five Year Plan Estimates - 10^6 Egyptian Pounds.
(Population: 1976 = 38.2 million, 1984 = 45.5 million.)

Scenario 1

	1976	1984 (1980 prices)	1984[1] (1976 prices)	1984/76 multiple (both in 1976 prices)
Conventional Government Trade	1900	3822	2730	1.44
Investment				
Government	1680	4275	3054	2.26
Private		1045	746	
Domestic	1198	2947	2105	1.76
Import	482	2533	1809	3.75
Exports				
Agr. & Trade Products	537	1381	986	1.84
Crude Oil & Products	149	2090	1493	13.43
Partners Share		711	508	
Tourism & Service	171	1827	1305	7.63
Migrants Remitt.[2]	310	1660	1180	3.81
Imports[3]				
Consumer Goods	341	1700	1214	3.56
Intermed.	1208	3092	2208	2.05
Services		380	271	
Capital Goods	482	2533	1809	3.75

Source: 1984 figures from General Frame for 5 year plan MOP

[1] assume 40% price change 1976-1980

[2] 1984 estimates based on World Bank figures

[3] 1976 figures include import tariff

Table 5.3. Estimates of Employment (Based on Official Plan Estimates).

	Gross output 10^6 Egyptian Pounds			Employment 10^3		
	1976	1984[1] at 1979/80 prices	1984[2] (1976 prices)	1975[5]	1984 no labor productivity gain	1984[7] 50% increase in labor productivity
Sector						
1.–4. Agriculture	2422	4628	3306	4068	5553	4800
5. Food Industry	1522	2884	2060			
6. Textiles	885	2451	1751	1228	2333	1780
7. Other Industry	1392	4769	3406			
8. Construction	636	2761	1972	480	1488	984
9. Crude oil & Gas	609	4537	3241	19	101	60
10. Trans., Comm. Suez	577	2363	1688	414	1211	812
11. 12. Services [6]	3260	11723	8374	3436	8826	6131
	11303	36116	25797	9646	19512	14579
Migrants	310	1660[3]	1180	472[4]	1800[2]	

[1] Based on General Framework 5 year plan 1980/81 – 1984/85.

[2] Discounted by 40%.

[3] World Bank estimate.

[4] Obtained by proportion to offical 1984 estimate.

[5] MOP table prepared for ILO mission.

[6] 1984 and 1976 classifications may not be exactly comparable.

[7] Assume 50% of gain in labor productivity.

Table 5.4. Estimates for 1984 Based on Recent (1975-78) Trends[1]

Scenario 2

Sector	1984/1976 real growth[2]	Annual Rate %
Agriculture	1.22	2.50
Manufacturing	1.57	5.80
Construction	2.06	9.43
Crude Oil and Products	11.70	35.72
Transport, Communications	7.01	27.56
Housing	1.26	2.92
Services	1.19	2.2
Capital Goods Import	3.75	
Govern. Trade exports	1.44	
Migrants Remitt.	3.81	
Change in Stocks	2.09	
Intermediate Imports	2.05	
Consumer Goods Imports	3.56	
Population	1.19	

[1] Sector growth rates are projected by sector from 1975-1978 data source prepared by M.O.P. for ILO mission - the agriculture growth was moved downward from annual 4.5 percent (real) to 2.5 percent based on expert opinion. Non Sectoral growth rates are official plan estimates except migrant remittances which is based on a World Bank estimate.

Table 5.5. Estimate of Employment (Based on Recent Trend) by Sector.

Sector	1976-84[1] recent annual growth rate percent	Employment 10^3		
		1976[2]	1984 no labor productivity gain	1984 50% productivity gain
Agriculture	2.5	4068	4963	4515
Mining	4.0	28	38	33
Petroleum	35.7	19	222	121
Manufacturing	5.8	1153	1810	1482
Electricity	7.6	47	85	66
Construction	9.4	480	989	735
Total Commodity Sectors	7.2	5795	8107	6951
Transport, Communication	27.6	414	2902	1858
Trade & Finance	4.8	1014	1480	1247
Total Distribution Sector	15.2	1429	4382	2906
Housing	2.2	145	173	159
Public Utilities	7.9	53	97	75
Social Services	2.2	2225	2648	2437
Total Services Sectors	2.3	2422	2918	2671
Grand Total	8.6	9646	15407	12527
Migrants		472	1800	

[1] Growth Rate based on 75-78 trend except agriculture which is taken at 2.5% and housing and services taken at population growth rate.

[2] M.O.P. Tables prepared for ILO mission.

5.2. Suggested Improvements

The models briefly reviewed in this work like most models, could be improved but given the limited skilled manpower available it is important to think through in advance any proposed changes rather than embarking on overly ambitious schemes only to end up with the all too typical half finished system.

To this end improvements might be classified as minor and major roughly corresponding to those that might require one to two man months of effort for minor or alternatively of one or more years for major changes. These comments are directed primarily to the EMM model.

Minor changes:

- prices should include the possibility of controlled levels for some consumer items
- a labor coefficient matrix could be added to give some indication of labor demands - this could be improved by some allowance for technical change
- introduce price response for subsidized and government sales to households

Major changes might include:

- redoing the basic SAM structure for 1980 with some changes in a number of entries
- having a labor market with supply and demand for a number of labor categories - it should also seek to model some institutional factors such as the rachet type of wage setting in the public sector and the relatively flexible wages in agriculture.
- a monetary sector to account for inflationary impact on prices
- dynamizing the model to allow for change in capital, (utilization levels, employment, land change and technical change)
- account for changes in the composition of income classes over time.
- include some of the overseas markets for labor (migrants) and commodities in the export and import accounts.

The issue arises whether these questions should be answered in the EMM framework or a new model devised. Given the expertise currently available it would seem that a combination of both should be used. It might be useful to call a conference or a short work shop on those engaged in model building together with representatives from planning and policy making units. Before the workshop a series of papers might be prepared and distributed on the following:

- current and recent modeling efforts
- software and hardware availability and limitations
- what are the relevant policy issues now and in the near term.
- How is planning done currently.

6. Data

Researchers, and modelers in particular, working in most countries, not just in the developing ones, invariably encounter serious data limitations. While many seem to have an insatiable appetite for data and their claims often have a certain degree of merit they often do not reflect resource constraints. In Egypt the situation is rather different from many developing countries. Here there are considerable resources employed in generating an abundance of raw data. However many of the agencies and ministries involved in the collection and

processing of data lack coordination. This often results in lack of uniform definitions, duplication or inefficiency of effort in the collection first and preparation of data. In this sector a few suggestions are offered. These are considered at a general level and then some specific issues are addressed for the more specialized needs of manpower planning at a more disaggregated level.

6.1. General Data Collection and Analysis

At the national level one might expect a detailed survey such as a population census only once every five or ten years. This would normally require about four years to prepare, execute and publish the data. While such results are useful and the coverage desirable they do not fulfil the needs of many planners and policy makers. These usually need more up to date data and are often willing to sacrifice coverage and some degree of statistical accuracy to that goal.

Similarly those with specific interest in one branch of the economy might like to coordinate or correlate their data with other branches. Thus someone analysing the demand for health services might like to see whether it is affected by agriculture cropping patterns or occupation of the household head. In the present institutional structure it would be necessary to mount a survey to include data on health services, cropping patterns, occupation, a rather costly and time consuming process. Some of this effort could be reduced by adopting a modular approach.

6.2. Modular Approach

One approach to overcoming or at least modifying, to some degree the timeliness and correlation problem is to use a modular approach:

- Thus a sample frame would be established and updated at say 5 year intervals. This would provide a code for each household. The sampling frame currently available is quite adequate in the meantime.

- Surveys with intermediate level (say around 0.1% to 1%) coverage would be run say every three years. These might include detailed employment, farm-survey, household consumption patterns and would have reasonably elaborate questionaires.

- Surveys with low level coverage (about 0.01%) coverage would be run regularly or when needed. Thus price information, employment, wage data, might be collected four times a year. The nutritional or health status surveys might be done one a year. These surveys could be carried out quickly for two principal reasons - low population coverage and a highly simplified questionaire with the minimum number of questions. However the value of these quick surveys would be increased enormously by using a uniform coding from the national frame. Thus the price data could be related to specific household consumption patterns without the necessity of updating the detailed questions of the household survey. It would provide up to date information on trends in the economy.

6.3. Data for Manpower Planning

For manpower planning there are a number of data needs. Again the volume of data collected and the effort put into this is substantial. The output again suffers from lack of coordination between a number of Ministries and agencies involved. The coverage seems very uneven particularly for construction sector and migrants.

Data collection might be organized along the lines suggested in the previous section:

- A relatively detailed employment survey at about three year intervals with intermediate level coverage (0.1 to 1% of households).

- Frequent low coverage (0.01%) surveys at shorter intervals, as much as 4 times a year, to obtain up to date information on trends and seasonal variations in employment, wages, prices, by sector, occupation and educational background. In designing these surveys occupation categories should be chosen to reflect possible targets for policies. For instance listing those in manufacturing is of limited use. To facilitate speed these surveys should have only a limited range of questions.

- Migrants are not adequately covered at the moment.Data is available on a small subgroup (about 10% to 20%) who go through official channels. This could be improved by some cooperation with the immigration authorities but many, who go overland, to Libia for example, will only be accounted for by a judicious household survey. A somewhat different approach is suggested in the recommendation (Section 7).

- While many types of data could be used to advantage preference for assigning limited resources should go to a number of key "holes" at present. These include data on capital utilization, investment in education at all levels, and overseas demand. The remaining area which creates some difficulty is the role of the armed forces in terms of where they recruit from and where they go after discharge. The quality of the data on wages, prices and employment need urgent attention.

7. Recommendations

This set of recommendations are based on a rather limited period of time in Egypt. Consequently they do not reflect as much as desirable the information needs of the policy makers in government nor the level of commitment that might be available for implementing such recommendations. To a large extent policy scenarios of interest will influence the data and modelling needs.

7.1. Data Needs

(1) The immediate data needs are to understand the present situation. This requires up to data reliable information on prices, wages and employment. The report suggests that this could be done in practice by adopting a modular approach. These surveys would be conducted about four times per year with limited population coverage and a short number of questions. This would expedite timely analysis. Such mini- surveys would be linked to more detailed (costly and time consuming) but less frequent surveys by using a common code. This would facilitate further analysis on the relationship to another level of variables. Thus one could achieve a compromise between the information needed quickly and that not required with the same degree of urgency. In view of the great volume of survey work currently performed much of this proposal could be achieved by realigning present personnel, standardizing definitions and analysis procedures rather than expanding the present effort.

(2) Additional data needs are for investment, supply, demand, and utilization, manpower supply, demand and utilization. Ideally this should be by sector, occupation and education group and also include migrants.

(3) The collection of data on migrants poses special problems. This arises primarily because most migrants perceive official channels as placing a burden on them and offering no advantage. One could encourage registration by offering them some incentive. One possibility could be to allow them to

join voluntarily some form of social security scheme. They would contribute to this out of their overseas earnings and then be eligible for some benefits on their return. The funds collected might be earmarked to provide better training opportunities.

(4) Data on behavioural patterns to answer such questions as; what people perceive as their employment needs (wage and non wage benefits) why they enter and proceed along current career lines and what it would take to change or alter these. This type of data could be useful if planners wanted some indication of the time lags involved in effecting change and the type of policies needed to target different groups.

(5) Most of the standard macro statistics need clarification and standardization, including measures of wages, employment, investment, price deflators, cost of living indices.

7.2. Model Building

Model building with manpower planning objectives could proceed in a number of ways. Again it should try to blend short and medium to long term goals. In order to produce useful results within a reasonable period of time the approach should be tailored largely to the availability of expertise currently available in Egypt. It would seem that a modular approach would have a number of advantages i.e. each module would produce results and everything would not be dependent on finalizing simply a model. However, in order to be efficient a number of common features should be agreed on, such as the skill categories, sectoral dissaggregation, exogenous parameters. There should also be some understanding of at least some of the policy issues to be addressed. Some of the more obvious submodels could be:

(1) Supply model: to analyse determinants of supply of various types of labor - this could be further disaggregated into analysis by particular sectors. Ideally it would be desirable to trace investment through to output and produce answers to questions such as what it costs to increase the supply of skilled machinists in the short and long term, what would happen if population growth fell by 25%, or certain arab countries had not any further employment opportunities.

(2) Demand Model: to analyse determinants of demand for various categories of labor by occupation and education both domestic and foreign. This could also be disaggregated by sector. One could analyse the impact of various growth scenarios and identify the role of uncertainty. This needs to include the role of quantity constraints and the implication of rationing.

(3) Supply-Demand Linkage: Analysis of how the market might clear - how disequilibria might be sustained - how alternate policy might affect the balance.

(4) Government and Public Sector: This poses particular problems for manpower planning as the various institutional arrangements are somewhat unique. This model should place particular emphasis on identifying and analysing underutilization of capital and labor and the special problems of allocation in this sector.

(5) Exports - Imports: The interaction of exports-imports with the domestic employment situation is important in an open economy like that of Egypt today. Imports are about 30% of GNP. A first step in modelling the labor impact would be to produce input-output tables to generate separate matrices for total input coefficients and domestic coefficients. The data for this is almost complete but needs to be put into this format.

(6) Macro Model: The model should be structured to start with a relatively aggregated level and then extended to include models proposed above. One possible structure would use a SAM framework similar to the EMM (GEM) model discussed in the report. The accounting identities in this approach provide a desirable check on the quality and consistency of some of the data. However it is important to improve the price and investment equations and introduce inflation and technical change. The model should also be dynamized.

The capability to develop and use a model of this form has already been demonstrated by Egyptians in Egypt.

(7) Concurrently a resource based approach similar to the DRM model could provide useful insights on the balance of payment problems.

One could aspire to combine 6 and 7 to provide estimates of resource requirements to meet policy goals. I would suggest that an early workshop might be held to discuss data and model issues along the lines suggested in the report. This would provide useful interface between planners, statisticians and policy makers who often have a limited perception of each others needs. It should also help to standardize definitions, choice of sectors and general thrust of the work.

Finally manpower planning should form an integral part of the Five Year and Annual plan operations to ensure that all Egyptians enjoy full and productive employment.

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