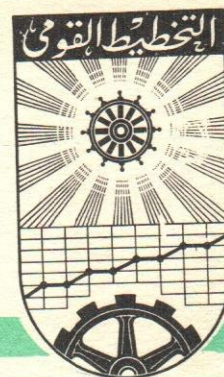


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Patterns of Industrialization and
The Choice of The Production Technique
In Developing Countries

By

Dr. Mandouh Fahmy El-Sharkawy

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Introduction

The term of industrialization is commonly used to note for the implementation of new industries and the expansion of existing ones.

Considering the case of the developing countries, the subject of industrialization has been received great importance from those who are interested in the field of economic thought.

Discussion on this subject have taken a relatively long time. They started by stressing on the structure of manufacturing industries and how far a suggested structure influences the social and economic conditions of the developing countries. The choice of the production technique aresed and received an increasing importance in the recently economic literature.

Many economic writers who dealt with the above two mentioned subjects came to certain conclusions and advised the developing countries to follow their recommendations. The latters are, sonetimes, based on the basis of a theoretical and mathematical models, some times, on the basis of experiences derived from the conditions of the presently industrialized countries. In most instances, those arguments do not lack any consistency in their theoretical or mathematical basis.. The reason, on one hand, is that they are supported by prevailing experiences of the developed countries. On the other hand, methematical models based on certain numerical assumptions treat the problem without taking into account fact that the success of industrialization depends on the role played by living labour which in itself is governed by how far industrialization contributes effectively towards satisfying its needs.

An examination of the arguments relating to the above mentioned two problems implies a deep analysis of numerous problems connected with them, which is hardly done in this paper.

Thus, the purpose of the present paper is to give some conclusions relating to certain problems connected with the foregoing mentioned two problems which are examined in the author's Ph.D. dissertation - after developing them - submitted to the Central School of planning and Statistics in Warsaw, 1973.

It has to be noted that, the author hopes to deal with the remaining ones after developing them. Thus, the door for further discussion of this subject is open.

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I. Some Factors Calling for Industrializations

1. Primary exports and its implications to Developing countries

One of the main features of developing countries is the heavy reliance on primary exports. While, in the year 1913 the developing countries who obtained more than 50% of their export receipts were no more than nineteen countries, in 1959-61 there were no less than twenty eight developing countries who get more than 60% of their export proceeds from three commodities.

The heavy dependence of developing countries on few major primary commodities is highly ever to provide them with a satisfactory basis of continuous economic growth because of the following reasons:-

a) The slow growth of exports

The slow growth of exports has been resulted from several factors, the most important among which are: a) there are series of innovations taking place in the highly industrialized countries which caused the demand for raw materials to diverge from the general level of activity. b) In most developed countries, substantial part of exports is carried out under a heavy policy of export subsidies. c) The prevalence of U.S.A. as a major world exporter of primary commodities has been depressed the expansion of competing primary exports produced by developing countries. Other than export subsidies, substantial quantities of U.S.A. farm products are sold under the export credit sales program of the commodity co-operation, PL 480. A sizable part of shipments under this law went to Europe. d) In the industrialized countries there is a considerable increase in the relative importance of industries producing chemicals and metal products. While the relative importance of industries which

are characterized by a relatively high shares of raw material inputs in final product, such as textiles, clothing, leather, ... etc, went on showing a considerable decline. e) Most developing countries have favoured the expansion of their own primary activities behind protective walls through the imposition of commercial policies. Others have also leaved internal fiscal changes which have tended to restrain the consumption several commodities produced largely by developing countries.

b) The deterioration in the terms of trade

Developing countries are suffering a great loss in their export receipts due to losses in their terms of trade. This is, not only, because of the sharp rise in the prices of their imports of manufactured products accompanied by a considerable decline in the prices of primary exports of primary commodities. But also, due to the rise in prices of agricultural food products exported by developed countries, as against a decline or, with an unequal rise in the prices of agricultural food products produced by developing countries. In most cases losses in the terms of trade of developing countries have compensated the inflow of foreign loans and aids to them.

c) The Fluctuations in the export proceeds

The prices of raw materials are subject to heavy fluctuations in world market than the prices of manufactured products. The reason is, the production factors engaged in producing primary products are not easily adjusted to the fluctuations in world demand. A rise in world prices of a certain commodity may cause an optimistic attitude among producers to increase their domestic production. On the other hand, if the prices of these commodities go down absolutely or relatively producers may not be able to give up production within a short time. Changes in weather conditions and crop diseases almostly cause random movements in yield of cultivated area. Producers may be falling short of or being large for world demand at the prevailing

prices. The prices of raw material are sensitive to incidental fluctuations. The prices of raw material exports are sensitive to incidental fluctuations. The well known examples were those connected with the Forean boom and Suez crises.

Where the programmes for economic development by the developing countries require that there must be a sufficient and steady flow of foreign exchange to finance the growing imports of capital goods, raw materials, semi-manufactured, etc., proceeds of primary exports are highly ever to provide a satisfactory basis of continuous development for these countries.

2) Per Capita Income

Per capita income is almostly used as a good yardstick in determining living standards of population. The present day evidence demonstrates that, there is a strong relationship between per capita income and the degree of industrialization.

4) The latter is measured by two indicators namely a) the sectoral origin of gross domestic product. b) the distribution of economically active population.

With regards to the former, in developing countries agricultural production accounts for 22 to 65 percent of total domestic output, while manufacturing industry contributes only about 15 to 21 percent. By contrast, in developed countries, these proportions are quite the reverse, manufacturing industry amounts 31% to 41%, while agriculture add only 3% to 13%.

As for as the distribution of economically active population among economic activities is considered, in the great majority of the developing countries more than 50 percent is engaged in agricultural sector,

While the proportion of those attached to manufacturing industry does not exceed 12 per cent.

The two mentioned factors demonstrate the fact that, low per capita income and a low degree of industrialization can, for all practical purposes, be taken as a co-existing phenomena.^{x)} The reasons for this are numerous, the most important of which are the following:

- a) The productivity of labour in agricultural sector is much lower than in manufacturing sector.
- b) Low labour productivity in agriculture is due, on one hand, to the lack of manufactured goods which would serve as incentive goods to farmers and primary producers to rationalize production and increase productivity*. On the other hand, it is due to the existence of disguised unemployment in this sector.
- c) The deterioration in the terms of trade of the developing countries is another factor responsible for low levels of living standards of population. This is so because a rise in national income of developing countries need not necessarily lead to an improvement in the economic situation of the population since a considerable part of the additional value produced is siphoned off by foreign countries, and very frequently the most advanced. **)

x) R.E. Helfgott and S. Schiavo-Campo, *AN Introduction to Industrial Planning*, in, *Industrialization And Productivity Bulletin*, no. 16. U.N., New York 1970, 0.6.

**) Ibid, P. 7.

***) J.N owichi, *Development theory of the less Advanced Economies*, The central school of Planning And Statistics(Teaching Material Vol...), Warsaw, 1969, pp. 70 , 71

3) The Problem of Employment

Most developing countries are facing an acute problem of employment. This is due, firstly to the supply of labour force. In most developing countries, birth and death rates are the strategic factors in determining the growth rate of the supply of labour. The countries under investigation are characterised by high birth rates. In the year 1966 birth rate was 4.1% in A. R.E. while in France, Italy, Japan and Poland this rate was about 1.8%, 2.0%, 1.4% and 1.7%, respectively.

The death rate, on the other hand, is a function of medical knowledge and technique and of the degree in which they are being used by the population, of nutrition, accommodation and sanitary conditions.^x Despite the fact that, the overall socio-economic cultural conditions of the developing countries make death rates much higher than those in the developed countries^{x x}) last years indicated a remarkable decrease in this rates. Thus, with the birth rates are remaining high, a reduction in death rates results in high growth rates of labour supply.

Secondly, agricultural sector is unable to create a sufficient number of employment opportunities because of the limits induced by the law of the optimum combination of the factorial proportions and the prevalent conditions on world market of primary commodities.

x) Ibid, p. 32.

x x) The corresponding rates of the five countries stated above in the same mentioned year were about 1.5%, 1.1%, 1.0%, 0.7% and 0.7%, respectively.

In the light of what has been stated before, one can say that, the ultimate good of industrialization is to realize the following:

- a- Solving the acute problem of unemployment.
- b- Raising the living standards of the populations through per capita consumption.
- c) Balancing the balance of payment, or inducing a significant changes in order to alleviate the prevailing chronic deficit. This has to be realized after considering the requirements of economic development.

II Patterns of Industrialization and Labour Productivity:

Most developing countries have low rates of accumulation. The secular relationship starts from the low income level to a limited capacity to save, hence to a shortage of capital, and so to low productivity. This circle emphasizes the fact that the capacity of developing countries to accumulate depends on initial increase in productivity and real income because the prevailing levels are too low to permit any significant margin of saving.

The roots of the device favouring the earlier development of producers industries go far to the argument which deals with the relationship between the degree of the capital intensity of investment and labour productivity. According to this argument, the higher is the degree of the capital intensity of investment, the higher will be the labour productivity. As a rule, most producers industries belong to this type of high degree of capital intensive forms of investment. Thus, the earlier development of these industries bring about high levels of labour productivity than consumers industries would. This helps increasing rates of accumulation, hence growth of income which in turn leads to an increase in real per capita income, and so to higher rate of accumulation.

In view of this, it is mentioned that, despite producers industries have an immediate minor effect towards increasing living standards of population and alleviating the acute problem of unemployment, it is the best if the long run horizon gains - measured in terms of employment and real increase in living standards of population - are considered.

Based on the experience of many developing countries - including A.R.E. - the above mentioned argument could not prove itself. The failure of such a device is due to the fact that, it is carried out on the basis of a singular factor which might be

called the pure technical factor derived from the experience of present day industrialized countries and neglect various significant factors influencing labour productivity, the most important of which are the following:

- A) Health conditions.
- B) The supply of Labour.

A) Health conditions

This factor includes physical conditions of workers and medical care extended to them.

The physical welfare of workers helps, not only reducing the number of working days lost on account of sickness, but also contributes effectively towards increasing their general efficiency at all working times. In this respect, the followings have to be emphasized.

a) The failure of most developing countries to reap immediate benefits of higher degree of capital intensity of investment in terms of higher labour productivity is due in part to the fact that workers are inadequately fed. Where the physical conditions of workers vary enormously between developing and developed countries, it is found that workers in developing countries achieve only a fraction of the daily output of developed country's worker with the similar equipment, even in jobs requiring no special industrial skill.

b) The widely varying nature of the two manufacturing industries as to working conditions, and to required physical conditions of workers also go far to explain the existing differences in labour productivity in developing countries.

c) In most producers industries, production processes are done under unpleasant working conditions. This would induce a deleterious effect on efficiency of workers, unless they are adequately fed to raise their physical resistance against those unpleasant conditions. The prevailing very modest level of quantities and qualities of per worker food consumption relating to the required minimum level of workers needs would seriously prevent

labour productivity to attain a satisfactory level as compared with developed countries or with installed capacity of employed machines. Thus, it is of urgent necessity to improve, firstly, living standards of population. This gives supports for the earlier development of consumers industries. In other words, the development of consumers industries helps increasing living standards of population which in turn create the basis for the development of producers industries.

Extended medical care is another factor which plays a significant role in determining levels of labour productivity. The relative importance of this factor varies from industry to another, and depends on the nature of working conditions.

In most producers industries, the risk of occupational disease because of exposure, to dusts and gases is quite high. This entails providing production units with a sufficient number of specialist staff of physicians, nurses, laboratory technicians, dentists, radio grapher, ... etc. Facts denote that most present day developing countries, mainly those at the initial stage of industrialization, are facing an acute shortage of these specialists, i.e. the available number of these specialists is not sufficient to cope with the increasing requirements of these industries.

B) The supply of labour force.

The efficiency of investment outlay - as measured in terms of labour productivity - clearly depends on the available supply of labour in relation to the requirements which are expected to arise from its intensity. This factor includes managers, technicians, foremen, and skilled workers.

Higher degree of capital intensity of investment requires large qualified numbers of the above mentioned categories, if labour productivity has to attain a satisfactory level. The reasons are numerous and includes the following:

a) Production processes of most producers industries are complex. Where industrial enterprise becomes larger and processes are complex, specialist tasks such as quality control, work study and production engineering are undertaken by separate departments. Due to the amalgamation of the factory into a single complex unit, line relationship will have to be replaced by further functional ones, and poor co-operation between departments and "empire building" will no longer be acceptable. Also, heavier capital investment will require large fixed outputs for profitable operations and inflexible manufacturing facilities, consequent on mechanization will call for a smaller margin of managerial error.^{x)}

b) In most producers industries, the factory comprises various separate production units, each unit includes a large number of parts, and each part deals with specific production process. The nature of the product produced by these industries is subject to chemical and firing processes. Under these conditions, producers industries require the existence of a large number of qualified maintenance workers and engineering staff capable of well understanding the complicated basis of employed machines.

c) Since producers industries require large number of skilled workers, technicians, and engineering, there should be a corresponding sufficient number of foremen to deal successfully with these different classes of skilled personnel and with each technical emergency.

Facts derived from developing countries - mainly those at the initial stage of industrialization - indicate that they are suffering an acute shortage of the adequate supply of labour force. This explains, firstly, the failure of producers industries to realize any satisfactory level of labour productivity as compared

x) J.D. Rodford & D.B. Richardson, The Management of Production, Macmillan & Co Ltd, New York, 1968, P.P. 7,8.