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Egypt: Transfer and Development of Industrial Technology

Analytical Study

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February 1998

In its widely acceptable concept, technology is best represented in a hierarchical form with regards its structure. It starts with simple technology of modest handicrafts, and rises to higher stages of the hierarchy using technologies, tools and skills that are compatible with its degree of elevation. The higher the standards of technology employed, the more it is characterized with instability and tendency to rise to a higher level using technological developments. This process is carried out through constant and diligent development that comes as a result to innovative human efforts of individuals and those who use technology for higher advancement. Global technology can only prosper and yield macro production through information database covering local and global interests.

For example; in case of the establishment of a factory for producing aluminum cans for carbonated beverages, one cannot choose the suitable technology needed for the proper production scale without the availability of an information database that replies to the following questions:

- a- Does local aluminum industry produce aluminum sheets needed for such industry?
- b- What is the starting date of producing aluminum sheets in the market?
What is the volume of this production?
- c- What is the current as well as expected consumption rates of aluminum cans in proportionate with the number of population and expected potentials of increase in this consumption in a yearly basis?

Technology cannot develop or flourish without an information database

There is a set of dynamic levels that govern technology. These levels start with transfer of technology, use of technology, assimilation of technology, development of technology and then the capability to assimilate technology.

Egypt witnessed numerous cases with respectable results for transfer, use, assimilation, innovation and development of technology. However, the prevailing feature was characterized with individual “micro” successes which contributed to the development of institutions that succeeded in achieving these objectives and reached international standards. Such a fact doesn't allow using stereotypical behavior to be generalized over the state “macro” level based on the mentioned cases of success.

Technology and Human Development:

Technological progress can never be based on technology transfer without being associated with a technical revival of human development that is capable of dealing with all levels of the hierarchy of technology. This necessitates a comprehensive scheme of interconnected elements starting with basic, intermediary and higher technical education. These stages should be closely connected to practical application and actual practice so as to be able to deal with different levels of technological techniques. Here there is should be a question about increasing number of fresh and old graduates of engineering faculties and institutes:

Do Faculties and Institutes of Engineering graduate engineers who meet the needs of industry? Are these engineers theoretically and practically qualified to perform this role?

To get a positive answer to this vital question, we won't need a lot of pondering and thinking. The global solution is introduced by the west in the form of engineering and technical education implemented in Germany and the United States, based on the following determinants:

- A- Codifying technical curricula.
- B- Qualifying teachers to perform these programs according to codified curricula.
- C- Establishing a neutral higher academic authority to accredit curricula as well as approve qualified teachers to teach the codified curricula.
- D- Holding engineering and technical education workshops and laboratories to meet the codifications of this purpose.
- E- Accrediting codified laboratories of the faculties and institutes.
- F- Accrediting certificates issued by the faculties and institutes to ensure credibility of these certificates and that they will be accepted both at home and abroad.

The necessity of accrediting technical university qualification according to global codifications

The Complementary Role of Engineering Syndicates and Universities and Institutes

It isn't strange that numerous markets are opposed to better change, on the pretext that such a step will discard generations that had previously attained education degrees but they no more fit modern systems. The answer to this question too can be detected in the systems applied in industrial countries. The role of technical syndicates is not confined to registering its member graduates but also to grant working engineers the right to be registered in the records of

the working engineers, provided that they receive practical academic and technical qualification. In this regard, syndicates should open the door for them to attend codified education programs through pertinent institutes and faculties.

This allows the change of specialization and comprehensive re-qualification according to the supply and demand mechanisms in the labor market of engineering, which consequently should provide appropriate and decisive solutions to the graduate unemployment crisis.

Qualification and re-qualification in the field of engineering is the role of engineering syndicates to deal with faculties of engineering and technical institutes

The need to develop and add new courses for engineering students

Undoubtedly, industry and its rapidly developing technologies need developmental actions that fit its increasing roles which will definitely lead to the adoption of some new patterns that are currently taught in universities and technical institutes in industrial countries. For example:

- A- Professional ethics
- B- Facilities and technical elements of factories
- C- Programs for machinery maintenance and production lines
- D- Rationalization of energy use
- E- Quality management and quality assurance
- F- Factory management
- G- Production of small and micro parts
- H- Programming and operating programmed equipment

- I- Dealing with information networks
- J- Industrial environment and preserving it internally and externally
- K- Industrial safety
- L- Other modern educational programs

The need to develop new engineering disciplines compatible with current stages and future aspirations in the field of industry:

- A- Power engineer
- B- Quality engineer
- C- Environmental engineer
- D- Economic engineer
- E- Food industry engineer
- F- Welding engineer
- G- Industrial Safety engineer

There are other professional disciplines needed by modern industrial renaissance.

Financing Transfer of Technology

Despite the recent surge achieved by the banking sector, which has had a great effect on industrial advancement, which is witnessed by the country and which has improved the State economic indicators, it (the banking sector) is still reluctant from participating in financing technology transfer. This issue requires a change in concepts so that technology can be easily transferred through strong channels and tributaries. This matter can be facilitated by the establishment of a national specialized technical institution to be consulted in

selecting the appropriate technology, its sources and the average cost of its different levels. It should provide strategically significant consultation to direct technology seekers to the authorities that provide this technology and be guided by previous cases.

Focusing on Small Industries

Unquestionably, the remaining elements of the Egyptian industrialization plan, which started in the 1960s, still include many aspects that can provide machineries to workshops that serve as a solid infrastructure for the rising small industries in light of the presence of a wide base of human resources of intermediate and above intermediate education.

The State should consider the implementation of a system that offers progressive incentives in order to provide workshops machinery in economical prices. This system can be gradual in terms of price and financing incentives according to the size of labor employed in these small industries. This is in addition to paying attention to providing workshops to these small industries in the new industrial cities. It should also provide technical services that may be difficult for small industries to provide on an autonomous basis. These services include designs, costs, repair and maintenance, enhancing technical quality and accuracy, providing raw materials using current accounts with deferred payment, advertisement services, packaging, and participation in exhibitions.

Undeniably, this will eliminate all obstacles impeding small industries, create a major leap that would incorporate huge numbers of labor and enhance their technical and social standards, set the basic infrastructure for establishing feeding industries, and found the first stratum of the hierarchy on which the rest

of stages of technology utilization will be built in preparation for assimilating technology and developing it later on.

Guarantees of Technology Transfer

The process of transferring and importing modern technologies require a high degree of confidence by the countries and bodies that supplying technology in an atmosphere governing the political and economic practices in Egypt.

The Egyptian government has emphasized in several occasions that there would never be another nationalization policy. It has recently issued an investment protection law and made great facilities and exemptions to investment and industrial projects. However, the protection of intellectual property rights in Egypt and its applications are still lagging behind global standards in industrial countries.

This requires a well-considered stance to achieve development and rapid fulfillment of intellectual property rights laws and counter fraud, illegal reproduction and plagiarizing to reassure technology suppliers that their technology will not be misused, and existing national industries that they would not be harmed before they complete their credentials of strength and self sufficiency.